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The determinants of fixed-term contracts in contemporary Switzerland

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Summary

This paper focuses on the determinants of fixed-term contracts in Switzerland, using data coming from four waves (2004-2007) of the Swiss Household Panel (SHP). The analysis shows that fixed- term contracts are correlated to the type of education. In particular, the subjects who have undergone non-vocational training courses have a lower chance of obtaining a contract of an undetermined duration (hereafter referred to as a "permanent contract"). Other factors capable of increasing the chances of having a fixed-term contract are: being a woman or belonging to the younger cohorts. Apart from work experience (or also the ageing process), the fact of living in a couple with children increases the chances of having a permanent contract.

1.　Introduction

According to the OECD (2005), Switzerland belongs to a group of countries where the Employment Protection Legislation (EPL), measured through a composite index, is relatively more flexible. This flexibility is due to a number of reasons, but most importantly, the Swiss labour market contains fewer regulations than other countries, leaving significant room for individual negotiation (BÖRSCH, 2007; EMMENEGGER, 2009; GERFIN and LECHNER, 2002). In other words, using the terminology proposed by WILTHAGEN and TROS (2004), the OECD confirms that Switzerland possesses an elevated external numerical flexibility, i.e. the possibility of adjusting the number of employees to the economic conditions by firing and hiring (on either a permanent or a temporary basis) according to these conditions.[1] As shown by WILTHAGEN and TROS (2004), in formalizing a precise typology of the forms of flexibility from the point of view of the employer, and in distinguishing between flexibility both internal and external to the company, as well as between numerical and functional flexibility:

- external numerical flexibility results in the simplicity of the hiring and firing of workers and the diffusion of fixed-term or temporary contracts;

- internal numerical flexibility indicates the ease of modifying the amount of work for employees of the firm, without recourse to formal modifications of the relationship between employer and employees (hiring or firing), but rather through variations of working hours, or recourse to overtime or part-time work;

- functional internal flexibility allows the company to move its workers from one task to another, or to modify the job descriptions of its employees;

- flexibility of salary permits salary revisions according to changes in economic conditions, productivity, or the current competitiveness of the company.

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[1] For a criticism of the approach of OECD and of the use of the composite indicator of the strictness of employment protection legislation (EPL), see SEIFERT and TANGIAN (2007).

To these four types of flexibility may be added external functional flexibility, which allows the possibility of the firm commissioning some tasks to external workers without the necessity of having recourse to employment contracts, but exclusively through commercial contracts in the form of the out-sourcing of certain tasks (TANGIAN, 2006; SEIFERT and TANGIAN, 2007).

This article intends to analyze only one dimension of flexibility in Switzerland, which is the contractual aspect.[2] More precisely, the article proposes to contribute to a greater understanding of external numerical flexibility by analysing the relationships which exist between the type of training (vocational or generalized) and the type of employment contract, i.e., fixed-term contract[3] and permanent contract.

The article is structured as follows: First of all we present a brief overview of the main theoretical approaches to the issue of fixed-term contracts, followed by our own research hypotheses. Then we present the data and variables used, the model design and the results of descriptive and inferential analysis. Finally, in a brief conclusion we summarize the importance of our results and propose further topics of investigation.

2.   Theory and Previous Research

With regard to fixed-term contracts, we face two approaches (MCGINNITY, MERTENS and GUNDERT, 2005): one regards the employment of workers on fixed-term contracts as a "bridge" to permanent employment, whereas the other considers it as a "trap" which either extends this kind of employment relationship over the long term or leads to a continuing oscillating movement between temporary employment conditions and unemployed status.[4] The first approach essentially means that fixed-term employment acts positively towards permanent employment. As discussed by some authors (ICHINO, MEALLI and NANNICINI, 2005), this happens in two ways: first, on the employers' side, through the possibilities

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[2] For a general analysis of the forms of flexibility and their evolution, as well as their relationship with the social security system in Switzerland, refer to ECOPLAN (2007) and BÖHRINGER (2001).

[3] In this article, employees who do not have a permanent contract are considered temporarily employed. In this sense, fixed-term contracts and temporary contracts are considered as synonymous.

[4] Among the first to compare bridge and trap were BÜCHTEMANN and QUACK (1989). See also MCGINNITY AND MERTENS (2002). Naturally, it should be restated that choosing a job with a fixed-term contract for long periods, perhaps for years, could be dictated by a preference for flexibility. Such a preference might be expressed, for example, by those people who, as in Germany, spontaneously decide to leave their jobs, and therefore are not eligible for unemployment benefits.

offered by fixed-term contracts to observe and select employees, and second, on the employees' side, through the acquisition of human capital, social contacts and information on job vacancies in the company. The fixed-term contract therefore would act as a bridge towards a permanent contract. The importance of fixed-term contracts as a way of access to permanent employment is strongly related to the fact that companies use them as a tool for *screening* their employees and not as a pure (external) flexibility device for dealing with difficult business cycles.

The second approach, as pointed out by MCGINNITY, MERTENS and GUNDERT (2005), sees fixed-term employment as having worse employment conditions and poorer career prospects than permanent employment. A part of the workforce remains trapped in a continual coming and going between the condition of unemployment and that of fixed-term employment: this is the structured effect ("Struktureffekt") noted by SENGENBERGER (1987) in Germany. This effect is particularly present in countries where the labour market is strictly regulated and segmented (GASH, 2008).

In the more general formulation of the theory of segmentation (DOERINGER and PIORE, 1971), the labour market is divided into a primary segment and a secondary segment. Within the primary segment, jobs are secure and stable, the working conditions are generally favorable, career prospects are good, and salaries are high. The secondary segment has opposing characteristics: salaries are lower, working conditions are less favorable, employment is unstable, and there are few career prospects. As MCGINNITY, MERTENS and GUNDERT (2005, P. 362) point out, if the principle aim of employers who employ workers with fixed-term contracts is to have a margin of external numerical flexibility in order to be able to respond to market demand fluctuations in the short term, one should be able to ascertain a relationship between fixed-term contracts and low skills. It follows that fixed-term contracts should be found mainly among those who enter the labour market with low skills. These workers tend to have intermittent employment, unstable careers, and will be at greater risk of unemployment with respect to those who have entered the labour market with permanent contracts.

From the analysis carried out by SOUSA-POZA (2004) with data from the Swiss Labour Force Survey (SLFS), the existence of a secondary segment in Switzerland is not confirmed. Nevertheless, the same author emphasizes that the characterization of a segmented labour market depends on the chosen method of analysis, and on the definition of these segments. In fact, some authors underline the existence of segregation by gender and ethnic origin (MEYER, 2006), while as for types of contract, markedly those for a limited time, the question remains open and not wholly resolved. On the other hand, numerous studies seem to confirm the bridge theory for Switzerland. SALLADARRE and HLAIMI (2007), analyzing the determinants of temporary employment in 19 European countries (including Switzerland), and using data from the European Social Survey (ESS),

conclude that fixed-term employment appears connected with age, which supports the idea that temporary employment seems to become the stepping stone to permanent jobs. ENGELLANDT and RIPHAHN (2005), using data from the Swiss Labour Force Survey (SLFS), find that in Switzerland the period-to-period probability of leaving temporary employment for a permanent job amounts to 26%, while the reverse probability of leaving permanent employment for a temporary job is low at 0.9%. HENNEBERGER et al. (2004) demonstrate, on the basis of data from the Swiss Household Panel (SHP), that in Switzerland there exists a significant mobility from fixed-term forms of employment to those of a permanent nature, despite some episodes of the persistence of the phenomenon of segmentation. HENNEBERGER et al. (2004) have also demonstrated the existence of a relationship between age, qualifications and fixed-term contracts. These last would appear to be found principally among young people and those of an advanced age, and among young people with high qualifications. The link between fixed-term contracts and young people with a higher education (Universities, Institutes of Technology and Universities of Applied Sciences) would seem to corroborate both the *bridge theory* and that of *screening*, which is a special case (MCGINNITY, MERTENS and GUNDERT, 2005) rather than one of entrapment. According to BIRCHMEIER (2002), it would be just this high proportion of fixed-term contracts observed in academic professions that suggests that it is especially highly qualified workers and those with university qualifications who accept such contractual relationships. This comes about because, according to Birchmeier, the projects in which such workers collaborate often have a limited duration, or because these workers expect to use such work experiences as a springboard for their professional careers. However, as for the incidence of fixed-term contracts among those workers over 50 years of age, there is not yet a solid explanation. According to HENNEBERGER et al. (2004), the explanation could come from the greater instability of the employment patterns of senior workers, which would tend to deter the company from investing in the human capital associated with this type of worker. This would make senior workers more inclined to accept fixed-term contracts. Moreover, the difficulties that workers of this advanced-age group encounter in finding a new job after having lost their old one would further contribute to their inclination to accept a fixed-term contract.

From the topic literature, it is worth specifying that in Switzerland, even jobs of an undetermined duration ("regular") are becoming more flexible or "eroded" (DIEKMANN and JANN, 2004). The labour market is not strictly regulated, and therefore even permanent contracts are not very binding, and tend to converge more towards the conditions of a fixed-term contract (BRUNNER-PATTHEY, 2007; ENGELLANDT and RIPHAHN, 2005).

For employers, therefore, fixed-term contracts are less attractive in Switzerland than in countries where the labour market is more "protected" through permanent contracts.[5] Nevertheless, such contracts offer a concrete opportunity to employers to carry out a *screening* during a more or less extended trial period, then employing, on a more permanent basis, those who have shown themselves to be the most productive and promising (BARANOWSKA and GEBEL, 2008). Fixed-term contracts allow employers to gather information relating to ability which is not available before hiring. This monitoring could only take place relatively late for those who possess university qualifications. For this reason it is logical to expect a greater incidence of subjects with advanced skills and university educations among fixed-term wage earners.[6] Moreover, workers with high qualifications need extended trial periods "because their performance requires longer screening" (MCGINNITY, MERTENS and GUNDERT, 2005, p. 363). Less qualified workers, however, either do not require long-term monitoring in order to acquire a permanent contract, or have previously acquired such a contract, or continue working with a fixed-term contract, or continue working in an unstable, sporadic way. Yet, there is another element to consider. In Switzerland there are two categories of skilled people: those with higher vocational education and training (Advanced Federal Certificate and Federal Diploma of Higher Vocational Education and Training (VET), or with a diploma from a college of higher VET); and those with vocational education and training acquired during an in-company apprenticeship (Basic Federal Certificate of Vocational Education and Training of two years and Federal Certificate of Vocational Education and Training of three or four years). Together, these types of training play a central role in the post-compulsory part of the Swiss educational system and constitute the main pillar of Swiss (respectively) Tertiary and Upper Secondary education (MEYER, 2006, p. 4). These two categories of skilled people have the opportunity of being monitored earlier compared to people with university qualifications. In particular, "[a]pprenticeship" – i.e. Upper Secondary level – "is not primarily seen as a way of providing for all those who leave school with modest or low academic grades. For the lowest attainers there are other preparatory courses or work-based programs" (STEEDMAN, 2005, p. 4). In Switzerland, in-company apprenticeship is quite widespread (MUEHLEMANN, WOLTERS, WÜEST, 2009), being embedded in the educational system (LEVY, 2009; MEYER, 2006) upon which part of the flexibility of the Swiss labour market depends.[7]

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[5] POLAVIEJA (2005) e.g., has demonstrated that the levels of employment protection of workers on standard contracts and the degree of coordination and centralization of collective bargaining systems are two main variables driving the distribution of temporary employment in advanced economies.
[6] See GASH (2008, P. 652).
[7] Using pooled data (waves 1999-2007) from the Swiss Household Panel (SHP), the percentage of fixed-term contracts in the labour force, including the apprentices and all the subjects under 21 years who work, is 12.7%, while excluding such categories, the percentage drops to 6%.

Given the resemblance of the Swiss VET system to that of Germany, it would be reasonable to expect a high number of workers with vocational training (apprentice diploma) among the employed with fixed-term contracts. Indeed, the literature reports how fixed-term/apprenticeship contracts in Germany represent a mechanism of adjustment to the macroeconomic shocks with relatively low conversion rates in permanent contracts, and an elevated risk of unemployment at the expiration of the contract (BARBIERI, 2009, p.4). Germany, however, although having an apprenticeship system similar to that of Switzerland, has a more regulated and segmented labour market (GASH, 2008), and relatively high apprenticeship costs for employers (DIONISIUS et al., 2008). Conversely, DIONISIUS et al. (2008), using firm level data, maintain that in Switzerland companies are efficient and manage to recover training costs through the productive employment of apprentices during training. In general, "[i]n-firm training comes at a cost for the employer; however, in Switzerland firms can generate a benefit from the productive contribution of apprentices, which on average outweighs the training expenditures" (WOLTER, MUEHLEMANN and SCHWERI, 2006).

A further advantage of apprenticeship for employers is that they can keep screening costs low. Apprentices could more easily be allowed to enter the labour market with a permanent contract, or to sign a contract within a short time, without a long trial period in which to demonstrate their abilities, given that they have already been monitored in companies during training and certified by a third party. Some studies seem to support this hypothesis. According to WALTHER, SCHWERI and WOLTER (2005, p. 253), for example, apprenticeship in Switzerland is of very good quality and, compared with other European countries such as Germany, guaranties a relatively easy entrance to the labour market to young people after their apprenticeship. Still, this depends on the general conditions of the labour market, and in the future it will be necessary to understand the repercussions of the present economic crisis on the possibility of employment for apprentices. MEYER (2006), for example, emphasizes that, on the basis of the Swiss Youth Panel Survey TREE (Transitions from Education to Employment), the "[t]ransition to labour market after graduating from (Upper secondary) VET has become clearly more difficult".

3.   Research Hypothesis

The importance of fixed-term contracts as a way of access to permanent employment is strongly related to the fact that companies use them as a tool for *screening* their employees and not as a pure flexibility device for overcoming difficult business cycle

stages. The effects of fixed-term contracts are strongly dependent on the political and institutional context, while the interactions between this context and the use of fixed-term employment in large part determine the effects on permanent employment. Nevertheless, the scope of our analysis is limited: our interest is in quantifying the proportion of subjects among wage earners with a fixed-term contract, and describing the changes in this parameter within social groups constructed on the basis of some important factors of heterogeneity, primarily educational qualifications, but also age, gender, social origin, area of residence, family type, and nationality .

Our hypothesis is that the division between flexible and non-flexible workers is largely a phenomenon limited to the young age groups and the type of education undergone. More specifically, those in possession of credentials which include education or specialized skills acquired through training or apprenticeship should have more chances of finding permanent work than their peers in possession of educational credentials that certify a general preparation. In other words, access to positions of permanent contract is largely due to the type of education rather than to the number of years of education.

If our hypothesis is reinforced by empirical evidence, it follows that the screening process, where highly-educated workers receive a fixed-term contract because their ability needs to be tracked longer, would be more appropriate in describing the phenomenon of labour market flexibility in present-day Switzerland than the approach of the theory of segmentation, where less educated workers receive a fixed-term contract because their positions are in the secondary labour market segment.

In the following pages, a bivariate analysis will highlight the link between the propensity to have a fixed-term contract and some important social factors. It will be followed by an estimation of the effect of the type of education achieved through advanced statistical models, controlling for potential spurious or confounding factors such as gender, age, social origin, region of residence, family type and nationality.

4.   Data and Variables

We use data obtained by pooling four waves (2004-2007) of the Swiss Household Panel Survey (SHP). The SHP survey contains 11,643 households of which 5,074 were selected on the occasion of the first wave, and the remaining 6,569 were added in 2004 (refreshment sample).

In order to have more observations, we haven't extended the temporal window of observation from 1999, but instead we have selected a balanced sample of 2,698 subjects

aged between 21 and 61 years in wave 2004, who were observed until wave 2007 and were employed on the basis of a fixed-term or a permanent contract in the twelve months preceding the interview. Self-employed, unemployed, apprentices, inactive people and workers in training schemes or those people who had not yet completed their schooling have therefore been excluded from the analysis.[8]

Our dependent phenomenon is described by a dummy variable with these categories: 'having a fixed-term contract (1) rather than having a permanent one (0)'. Although we will comment on the association between some factors of heterogeneity widely noted in the literature which are presumed to have a structuring effect – gender, area of residence, nationality, social class, type of family, year of the survey – our principal concern is to correctly estimate the effect of the type of education on the probability of having a fixed-term contract.

In the descriptive analysis[9], on the one hand, 'age' is considered as a time varying covariate which has been coded into five categories – from 20 to 29, 30 to 39, 40 to 49, 50 to 59, and 60 to 64 years – so as to bring to light the existence of possible non-linear relationships.

On the other hand, in the logit models the age of the subject has been specified at the time of the first observation (wave 2004). Since the age at the first wave is a time constant covariate, it follows that it captures a cohort effect. In addition, in order to take into account a possible curvature, another covariate, expressing the square of the cohort covariate, has been introduced into the model.

The variable 'education' was coded so as to take into account not only years of education but also the type of education received by distinguishing between 'vocationalization' and 'educationalization' or 'generalization' tracks. More specifically, we have five categories for the variable 'education':

- the first category aggregates 'compulsory school', 'incomplete compulsory school' and 'elementary vocational';

- the second category (VET) aggregates 'domestic science course', 'one-year school', 'general training school', 'apprenticeship' and 'full-time vocational school'. This second category mainly corresponds to the vocational education and training level, i.e. Basic Federal Certificate of Vocational Education and Training (two years) and Federal Certificate of Vocational Education and Training (three or four years), to which have been added the subjects having a low level of education but

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[8] See the previous footnote.
[9] See Table 1.

who have nonetheless completed compulsory education, for example those who have attended courses to bridge gaps in training;

- the third category includes 'Bachelor/Maturity', i.e. subjects with Professional Baccalaureate and Academic Baccalaureate;

- the fourth category (higher VET) groups together for the most part 'vocational high school with master certificate', 'technical or vocational school', 'vocational high school', that is, subjects with a Higher Vocational Education and Training level, i.e. subjects with Advanced Federal Certificate and Federal Diploma of Higher VET and subjects who attended Colleges of Higher Vocational Education and Training;

- finally, the fifth category includes 'university and academic high school', specifically the university level (Universities, Institutes of Technology and Universities of Applied Sciences).[10]

The other covariates of interest that we check as potential confounders or spurious factors are:

- survey wave coded as a categorical variable where each category expresses the year of data collection. In the regression models we have specified three dummies (wave 2005, wave 2006, wave 2007) that can be considered as a proxy of a temporal predictor or, more simply, they capture the process of ageing of the subjects;

- region of residence, with the following categories: 'Lake Geneva', 'Middleland', 'North-West Switzerland', 'Zurich', 'East Switzerland', 'Central Switzerland' and 'Ticino';

- nationality, coded as a dummy variable with the following categories: 'Swiss nationality' and 'foreign nationality';

- class of origin of the father of the subject, coded according to the Erikson-Goldthorpe social class schema[11], which includes the following categories: 'actively employed but not classified and inapplicable', 'higher controllers', 'lower controllers', 'routine non-manual', 'self-employed with employees and self-employed with no employees', 'manual supervision', 'skilled manual', 'semi- and unskilled manual and farm labour', 'self-employed farmer';

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[10] See LEVY (2009) for an analogous categorization. For a schematic overview of the Swiss educational system see Meyer (2006).
[11] For a presentation and a reassessment see OESCH (2003).

- type of family, coded in five categories: 'single', 'couple without children', 'couple with children', 'one parent with children' and 'other types of family'.

Since we are working with a balanced sample, each individual appears in the dataset in four occasions or repeated measurements. We have excluded all workers on training schemes or in apprenticeship[12], the self-employed and those who have not yet completed their schooling.

5. Statistical Analysis and Model Designs

Before running statistical models, we present some bivariate analysis in order to shed light on some important observable factors of heterogeneity which could exert a significant influence on our dependent variable. More specifically, we will estimate the proportion of subjects in temporary jobs (with 95% confidence intervals) within groups formed on the basis of type of education, gender, age, nationality, type of family, social class of origin, and wave.

Subsequently, we will estimate models for longitudinal binary data – a random effects logistic model and a generalized estimating equation (GEE) – in order to explain the propensity to have a fixed-term contract as a function of the observed independent variables previously cited. Since longitudinal data can be viewed as two-level data with occasions (t) nested into subjects, with such models we are able to correct for the biases in standard errors of parameter estimates resulting from the clustering of repeated measurements within individuals (SKRONDAL and RABE-HESKETH, 2004).

In order to relax the assumption of conditional independence among the occasions for the same individual, we include a subject-specific random intercept in the linear predictor. Our logistic random intercept model expresses the *logit* of the probability for individual *i* at occasion *t* of having a fixed-term contract as a linear function of independent variables $\mathbf{x}_{ti}$ and a random subject-dependent deviation ζ_i,

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[12] As happens in Germany, "apprenticeships are counted as part of the training system and not as employment contracts" (MCGINNITY, MERTENS, GUNDERT, 2005, p. 360).

$$\log it\{\Pr(\mathrm{y}_{ti} = 1 \mid \mathbf{x}_{ti}, \zeta_i)\} = \beta_0 + \sum_{k=1}^{p} \beta_k x_{ti} + \zeta_i \qquad (1)$$

with $\zeta_i \mid \mathbf{x}_{ti} \sim \mathrm{N}(0, \psi)$ and ζ_i independent across subjects *i*.

The model assumes that, given $y_{ti} \equiv \Pr(\mathrm{y}_{ti} \mid x_{ti}, \zeta_i)$, y_{ti} are independently distributed as $y_{ti} \mid \pi_{ti} \sim \mathrm{binomial}(1, \pi_{ti})$;

$\mathbf{x}_{ti}$ is a vector of substantive covariates.

By allowing the intercept to vary between individuals, we can quantify the combined effects of omitted subject-specific covariates (observable or not observable) which increase or decrease the tendency to have a fixed-term contract.[13]

This kind of multilevel model for binary outcomes gives us the possibility of predicting the log odds of having a fixed-term contract rather than a permanent one for an individual, conditional on a set of time constant and time varying covariates and its own latent underlying 'propensity' to experience a specific outcome.[14]

A convenient summary of individual heterogeneity is the intra unit correlation ρ, which is a measure of residual correlation between two repeated observations referred to the same individual:

$$\rho = \frac{\sigma_\zeta^2}{\sigma_\zeta^2 + \sigma_e^2} \qquad (2)$$

where $\sigma_e^2 = \pi^2 / 3$ is the variance of the standard logistic distribution.

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[13] Our longitudinal panel models are fitted using the software package STATA.
[14] "So any direct interpretation is dependent on the assumption that the effect of interest is a constant conditional on an
unobservable random component" (CARLIN et al., 2001).

Next we develop a generalized estimating equation (GEE) where within-subject dependence is modelled by allowing a direct specification of the covariance structure across occasions. With GEE we estimate marginal or population-average effects, taking into account the dependence among units nested in clusters.[15] Since the coefficient estimates expressed in *logit* scale are not easy to interpret, we have also computed the Average Partial Effects for the GEE model. These latter are easier to interpret since they express differences, quantified in percentage points, in the average probability referred to the categories of independent variables of interest.[16]

6.   Descriptive Analysis

Table 1 shows the results of bivariate statistics calculated from repeated occasions rather than individuals, in such a way as to get a description of the phenomenon on a time window of observation of four years. First of all, the proportion of employees with a fixed-term contract is about 5%. Considering a confidence interval at 95%, the population parameter would be placed between 4.36% and 5.70%.

As previously stated, a crucial variable for our analysis, to which we will attribute the status of causal variable in the models which will follow, is the formal educational qualifications obtained by individuals. 'Bachelor/Maturity' qualification and 'University and Academic High School' certificate have a significantly higher probability of contributing to a fixed-term contract (respectively 11.39% and 9.73%). On the contrary, 'compulsory, incomplete compulsory and elementary vocational' and, even more marked, 'technical or vocational school', 'vocational high school', such as 'apprenticeship' and 'full-time vocational school', considerably increase the chances of having a permanent contract. To summarize, individuals with VET and higher VET have a probability of 2.43% and 3.43% respectively of signing a fixed-term contract.

As expected, age is a predictor of crucial importance too. The proportion of subjects with fixed-term contracts exceeds 7% in the group of younger subjects (20-29 years), declines to 5.28% in the group of people in their thirties, to 4.29% in the group of people in their

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[15] As regards the "working correlations" for the observed responses, we specify the option of the same correlation for all pairs of units (exchangeable structure).

[16] Generalized estimating equation (GEE) and multilevel logit for binary outcomes give generally similar results, even
though the GEE method is preferable because of its explicit allowance for intra subject correlation (Carlin et al. 2001).

forties, goes up to 4.77% in the group of people in their fifties, and finally reaches 5.96% among those who are 60 to 64 years old. Hence, the effect of age on the probability of having a fixed-term contract follows a U-shaped progression.

On average, women show a tendency of about 1.8 percentage points higher than men to signing fixed-term contracts. This result appears to be in line with what is happening in several other European countries where temporary employment seems to be more common for women than for men.[17]

Between 2004 and 2007, the proportion of subjects with fixed-term contracts fluctuates according to a serpentine pattern: it decreases by 0.87 percentage points in 2005, recovers in 2006 reaching 5.02% and declines by 0.83 percentage points in 2007.

'Central Switzerland' and 'Lake Geneva' are the regions with the highest spread of fixed-term contracts, with respectively 7.33% and 6.30%. The region 'Middleland' lags behind with a proportion of 4.18%. This could be proof that the distribution of fixed-term contracts is not connected to the productive characteristics of the region. In other words, it would be further proof of the inadequacy of the theory of segmentation.

Foreign people have a higher probability of having a fixed-term contract (almost 1.5 percentage points with respect to people with Swiss nationality), while being in a couple with children decreases the probability of temporary employment (1.83 percentage points less than single people).

Looking at the social origin, we are surprised to find that sons of higher social classes (higher and lower controllers) are more at risk of being in a temporary job than sons of skilled and unskilled manual workers and self-employed farmers.

Table 1: Proportion (%) of people with a fixed-term contract within groups formed on the basis of some heterogeneity factors. Unbalanced sample with 8,847 observations and standard error adjusted for 2,698 subjects (no weighted results).

Heterogeneity factors	Proportion fixed-term	Robust Std. Err.	[95%Conf. Interval]	
Age groups				
age 20-29	7.78%	1.40%	5.04%	10.52%
age 30-39	5.28%	0.60%	4.11%	6.45%
age 40-49	4.29%	0.51%	3.28%	5.30%
age 50-59	4.77%	0.68%	3.44%	6.11%
age 60-64	5.96%	1.69%	2.64%	9.28%

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[17] We refer in particular to the analysis made by SALLADARRE and HLAIMI (2007) using ESS data on 19 countries, i.e Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, The Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

(Table 1 continued)

Type & Level of Education

Compulsory, incomplete compulsory, elementary vocational Domestic science course, 1 year school, general training school,+	5.68%	1.36%	3.01%	8.35%
Apprenticeship, full-time vocational school (VET)	2.43%	0.31%	1.82%	3.04%
Bachelor/maturity Vocational high school with master certificate, +	11.39%	1.75%	7.96%	14.82%
Technical or vocational school, vocational high school (higher VET)	3.43%	0.58%	2.29%	4.56%
University and academic high school	9.73%	1.13%	7.52%	11.94%
Gender				
Man	4.11%	0.44%	3.25%	4.97%
Woman	5.96%	0.53%	4.93%	7.00%
Wave Survey				
wave 2004	5.79%	0.48%	4.85%	6.73%
wave 2005	4.92%	0.45%	4.03%	5.80%
wave 2006	5.02%	0.45%	4.14%	5.90%
wave 2007	4.19%	0.47%	3.26%	5.11%
Region of Residence				
Lake Geneva	6.30%	0.93%	4.48%	8.13%
Middleland	4.18%	0.65%	2.90%	5.45%
North-West Switzerland	4.20%	0.82%	2.59%	5.81%
Zurich	4.95%	0.76%	3.47%	6.43%
East Switzerland	4.23%	0.84%	2.57%	5.89%
Central Switzerland	7.33%	1.39%	4.62%	10.05%
Ticino	5.36%	1.90%	1.63%	9.09%
Nationality				
Switzerland nationality	4.87%	0.36%	4.16%	5.57%
Foreigner nationality	6.39%	1.14%	4.15%	8.63%
Type of Family				
Single	6.46%	0.97%	4.56%	8.37%
coupe no kids	4.91%	0.66%	3.62%	6.20%
couple with kids	4.63%	0.45%	3.75%	5.51%
one parent with kids	5.22%	1.12%	3.02%	7.43%
other types	5.88%	3.45%	0.89%	12.66%
Goldthorpes class schema: father main job				
Active occupied but not classified & inapplicable	5.53%	1.04%	3.50%	7.56%
Higher controllers	7.67%	1.05%	5.60%	9.74%
Low controllers	6.48%	1.01%	4.51%	8.46%
Routine non-manual	3.55%	1.27%	1.06%	6.05%
Self employed with & without employees	3.42%	0.80%	1.84%	4.99%
Manual supervision	3.13%	1.20%	0.78%	5.48%
Skilled manual	3.72%	0.75%	2.26%	5.19%
Semi and unskilled manual & farm labor	3.97%	0.79%	2.42%	5.52%
Self employed farm	3.91%	0.99%	1.96%	5.85%
parameter estimate referred to entire population	5.03%	0.34%	4.36%	5.70%

number of obs=8847
(Std.Err. adjusted for 2698 cluster in idpers)
Source: Our elaboration on Swiss Household Panel data

7.   Models for Longitudinal Data

The next step is the development of logit models designed specifically for longitudinal data. The first one is the logistic random intercept model with constant providing log odds of being in a temporary job for the category of reference, that is a man, with the age of 21 at the time of the first observation (wave 2004), with the lowest level of education, living in the region of 'Lake Geneva', with Swiss nationality, single and with a father who is employed but not classified according to the Goldthorpe and Erikson social class scheme.

Looking at the parameter estimates, we have found that the propensity to have a fixed-term contract appears to be significantly lower for people having a VET qualification, while subjects having a Bachelor/Maturity qualification (0.824) or university level qualification (0.807) show a relatively higher propensity compared to the reference category, even though these parameters are not statistically significant.

Such results confirm what has already been indicated in the theoretical section and foreseen in the descriptive table: in Switzerland, there exists a relatively flexible labour market, in the sense specified in the introduction of this paper, but without significant traces of segmentation. Unlike what happens in other European countries, in Switzerland fixed-term contracts are not structured on the basis of low educational credentials. Rather, it is those in possession of low educational credentials, but with VET qualification, who have the greatest chance of obtaining a permanent contract.

Looking at the other regression coefficients, we can see that for every one unit increase in the cohort predictor the logarithmic chance of being in a temporary job falls on average by 0.128, while the quadratic cohort predictor shows a positive sign, that is to say a positive curvature. In other words, our results show that the propensity to have a fixed-term contract decreases with the age observed at the first wave, although it does take a quadratic form which suggests a slower decrease as the cohort increases.

Another fact worthy of consideration is that in the fourth wave, or after four years of observation,   the chances of having a fixed-term contract decrease significantly (-0.647).

This parameter suggests that the condition of fixed-term employment need not be a trap for life, even though models of event history analysis would be necessary in order to properly measure the time of outflow from the condition of fixed-term employment.

Being a female increases the risk of being in a temporary job (0.619), while effects referred to region of residence are not statistically significant. Social class of origin does not exert statistically significant effects on the log odds of having a temporary job.[18]

The same results appear confirmed in the GEE model for which we have reported both logit and average marginal effects. Having VET and higher VET decreases the probability of having a fixed-term contract by 3.5 and 2.0 percentage points respectively, while having a Bachelor/Maturity qualification or a university level qualification increases the probability by 3.2 and 2.6 percentage points respectively concerning the reference category, that is 'compulsory school', 'incomplete compulsory school' and 'elementary vocational'. We have to stress that, with the exception of the first parameter referred to VET, the others are not statistically significant.

Moreover, being female increases the probability of having a fixed-term contract by 1.4 percentage points as compared with men, living in Middleland decreases such a probability by -1.5 compared with living in the Lake Geneva area, and living in a couple with children reduces this probability by 1.6 as compared with being single.

Looking at the temporal predictor (wave variable), we can observe that after four years of observation the probability of having a fixed-term contract decreases by about 1.6 percentage points.

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[18] We have found a relatively high value of ρ (intra-unit correlation) (74.2%) expressing the combined effect of path
dependence and of individual heterogeneity factors which were not made explicit in our equation model.

Table 2: Parameters and standard error estimates of the multilevel logistic model regarding the probability of having a fixed-term contract rather than a permanent contract. Balanced sample with 8,828 observations and standard error adjusted for 2,696 subjects. (No weighted results)

Independent variables	Logit Model			GEE Model			GEE Model (average marginal effects)		
	Coef.	Std.Err.	P>z	Coef.	Std.Err.	P>z	Coef.	Std.Err.	P>z
Age at time of first observation (wave 2004)[19]	-0.128	0.048	0.008	-0.071	0.029	0.015	-0.003	0.001	0.015
centred squared age at first observation	0.003	0.001	0.012	0.002	0.001	0.018	0.000	0.000	0.019
Type & Level of Education									
Compulsory, incomplete compulsory, elementary vocational (ref.cat.)									
Domestic science course, 1 year school, general training school,+									
Apprenticeship, full-time vocational school (VET)	-1.304	0.497	0.009	-0.821	0.313	0.009	-0.035	0.009	0.000
Bachelor/maturity	0.824	0.534	0.122	0.566	0.325	0.081	0.032	0.023	0.160
Vocational high school with master certificate, +									
Technical or vocational school, vocational high school (higher VET)	-0.793	0.528	0.134	-0.463	0.331	0.161	-0.020	0.011	0.083
University and academic high school	0.807	0.507	0.112	0.509	0.312	0.103	0.026	0.020	0.182
Gender									
man (ref.cat.)									
woman	0.619	0.235	0.008	0.307	0.142	0.031	0.014	0.008	0.055
Wave Survey									
wave 2004 (ref.cat.)									
wave 2005	-0.365	0.180	0.042	-0.202	0.106	0.056	-0.009	0.004	0.037
wave 2006	-0.321	0.178	0.072	-0.180	0.105	0.086	-0.008	0.004	0.064
wave 2007	-0.647	0.206	0.002	-0.368	0.120	0.002	-0.016	0.004	0.000

To be continued

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[19] The age of subject at first observation (wave 2004) has been centred at 21 years old.

Heterogeneity factors	Logit Model			GEE Model			GEE Model (average marginal effects)		
	Coef.	Std.Err.	P>z	Coef.	Std.Err.	P>z	Coef.	Std.Err.	P>z
Region of Residence									
Lake Geneva (ref.cat.)									
Middleland	-0.575	0.346	0.096	-0.348	0.206	0.091	-0.015	0.008	0.048
North-West Switzerland	-0.503	0.398	0.206	-0.293	0.238	0.219	-0.013	0.009	0.161
Zurich	-0.267	0.353	0.450	-0.217	0.212	0.307	-0.010	0.009	0.262
East Switzerland	-0.271	0.419	0.517	-0.255	0.263	0.333	-0.011	0.010	0.279
Central Switzerland	0.555	0.403	0.168	0.349	0.236	0.138	0.018	0.014	0.196
Ticino	-0.199	0.638	0.755	-0.170	0.389	0.663	-0.007	0.016	0.639
Nationality									
Switzerland nationality (ref. cat.)									
Foreigner nationality	0.455	0.337	0.177	0.264	0.200	0.187	0.014	0.011	0.234
Type of Family									
single (ref. cat.)									
coupe no kids	-0.501	0.303	0.098	-0.271	0.180	0.133	-0.012	0.007	0.090
couple with kids	-0.627	0.285	0.028	-0.328	0.169	0.053	-0.016	0.007	0.025
one parent with kids	-0.120	0.415	0.773	-0.148	0.251	0.556	-0.007	0.011	0.530
other types	-0.286	0.936	0.760	-0.161	0.516	0.754	-0.007	0.021	0.737
Goldthorpes class schema: father main job									
Active occupied but not classified & inapplicable (cat.ref.)									
Higher controllers	0.167	0.414	0.687	0.228	0.253	0.367	0.011	0.014	0.411
Low controllers	0.336	0.434	0.438	0.280	0.266	0.294	0.014	0.015	0.348
Routine non-manual	-0.898	0.638	0.159	-0.363	0.385	0.345	-0.015	0.013	0.266
Self employed with & without employees	-0.387	0.506	0.444	-0.182	0.320	0.570	-0.008	0.013	0.539
Manual supervision	-0.599	0.709	0.398	-0.287	0.440	0.514	-0.012	0.016	0.459
Skilled manual	-0.146	0.469	0.756	-0.116	0.300	0.699	-0.005	0.013	0.684
Semi and unskilled manual & farm labor	-0.212	0.471	0.653	-0.110	0.297	0.712	-0.005	0.013	0.699
Self employed farm	-0.215	0.538	0.689	-0.061	0.336	0.856	-0.003	0.015	0.852
Constant	-3.669	0.752	0.000	-1.790	0.461	0.000	0.045	0.020	0.023
Rho	0.742	0.019							
	Log likelihood -1324.48	Wald chi2(29) 99.02		Corr.: exchange. Sc. par. 1	Wald chi2(29) 133.35				

Source: Our elaboration on Swiss Household Panel data

To summarize, our empirical analysis shows that undergoing a general education and possessing qualifications which do not directly prepare one for a profession increase the risk of having a fixed-term contract. Both of the models used confirm what we have hypothesized, that is, that the chances of having a fixed-term contract appear to be conditioned by the type of education, controlling for important confounders such as class of origin, area of residence, type of family, nationality, cohort, gender and wave. The Swiss educational system, therefore, seems to translate, at least partially, into the necessity of reconciling the need to confront the occupational uncertainties and the educational needs of a competitive economy, in the wake of what has been called the 'Learnfare State'.[20] In order to make the tradition of the Learnfare State more effective, it would be necessary, however, to confront the central knot represented by educational insecurity along the entire life cycle.

8.   Conclusions

Recent research conducted in several European countries brings to light not only the role of institutional factors, i.e. EPL of workers on standard (permanent) contracts, to explain the growing proliferation of fixed-term contracts and their varying incidence across countries in the past two decades (POLAVIEJA, 2005), but also the existence of individual factors strongly associated with the phenomenon in question (SALLADARRE and HLAIMI, 2007).

Given that our analysis was essentially preliminary and exploratory in character, we can agree that the phenomenon of flexibility, measured by taking into account the spread of fixed-term contracts within social groups constructed on the basis of important factors of heterogeneity, is a phenomenon related, to a certain degree, to the position of a subject in the course of life and the type of educational credentials obtained by the subject (vocational versus general education). Furthermore, panel data allow checking for the effects of omitted variables or residual heterogeneity, which can be a source of bias in regression models.

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[20] The term 'Learnfare State' in Denmark indicates an articulated system of the coverage of costs of continuous education, depending on transitions in the labour market and on periods of temporary unemployment. In this sense, the Danish 'Learnfare State' compares with the English 'Workfare State'. See CASTEL (2003) on this point.

Unlike what occurs in other European countries (BARBIERI, 2009; BARBIERI and SCHERER, 2009), flexibility does not seem to significantly affect people who are located at the bottom of the social stratification.

Nevertheless, contractual flexibility can have negative consequences on the course of life of people as far as it involves a delay in the transition to the adult state, an increase in the risk of unemployment, an erosion of employment protection, and a decline in socio-economic wealth conditions and in health and psychological well-being (GOLSCH, 2003, MCGINNITY, GUNDERT and MERTENS, 2005), but at the same time it can be to the benefit of the economic system, making the labour market more flexible and reducing unemployment.

A certain degree of flexibility allows employers to verify the productivity of new employees and allows the screening of their skills and abilities before offering them a standard contract, thereby saving on the cost of dismissal.

Our analysis does not seem to confirm the theory of segmentation in which less educated individuals get fixed-term contracts because they are included in a secondary labour force segment with an increased risk of material deprivation. Conversely, it would seem to better confirm the screening process, on the basis of which workers with high general educational credentials seem more exposed to flexibility as compared to subjects with a VET qualification. It is useful to recall the results of SOUSA-POZA (2004). The author concludes that whether or not the Swiss labour market is perceived as being segmented depends on the choice of method, i.e. on the definition and understanding of segments. In any case, none of the methods used by Sousa-Poza confirm the existence of a large and well-defined secondary segment.

Flexibility in terms of the propagation of fixed-term contracts does not appear to represent a crucial new inequality in Switzerland, such as that which exists in other European labour markets, continental or Mediterranean, characterized by systems of corporate welfare. In other words, the strong flexibility of the Swiss labour market does not seem to determine strong stratification and segmentation.

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