The career paths of agricultural workers: What is the impact of temporary contracts?

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Abstract: Agriculture, more than any other sector, is a provider of temporary jobs. The main aim of the paper is to analyze the impact of the temporary contract in agriculture on the probability of remaining employed in this sector. There is used a discrete-time competing risks duration model with two sub-samples, consisting of seasonal contracts and fixed-term contracts. The results show that while the probability of a worker finding a job increases with the number of temporary jobs already amassed in his or her career, this probability decreases with the number of interruptions in employment. There is also shown the effect of time dependence on the transition probabilities. Whether the temporary contract is seasonal or not, the risks of exiting towards non-employment are greatest for the shortest contracts, but the prospects for finding a job do improve thereafter. In the specific case of the fixed-term contract, the chances of converting this to a permanent contract are greater at the legal limit. Finally, the most highly qualified workers are those who leave the agricultural sector. Nevertheless, the risks of exiting are relatively low: agricultural jobs require a specific capital which is difficult to transfer to other sectors.

Key words: competing risks, duration dependence, multilevel, temporary employment, transition

Agriculture, more than any other sector, is a provider of temporary jobs. Subject to wide fluctuations in activity, agriculture requires a relatively flexible workforce, hence the use of some original forms of employment such as the seasonal contract. In France, such contracts do indeed have a certain number of tax benefits which make them very attractive from the farmers' point of view. These advantages currently consist of an exemption from the employer's contributions and in 2007, 80% of temporary contracts took advantage of this mechanism (CCMSA).

The importance of temporary contracts in the agricultural sector leads us to consider their role in the career path of agricultural workers. The main aim of this paper is to analyse the impact of a temporary agricultural contract on the probability of remaining employed in this sector. Many studies have looked into the effect of temporary contracts on the probability of getting a permanent employment (Van Ours et al. 2004; Gagliarducci 2005; Güell and Petrongelo 2007; etc.). Due to the specificities of the agricultural context, our study differs to these studies in two respects. Firstly, as the agricultural sector offers careers based on a succession of temporary contracts over long periods (Bellit and Détang-Dessendre 2014), we do not consider the stabilization process solely as the transition from a temporary contract to a permanent job; it may also be a succession of temporary jobs with no intervening periods of unemployment. Secondly, we take into account the great variety which typifies temporary employment in agriculture. We do not restrict our analysis to a temporary/permanent dichotomy: we distinguish seasonal contracts from the "traditional" temporary contract, a fixed-term contract.

We used an original database created by the *Mutualité Sociale Agricole* (MSA – Agricultural Social Mutual Fund) which is an inventory of all contracts signed in the agricultural sector between 2002 and 2009. We selected a sample of individuals who signed at least one temporary agricultural contract between 2002 and 2009. We then reconstructed their career path by defining the different states occupied successively during the study period. To find the periods of employment outside the agricultural sector, we complemented the MSA data with the information from the *Echantillon Inter-régimes des Cotisants* (EIC – Inter-regime Sample of Contributors).

To describe the transitions between different employment states, we used a discrete-time competing risks duration model. This empirical specification allows controlling the effect both of the individual characteristics and of the time dependence. We also created indicators such as the number of temporary

contracts or of the employment interruptions already accumulated in order to isolate the effect of past dependences on transitions. Lastly, to avoid parametric assumptions about the unobservable heterogeneity, we adopt the mass points approach introduced by Heckman and Singer (1984).

The main results of a paper can be described as follows: The probability of finding another job increases with the number of temporary jobs already cumulated during the worker's career. Conversely, this probability decreases with the number of interruptions. Thus it appears that the best way of finding a (temporary) job in agriculture is to have a career path made up of recurring jobs of this type. We also study the duration pattern of temporary contracts. Whether the contract is seasonal or not, the likelihood of exiting into the non-employment is greatest for the shortest contracts. In the specific case of the non-seasonal temporary contact (NSTC), the chances of getting a permanent contact (PC) are better with the tenure, with a spike at the legal limit. Finally, it is the most highly qualified workers who leave the agricultural sector. Nevertheless, the probability of leaving is relatively small: agricultural jobs require a specific capital which is difficult to transfer to other sectors (Becker 1976).

TEMPORARY CONTRACTS ACCORDING TO ECONOMIC THEORY

From the supply side point of view, the microeconomic theory is based on the hypothesis of a perfect substitutability of economic agents and hence a homogeneous labour factor. The human capital theory introduced by Becker (1964) removes this forceful hypothesis, and attempts to explain the productivity and wage differentials in terms of differentials in the levels of knowledge that individuals can accumulate. Thus, education is not considered as a consumer good but as an investment which, eventually, increases the wage level. This notion of human capital is therefore based on the idea of a process of accumulating knowledge and skills over time. Becker (1964, 1976) makes a distinction between the general training often obtained at school and specific training acquired through experience in a company. The former is a set of generic knowledge that can be applied across the entire labour market. The latter is associated with a specific know-how which is not easily transferable: "Human capital is specific if it increases a worker's productivity only at the firm" (Becker 1964). Agricultural workers often have few qualifications and they are therefore all the more concerned by this type of specific capitalization acquired through experience. In situations where the information is imperfect, experience may be an appropriate indicator of the worker's productivity level. In an extension to the human capital theory, the signalling theory developed by Spence (1973) presents the accumulated capital as a means of the worker selection: those with more work experience would have more chance of being recruited. In this situation, a temporary contract should give the worker the opportunity to acquire specific skills enabling him/her ultimately to build up his/her professional career path. Many studies investigated the impact of the temporary contract per se (state dependent) and the time spent in this type of contract (duration dependent) on getting a permanent job. The empirical tests are inconclusive. Van Den Berg et al. (2011) show that while temporary jobs increase the probability of an unemployed finding a permanent job, this "steppingstone" effect is not significant in the long term. Nevertheless, they conclude that temporary jobs significantly shorten the unemployment duration. Güell and Petrongelo (2007) studied the effect of the legal duration constraints of temporary contracts on their conversion into the permanent ones in Spain. They show that the probability of conversion increases with the length of time spent in the temporary employment with a pronounced spike at the legal limit duration for a temporary contact. Adopting a descriptive approach, Cancé and Fréchou (2003) present the temporary contract in France both as a tool against unemployment and also a steppingstone for the permanent employment. They do distinguish between the "traditional" temporary and the interim contract[1], which is often of a short duration and which results in stability much less often.

While these studies provide evidence in favour of the positive impact of the temporary contract on the probability of getting a permanent job, other studies present the temporary contract as a "trap" of an endless precariousness. Some professional trajectories are indeed built on recurring short contracts, with the temporary jobs leading on to other temporary

[1]An "interim" contract is signed to meet temporary requirements. It cannot be used for the normal activity carried out in a company.

jobs (Joutard and Werquin 1992). A form of employment continuity emerges linked with a succession of temporary contracts without ever becoming unemployed (Eckert and Mora 2008). It is not so much the nature of the contract that poses a problem, but rather the discontinuity that it implies. A succession of temporary jobs reduces the probability of an individual finding a stable employment and this becomes even more unlikely when there are gaps between jobs (Gagliarducci 2005). For Farber (1999), professional trajectories are marked by a strong inertia. Using a theoretical model, he stresses the positive link between the probability of the individual turnover and the number of jobs already held during the career. Thus the stable and mobile courses clearly emerge, with the latter distinguished by a succession of temporary jobs. Using French data, Givord and Blasco (2010) estimate empirically the strength of transitions between the different states in the labour market. They observe a high level of persistence of professional situations over time and thus put the "steppingstone" effect of temporary contracts into perspective.

From the demand side point of view, temporary contracts may be used as a screening device when the productivity of a worker is not directly observable upon hiring. The wage is therefore reassessed for each period and then adjusted until the worker's "true" productivity is revealed. According to Jovanovic (1984), only the best matches endure (" (...) survival of the fittest match"). Using the German data, Boockman and Hagen (2008) highlight the use of the temporary contract as a means of testing the worker, but at a reduced cost. Indeed, since the worker's productivity cannot be known beforehand, temporary contracts offer the employers the possibility of ridding themselves of any bad matches without firing cost. . Conversely, the good matches are retained. To validate this hypothesis, they show that after a certain lapse of time (two years in average), jobs that began with a temporary contact come to an end less frequently than those that started out with a permanent one. Thus the authors validate the hypothesis that a temporary contract is a good instrument for experiencing the quality of a match. Temporary contracts can also meet the need for flexibility when there are fluctuations in the company activities. Ultimately, there is no advantage for companies in renewing or stabilizing this temporary labour force.

The existing theory fails to provide an unequivocal answer, given the role of a temporary contract in individual career path. Thus, they lead to highly varied situations or trajectories in the labour market.

THE SPECIFIC CASE OF THE FRENCH AGRICULTURAL SECTOR

Types of temporary employment in agriculture[2]

Because it is so dependent on climatic conditions, the agricultural sector more than any other undergoes marked fluctuations in activity. Seasonal temporary contract (STC) and non-seasonal temporary contact (NSTC) can be used by farmers for covering casual jobs. However, the STC has to be justified by the cyclical nature of the increase in activity. In addition, the legal framework surrounding the STC differs in several respects from the NSTC. In the former case, no end-of-contract compensation is payable by the employer; no latency period is required between two successive contracts, there is no obligation to convert to an permanent job if the seasonal contract is renewed several times; Lastly, the STC contains no precise terms.

Another advantage of the STC over the last twenty or so years has been the reduction in the employers contribution. These reductions were originally aimed at promoting the employment of unemployed people or casual workers. The latter had to be affiliated to a statutory social security scheme and were recruited to cope with a peak in activity for a maximum of 100 days.[3] Gradually, the exemption measures were applied to a much greater number of workers and farmers. When the obligation to be affiliated to a social security scheme was abolished, foreigners were also able to take advantage of the reduction in charges under the terms of the OMI (Offices of International Migrations) contract.[4] In addition, similar measures were extended to a much wider range of agricultural activities. Finally, the maximum duration for the application of these re-

[2]The different forms of temporary employment in the agricultural sector are not described here exhaustively. Temporary contracts signed through a group of employers are another original form of employment used in this sector. However, the database used here is not able to dissociate these from other types of contract.

[3]Decree No.95-703 of 9 May 1995

[4]Fixed-term contract aimed at foreigners. Their right of residence is linked with the duration of their work contract.

duced rates was increased from 100 days to 119 days per employee and per calendar year. In agriculture today, this exemption policy is applied in the form of the TO-DE[5] (*Travailleurs Occasionnels-Demandeurs d'Emploi* Occasional workers-Job seeker) mechanism. With so many specific benefits inherent to seasonal contracts, there may be an incentive for farmers to use them improperly: for instance, seasonal workers may be given tasks that are not associated with the rhythm of the seasons but which could be more appropriately described as an increase in activity. The seasonal contract is now used not only as a means of coping with fluctuations in the activities linked with agricultural production: it is also used as a means to reduce labour costs. Moreover, in a context of a global decline in agricultural work, the STC increase. Between 2000 and 2009, permanent contracts decrease of 12%, the NSTC stay at the same level and the STC increase of 9% (Villaume, 2011). The TO-DE contracts account for 71% of the temporary contracts drawn up for agricultural production in 2011.[6]

Highly varied employment paths

In a sector where temporary contracts represent almost one half of all active contracts (Villaume 2011), it would appear to be difficult to integrate workers into permanent employment. Only 3% of workers who started with a STC in 2007 signed a permanent contract in 2008 or 2009. This is the case of 10% of those who signed a NSTC in 2007 (Villaume 2011). If we consider the stabilization process to consist of getting a permanent job, this is a phenomenon that is clearly not observed very much in the agricultural sector. In their typology, Bellit and Détang-Dessendre (2014) clearly show the strong variation in the career paths of agricultural workers. Career paths in agriculture are distinctive both for their level of stability and for the degree to which they are firmly rooted in the sector. On the one hand, there are stable trajectories (very few contracts, rooted in agriculture), which account for over a third of the sample, and on the other hand, there are trajectories consisting of a series of temporary contracts. By differentiating the STC to NSTC, the study demonstrates the existence of careers built on a sequence of the STC over long periods. A multinomial logistic regression model reveals the accumulation of the specific capital, i.e. the professional experience in agriculture as a factor favouring stability in the sector. Education does not guarantee a professional stability. In fact, the non-qualified workers are more likely to have a stable career path in agriculture than in other sectors. There are also local characteristics which seem to be an important factor in constructing the career paths of agricultural workers. When the local level of industrial employment is high, farmers seem to have more incentive to stabilize their workers to avoid the hold-up risks. Furthermore, employment in the agricultural sector may correspond to a temporary period in a professional career. 50% of workers with temporary contracts in 2007 were no longer in the agricultural sector in 2009 (Villaume 2011). Bojnec and Dries (2005) looked into the causes of the flow of workers from the agriculture sector. The general human capital, i.e. the level of education, seems to be a major factor for the movement between sectors. The most highly educated individuals are more likely to move into other sectors. By contrast, those who are least educated, have less chance of finding work outside agriculture and are thus more likely to stay there. Looking at the Swedish data, Gullstrand and Tezic (2008) gave the reasons for people exiting the agricultural sector as (i) the labour income reflecting the quality of the firm-worker match, (ii) the costs of changing jobs, and (iii) the costs of changing the sector. Thus the more specific know-how linked with the job and/or the sector, the higher the cost of changing jobs and the sector. In other words, agricultural workers with a high level of the sector-specific capital are less likely to leave agriculture.

Temporary contracts have not often been studied in the context of labour economics applied to the agriculture sector. Recent studies have considered the links between the family structure of farms and their demand for paid workers (Benjamin 1996; Benjamin and Kimhi 2006; Blanc et al. 2008; Bjornsen and Biorn 2010), but none has looked at the wide variations that typify the agricultural workforce. More generally, the literature has considered paid employment in terms of a permanent – temporary dichotomy (Givord et al. 2009; Van Den Berg et al. 2011). To understand how the paid employment market in agriculture operates, and more particularly the forms of stabilization that can be expected in this sector, it seemed sensible to make a distinction between the different temporary

[5]Law no. 2010-237 of 9 March 2010.
[6]Source: CCMSA

contracts: thus, the seasonal contracts,[7] lasting less than six months, are dissociated from the "traditional" fixed-term contracts (CDD).[8]

To our knowledge, all economic studies on the subject have considered the process of stabilization as the passage from a temporary contract to a permanent contract. By taking into account the agricultural sector's need for flexibility and the many specific advantages of seasonal contracts, we suggest that there are other forms of stabilization. These could be a long-term relationship between a worker and one or several farms, which would consist of a worker call-back phenomenon via the successive temporary contracts. Two factors would be important in this case: the legal framework of the temporary contracts and the specific capital that the worker has accumulated.

(i) The employee call-back phenomenon via temporary contracts would be all the more relevant since the legal framework in which the temporary contracts operate is a flexible one. And in turn, a more flexible legislation should reduce the risk of the breaks in employment between contracts, with the firms not required to observe a grace period between two contracts.

(ii) The accumulation of the specific capital, here measured by the time spent in agriculture, should favour the access to a permanent job or to another temporary job and conversely it should reduce the risk of moving into unemployment. If we adopt the hypothesis that the seasonal work essentially involves packing and picking jobs, requiring very little in the way of qualifications, then they should not be affected by this form of a specific capitalization.

(iii) The time spent out of work would favour the transitions towards non-employment.

DATA

We used information from various sources, with the main database being supplied by the MSA (Agricultural Social Mutual Fund). This is a social protection scheme providing cover for the entire population of salaried and non-salaried agricultural workers in France. Work contracts are counted by the means of the employer declaration forms. When someone is hired, the farm managers make a declaration to the MSA giving the type of the work contract signed, the wage and the number of hours worked for each employee. Unlike the retrospective surveys, which can suffer from the effects of the memory recall error, the database we used provides an exhaustive coverage of the scope of application. It groups together all employment contracts between 2002 and 2010 for workers contributing to the agricultural social security scheme. As each individual is identified by a personal number that is unique in time, it was easy to create a longitudinal data file. The database also provided a fairly wide range of information on the job held when the person first became a member of the agricultural scheme (sector of activity, wage, start and end dates of activity, type of contract, etc.). To complete the workers' trajectories by including the periods of work outside agriculture, which were thus not covered by the MSA, we used the EIC (Inter-regime Sample of Contributors). This follows a sample of contributors to different French pension schemes throughout their career. We used the last available sample, from 2009, which includes almost 240 000 individuals.[9] The EIC is updated every 4 years and at each deadline, in this case 31st December 2009; it collates all contributors aged from 23 to 75. Using the information available in the different files, the initial database covers the career paths of 18 630 individuals between January 2002 and December 2009, i.e. for seven years.

Since our primary interest is temporary contracts, we selected people who had had at least one temporary contract in agricultural production between 1st January 2002 and 31st December 2009. We do not consider agricultural workers whose activity is limited exclusively to the grape harvests, and we also eliminate very short contracts which are mainly held by students. In our analysis, an individual's initial condition is considered to be his/her first temporary contract between 1st January 2002 and 31st December 2009. In order to avoid difficulties associated with the left-truncated data, we eliminated all contracts that

[7]In the present study, seasonal contracts are those that benefit from an exemption or a reduction in employer's contributions applied specifically to casual workers.

[8]In 2009, half of seasonal contracts, excluding grape harvest contracts, lasted less than 29 days, whereas half of non-seasonal CDDs lasted more than 100 days (Villaume 2011).

[9]This is a rolling sample survey: each new sample is composed of the individuals in the previous EIC samples (aged 75 or under on 31st December 2009) and the additional contributors aged 23 when the survey was carried out. The sampling rate is one generation out of four between 1934 and 1986 and 2.68% per generation.

Table 1. Distribution of episodes by the transition type

Destination	STC		NSTC		PC		OAC		NE		Total	
Origin	nb	%	nb	%	nb	%	nb	%	nb	%	nb	
NSTC	373	7.6	838	17.2	304	6.2	376	7.7	2 996	61.3	4 887	100
STC	3 096	19.9	422	2.7	239	1.5	577	3.7	11 250	72.1	15 583	100

237 seasonal contracts and 220 NSTC are right-censored

started before 1st January 2002. In this way, we also avoided any overestimation of the duration of first contracts since a contract begun before 2002 is by definition still active after 2002. However, contracts with an end date later than 31st December 2009 were right-censored. Finally, we are working on a total sample of 5151 individuals and 20 927 episodes of temporary contracts in agriculture.

We studied the different possible transitions from a temporary job.[10] We distinguished the STC to NSTC to demonstrate any difference in the effect, if any. Both temporary contract types can lead to an exit to another temporary contract in agriculture (TC), a permanent contract in agriculture (PC), a job outside the agriculture sector (OAC) or an episode of non-employment (NE). We do not distinguish the STC and NSTC in exit states because the transitions frequencies between the NSTC and STC are very low (Table 1). The episodes of non-employment correspond to the periods without an employment contract and hence include the periods of inactivity. The "OAC" state is made up of episodes of employment outside the agriculture sector, but with no distinction between permanent and temporary contracts.[11] Finally, we considered "retirement" as an absorption state, and thus eliminated any subsequent episodes. Looking at studies by Villaume (2011) on all employment contracts in agriculture, our sample is representative in terms of transitions observed between such contracts and we also obtained similar transition frequencies between the temporary contracts and stable contracts in agriculture.

Table 1 shows the distribution of episodes of employment with a NSTC or STC, according to the type of transition. We note that the majority of the NSTC or STC episodes are followed by a period of unemployment (61.3% and 72.2% respectively). This suggests that there is a degree of discontinuity in the career paths that include a temporary employment in agriculture. A smaller though not insignificant proportion of the NSTC or STC were followed by another contract of the same type (almost 20%). These figures confirm the idea of a recurrence of insecure contracts among agricultural workers. On the other hand, there are few transitions to a PC, which concern only 6.2% and 1.5% of the NSTC and STC, respectively. Nevertheless, it can be seen that this frequency of stabilization was about four times higher for the episodes of work with a NSTC. Finally, 7.7% of the NSTC and 3.7% of the STC were followed by an exit from the agricultural sector. Thus, the workers with a NSTC leave agriculture more often than seasonal workers.

Table 2 shows that for the two types of a temporary contract of very short duration[12] , it is more common to see the transitions to another temporary contract or an episode of unemployment. They are longer in average when they are followed by a PC. This suggests the use of temporary contract as a test of the quality of the worker-job match before hiring. Seasonal workers leave the agricultural sector more frequently after a relatively long temporary contract. Conversely, there are proportionately fewer exits from agriculture for those with a NSTC of over a year.

Table 3 shows the descriptive statistics for the total sample of 20 927 episodes of temporary contracts, and the two sub-samples with 15 820 episodes of seasonal contracts and 5107 episodes of NSTC. We have different categories of variables to describe each sample. The first consists of individual characteristics that may influence the transitions from temporary contracts such as gender, age and nationality. We considered the age reached at the beginning of each episode. As we had no information on the education levels, we considered the highest level of the PSC (Professions and Socio-professional Categories) reached as an indicator of the level of qualifications. In our sample, overall we found the characteristic features of hired

[10]Episodes of non-employment are considered if the time without employment between two contracts exceeds one month.
[11]The EIC does not provide information on the type of contract signed outside the agriculture sector.
[12]As seasonal contracts are of very short duration, we set shorter time intervals than for the CDDs.

farm labour: the majority of men (60%), younger than the average age for the active population (32 years old). However, we did observe a slightly higher proportion of women when the temporary contract was seasonal. Conversely, this proportion was in average lower when the contract was a NSTC. As this study excludes the grape harvesters and other very short-term contracts, the seasonal effect and the associated insecurity are reduced (Villaume 2011). Using the EIC for the selection purposes gives an over-representation of French people, who account for more than 90% of the individuals in the different samples. Finally, the majority of the sample is in intermediate professions or in jobs as skilled workers. Note that in no instance does the PSC level reflect the qualification required for the job in question. It is rather an indicator of the level of competence reached by the individual in the course of his career path.

Another series of variables includes features of the past career. We created various indicators to measure the number of breaks in employment or in the temporary contracts (differentiating the STC and NSTC) that had already been accumulated. When the contract is a NSTC, the number of breaks in employment already experienced is in average higher. We also note that the holders of seasonal contracts have already had more than 4 other seasonal contracts in average and no NSTC. This reinforces the idea of a career path marked by a recurrence of seasonal contracts over a long period (Bellit and Détang-Dessendre 2014). This is less true when the short contract is a NSTC. We also created a variable measuring the amount of time already spent on a farm to demonstrate the idea of a worker rotating in the same business. In addition, we have variables giving the work experience or more specifically the work in agriculture before 2002, i.e. before they became part of the sample. These variables enable us to take the initial conditions into account. The situation observed in January 2002 is necessarily correlated with a past career that is unobservable. In general, people with a NSTC have more experience in farming or in the agricultural sector as a whole in average than those with seasonal contracts. This confirms the hypothesis that the NSTCs require a higher level of the specialist capital than the seasonal contracts.

We also included variables to describe the characteristics of the local labour market. We considered the category of the area in which the individual was located in terms of urban/rural and the distance to the nearest urban centre of more than 50 000 inhabitants. The aim here was to define the accessibility to jobs. Similarly, the unemployment rate in the living zone is an indicator of the economic context in which the worker is living. Lastly, we introduced variables to measure the employment rate by sector in 1999 in the living zone in order to determine its economic structure. In average, when the temporary contract is seasonal rather than a NSTC, the worker is more likely to live in a rural area.

Table 2. Episode duration and transition type

Transition	NSTC-TC		NSTC-PC		NSTC-OAC		NSTC-NE	
Month	nb	%	nb	%	nb	%	nb	%
[0;3[	542	44.8	65	21.4	139	37	1 655	55.2
[3;6[	376	31	80	26.3	72	19.1	597	19.9
[6;12[	160	13.2	63	20.7	91	24.2	475	15.9
>12	133	11	96	31.6	74	19.7	269	9
Total	1 211	100	304	100	376	100	2 996	100
Censored				220				
Transition	STC-TC		STC-PC		STC-OAC		STC-NE	
Month	nb	%	nb	%	nb	%	nb	%
[0;1[	1 297	36.9	38	15.9	199	34.5	4 720	42
[1;2[	730	20.7	48	20.1	123	21.3	3 221	28.6
[2;3[	444	12.6	27	11.3	63	10.9	1 195	10.6
> 3	1 048	29.8	126	52.7	192	33.3	2 114	18.8
Total	3 519	100	239	100	577	100	11 250	100
Censored				237				

Table 3. Descriptive statistics

	Total sample	STC	NSTC
		mean or share	
Age	32	32	31
Gender			
Male	0.56	0.53	0.6
Female	0.44	0.47	0.4
Nationality			
French	0.94	0.94	0.93
Other	0.01	0.01	0.01
Unknown	0.05	0.05	0.06
PCS			
Manager/Intermediate profession	0.49	0.48	0.53
Skilled worker	0.26	0.25	0.27
White-collar worker	0.16	0.18	0.12
Unskilled worker	0.09	0.09	0.08
No. of employment breaks	2.6	2.8	1.9
No. of CS	3.5	4.3	2.2
No. of CDD	0.9	0.4	1.3
Experience on farm (in months)	1.6	0.9	3.9
Experience working before 2002 (in quarters)	31.4	32.4	28.3
Experience in agriculture before 2002 (in quarters)	7.1	6.8	7.9
Category of area			
Urban	0.51	0.49	0.57
Rural	0.49	0.51	0.43
Distance to urban centre	37	37.5	0.36
Agriculture and agrifood employment rate	0.18	0.19	0.16
Industrial employment rate	0.13	0.13	0.14
Services employment rate	0.58	0.58	0.6
Unemployment rate in living zone	0.08	0.08	0.08
Nb. of episodes	20 927	15 820	5 107

ECONOMETRIC MODEL

Model specifications

To study the determinants affecting the probability of exiting a temporary contract to move into another state, we observed the states occupied successively in the labour market by the 5301 individuals in our sample over a seven-year period. Because of the specific features of the seasonal contract both legally and in the terms of cost, we decided to operate two different models depending on whether the individual had a seasonal contract or a CDD. By distinguishing among the types of temporary contracts, we obtained two sub-samples with 15 820 episodes with a seasonal contract and 5107 episodes with a NSTC. In addition to observing the factors that influence the exit from the temporary contract, we hoped to reveal some duration-dependent phenomena. Thus we were interested in whether the duration of the temporary contract affected the probability of the individual's leaving it[13]. In order to take into account the numerous possible outcomes and time effects, we considered the work of Steele et al. (1996), Steiner

(2001) and Steele and Goldstein (2004), who propose a multinomial model. In contrast to the traditional approach to the analysis of competing risks which consists of estimating each event separately and censoring all the other events, in this case, we define a multinomial logistic model, which has the advantage of being able to estimate all risks simultaneously by considering the censored cases as the reference category. We therefore have a mixed multinomial logistic model (Train 2003) where the modalities correspond to an exit into unemployment, an exit to another temporary contract in agriculture, an exit to a contract outside the agricultural sector or an exit to a permanent job in the case of a NSTC. This last modality corresponds to a continuation of the current temporary job.

When working with longitudinal data, the event being studied may occur several times for the same individual. In our case, this indicated that the same person could experience several episodes of working on a temporary contract between 2002 and 2009. The duration of the episodes can then be correlated with the existence of unobserved factors at the individual level which are thus common to all episodes. Considering each event separately is statistically inefficient since the process varies very little between different episodes for the same person. Moreover, not taking into account the unobserved heterogeneity between the individuals produces a negative time-dependence bias of the risk function. A selection comes into operation over time so that the sub-population with the highest chances of exiting are excluded from the population at risk. Thus the risk for the population observed tends towards the lowest risk. One alternative is to form "clusters" of individuals and to define their past using variables. We opt for a second alternative, which is to envisage a multilevel model: "Multilevel event history models have been developed for the analysis of hierarchical duration data, where the hierarchical structure results from repeated events within individuals or clustering of individuals within some higher-level grouping such as geographical area" (Steele and Goldstein 2004). Thus by taking the hierarchical structure of the data into account, we can put aside the hypothesis of independence between the periods by including a random effect which has the dual advantage of controlling both the unobserved heterogeneity affecting each individual and the correlations between different episodes for the same individual. In the case of repeated events, the different episodes are considered as level 1 in the hierarchy and the individual as level 2.

The multilevel approach requires a certain organization of the data. Thus we duplicate the data in each sub-section in order to obtain as many lines as the time intervals of 15[14] days preceding a transition or censoring, if applicable. This means dividing the duration t_i^s of the episode s the individual i into t intervals of 15 days where $t \in \{1, ..., T\}$[15] For each discrete time interval t of the episode s of the individual i, we observe a multinomial variable y_{tsi} which shows whether an event has taken place or not. We assume that there are K possible events. Variable $y_{tsi} = k$ if type $k \in \{1, ..., K\}$ event occurs during interval t, and $y_{tsi} = 0$ if there is no event. Identifying a competing risk model implies imposing a structure on the intensity of transitions between states, i.e. on the hazard ratios. Traditionally, we assume a mixed proportional hazard (MPH) model: the observable and unobservable characteristics produce values that are strictly proportional to the risk functions. The risk of an event k occurring in the interval t for the individual i written $h_{tik}^s(t)$, is the probability that an event of type k will occur in the interval t knowing that the individual i has continued in the same state until the beginning of interval t.

$$h_{tik}^s(t) = \frac{exp[h_{tik}^0(t) + \beta'_k X_{ik} + v_{ik}]}{1 + \sum_m^K exp[h_{tim}^0(t) + \beta'_m X_{im} + v_{im}]}$$

$h_{tik}^0(t)$ corresponds to the baseline hazard: it measures the effect of time spent in one state on the probability of exiting this state, in other words time-dependence. X_{ik} is the vector of the individual's observable characteristics at the beginning of each episode s. It shows the effect of the individual characteristics, the previous career paths such as the time already spent in a state or the number of the temporary contracts already accumulated, and finally the local labour markets. v_{ik} shows the individual

[13]Because the proportion of transitions between seasonal contracts and permanent jobs in agriculture is very small, we do not consider this type of movement in the regression model.

[14]We set a very short time interval in order not to overlook a large proportion of seasonal contracts with durations that can often vary between 15 days and 6 months.

[15]Each sample groups together the contracts of a minimum duration of 15 days. The variable t is therefore always greater than 0.

unobserved heterogeneity. In addition, in the frame of a competing risk model, the unobserved factors that are specific to the individuals may also vary depending on the alternative to which the temporary contract leads. In this case, this means specifying K random effects assumed to follow a normal distribution with mean 0 and finite variance σ_r^2 with a non-null covariance matrix. With a non-null correlation between the random effects, we first relax the Independence of Irrelevant Alternatives (IIA) hypothesis and also take into account the fact that the common unobserved factors may affect several types of transitions (Train 2003). For example, we can assume that the unobserved factors such as the worker's motivation or the preference for the labour market have a (positive) effect on the risk of exiting for another temporary contract in agriculture and of exiting for a job outside agriculture.

In instances where the episode of temporary employment is not followed by a transition to another state at the end of the observation period, the episode is said to be censored. In such cases, the probability that for the individual i there is no transition to k until the end of interval t is written:

$$S_{ti}^{s}(t|X_{ik}, v_{ik}) = 1 - h_{tik}^{s}(t|X_{ik}, v_{ik})$$

Thus the contribution of the individual i to the likelihood of a complete episode, i.e. an uncensored episode, marking a transition to k is:

$$P_{ik}(t/X_{ik}, v_{ik}) = h_{tik}^{s}(t/X_{ik}, v_{ik}\ ) S_{ti}^{s}(t/X_{ik}, v_{ik})$$

Baseline hazard specification

Specifying a parametric form of the baseline hazard may produce skewed results. Imposing a structure on the baseline hazard assumes hypotheses that are difficult to justify in the economic terms. We therefore opted for a more flexible approach by specifying a piecewise constant baseline hazard. Thus the risk follows an exponential distribution across each time interval. We determined different time intervals depending on the original envisaged state, i.e. STC or NSTC. The baseline hazard is written:

$$h_{tik}^{0}(t_i^s) = exp\left[\sum_{n=1}^{N} \lambda_{jk}^{n} d_n(t_i^s)\right]$$

$d_n(t_i^s) = 1$ if duration t_i^s is within time interval $[n-1;\ n[$ and 0 otherwise. λ_{jk}^{n} corresponds to the constant specific to the transition to k for interval $[n-1;\ n[$.

Unobserved heterogeneity specification

We opted for a flexible approach by assuming that v_{ik} follows a discrete distribution for the unobserved heterogeneity (Heckman and Singer 1984). Thus, v_{ik} takes a finite number of values (b_1, ..., b_m) with the probability p_m that $v_{ik} = b_m$ and therefore this method consists of the modelling heterogeneity with M mass points:

$$\sum_{i=1}^{m} p_i = 1$$

Finally, the likelihood function is written:

$$L = \sum_{l=1}^{L} P(v_{ik}) \left\{ \left(\prod_{t=1}^{T} \prod_{i=1}^{N} \prod_{s=1}^{S} \prod_{k}^{K} h_{tik}^{s}(t|X_{ik}, v_{ik})^{\gamma_k^t} \right) \left((1 - h_{tik}^{s}(t|X_{ik}, v_{ik}))^{1-\gamma_k^t} \right) \right.$$

Where $\gamma_k^t = 1$ if there is a transition to state k at the end of the interval t and 0 otherwise.

RESULTS

Non-parametric analysis

By adopting a non-parametric approach using the Kaplan-Meier plot, we use the empirical form of the risk function without imposing any law specifications. Figure 1 shows the instantaneous exit rate to non-employment according to the type of the temporary contract held by the worker. For seasonal workers, the risk of this being followed by a period of inactivity reaches a peak at 3 months and 10 months approximately, the dates that correspond to the term for short contracts in agriculture and the maximum legal duration of seasonal contracts, respectively. For the NSTCs, which are often of a longer duration, the exit rate to non-employment is very low for the first 15 months, then it increases exponentially. This increase in the exit rate for contracts of more than 15 months seems to match the maximum legal duration for the NSTCs, which in the majority of cases is 18 months. Note that when the legal limit has been reached, the NSTCs have higher exit rates to non-employment than the seasonal contracts. Figure 2 shows the risk

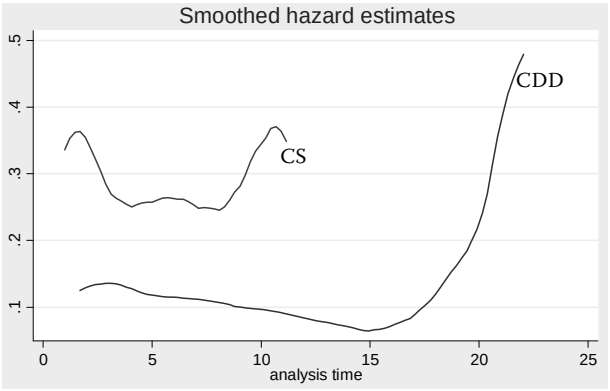

Figure 1. Hazard ratio for non-employment

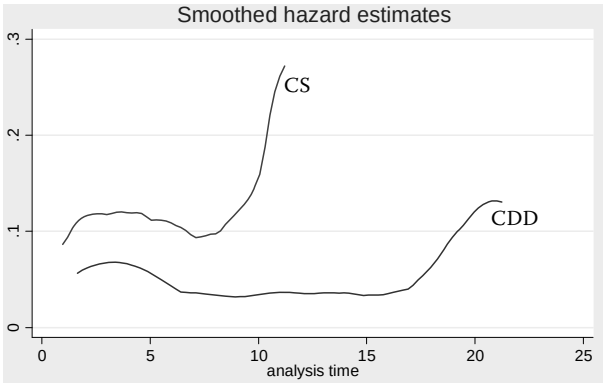

Figure 2. Hazard ratio for another temporary contract

of exiting to another temporary contract. The two curves are similar in appearance. The exit rate for a NSTC to another temporary contract is low to start with, and then increases as it approaches the maximum legal duration. The exit rates for a NSTC or a seasonal contract reach a "slight" peak in the third month, which could represent a trial period for the worker before a contract is renewed. After a certain time spent on a seasonal contract or a NSTC (6 months and 18 months respectively), the chances of finding a job of the same type increase greatly. Note that exit rates to another temporary contract also increase at the point when the NSTCs or STC reach their respective maximum legal durations. We also note that across the entire observation period, the rates of transition to another temporary employment are markedly higher for the seasonal contracts than for the NSTCs. Lastly, figure 3 shows exit rates for the agricultural sector. Whether the contract is seasonal or not, exit rates from the agricultural sector are low for the short temporary contract durations. After a certain time spent on a seasonal contract or a NSTC in the agricultural sector, which are here put at about 8 months and 18 months respectively, the hazard rates increase. Nevertheless, although the exit rates from agriculture can reach 20% for the NSTCs, they remain below 10% for seasonal contracts. Finally, in the case of the formers, we look at the probability of exiting to a permanent job. Figure 4 shows an upward curve: the exit rate to a permanent job increases continuously, and accelerates as it approaches the maximum legal duration. The NSTC would appear to be a test before a worker is hired in instances where the information may be imperfect (Jovanovic, 1984).

Parametric analysis

In this section, we present results of the estimates from the econometric model applied to the two subsamples, the seasonal contracts and the NSTCs. As described above, the models estimate the probability of a worker's exiting a seasonal contract or a NSTC to move on to (1) non-employment, (2) another temporary contract, (3) a job outside agriculture, or (4) a permanent contract, only in the case of a NSTC. In each estimate, we take into account the unobserved

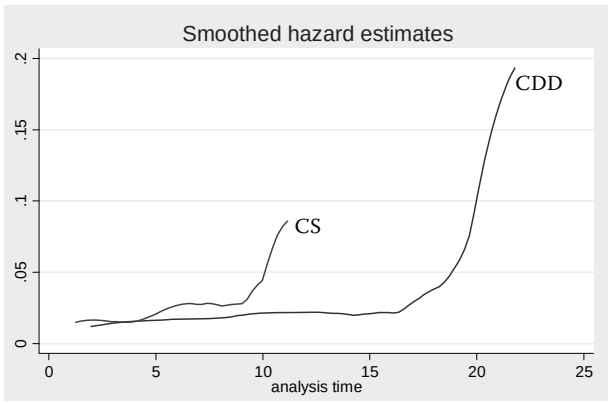

Figure 3. Hazard ratio for another sector

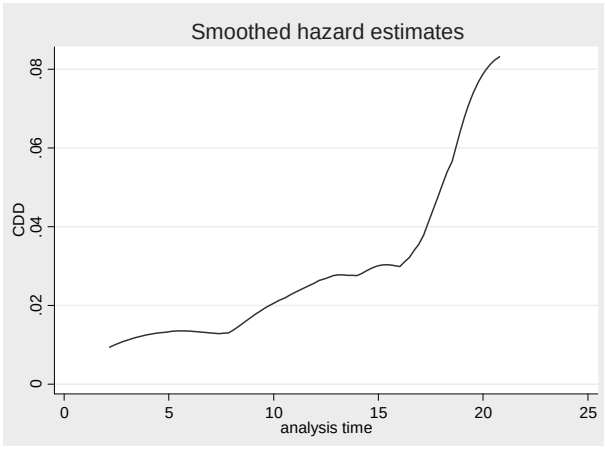

Figure 4. Hazard ratio for the NSTC into permanent job

heterogeneity by introducing two mass points. Thus we assume that there are two categories of individuals in the light of the unobservable characteristics.

Table 4 presents the results from the estimate of the mixed multinomial logistic model for the sub-sample of seasonal contract episodes. As expected, workers aged under 30 have a higher probability of finding themselves in a situation of non-employment. They also have more chance of finding the same type of job after having a seasonal contract. Conversely, workers aged over 50 are less likely to find a temporary job. In the case of seasonal contracts, the youngest workers seem to be more likely to hold a succession of temporary contracts in agriculture than their older

Table 4. Estimate of hazard rates: Seasonal contracts

	STC-NE		STC-TC		STC-OAC	
	coeff.	std. err.	coeff.	std. err.	coeff.	std. err.
Age range (ref: 31–40)						
Under 21	0.950***	0.045	0.216**	0.073	–0.399**	0.172
21 to 30	0.362***	0.038	0.153**	0.057	0.179	0.102
41 to 50	0.003	0.045	–0.015	0.062	–0182	0.123
Over 50	–0.139	0.050	–0.413***	0.073	–0.365*	0.143
Male	0.134***	0.028	0.227***	0.043	0.036	0.082
Type of post (ref: Unskilled worker):						
Skilled worker	0.173***	0.501	0.031	0.070	1.376***	0.241
White-collar employee	0.088	0.054	–0.063	0.077	1.06***	0.252
Supervisory post	0.28***	0.047	0.078	0.066	1.703***	0.234
Nature of farm activity: (ref: Viticulture)						
Cultivation/Livestock	–0.446***	0.501	–0.28***	0.078	–0.204	0.151
Cereals	–0.334***	0.035	–0.187**	0.057	–0.456***	0.116
Fruit/Vegetables	–0.493***	0.035	–0.384***	0.057	–0.551***	0.113
Other	–0.672***	0.028	–0.462***	0.062	–0.202	0.114
Agriculture employment rate	0.262	0.150	0.465**	0.230	–1.427**	0.478
Industrial employment rate	–0.187	0.184	–0.584*	0.280	–0.436	0.526
Agrifood employment rate	–0.261	0.345	0.212	0.493	0.115	0.981
Distance to nearest urban centre	–0.001**	0.001	–0.003	0.001	–0.01**	0.003
Unemployment rate in employment zone	–0.04***	0.007	–0.064***	0.011	–0.026	0.020
No. of temporary jobs cumulated	–0.091***	0.005	0.057***	0.006	–0.149***	0.017
No. of employment breaks cumulated	0.138***	0.008	0.025*	0.010	0.219***	0.022
Duration dependence						
ln (time)	0.401***	0.043	0.412***	0.063	0.472***	0.087
< 3 months	–1.674***	0.112	–2.838***	0.172	–4.547***	0.374
3–6 months	–1.951***	0.122	–2.377***	0.186	–4.716***	0.407
> 6 months	–1.791***	0.146	–2.275***	0.210	–3.888***	0.438
Unobserved heterogeneity						
Type 1 constant	–0.855		–0.837		0.525	
Type 2 constant	0.777		0.844		–0.495	
Type 1 probability	0.34					
Type 2 probability	0.66					

Significance level: ***1%, **5%, *10%

counterparts. Finally, note that the youngest and the oldest generations have less chance of finding a job outside the agricultural sector.

The skill level, which here we approximate to the highest socio-professional category reached in the course of the individual's career path, does not seem to provide any protection against unemployment. On the contrary, employees who have already had a job as skilled workers or supervisors are more likely to experience a transition into non-employment after a period on a seasonal contract. This result does highlight a feature specific to the agricultural sector and to seasonal jobs in particular in that they are often packing jobs requiring little or no qualifications. On the other hand, the level of qualification seems to offer the workers the possibility of exiting the agricultural sector. Employees who have already held a post as a supervisor, a white-collar employee or a skilled worker are more likely to find a job outside agriculture than the non-qualified workers. These findings are in agreement with those of Bonjec and Dries (2005), who stressed the positive link between human capital and job opportunities.

We also introduce variables to monitor the nature of the activity on the farms where the employees were working. The sectors that are most strongly affected by seasonality are, as would be expected, more likely to result in an exit to non-employment. Thus, working in the viticulture sector increases the probability of experiencing an interruption in employment. And in a sector that mobilizes almost half of seasonal contracts every year,[16] the probability of having one's seasonal contract renewed is, in average, greater than in other sectors.

The results suggest that the local employment conditions can influence the nature of transitions from seasonal contracts. Thus, a high rate of agricultural jobs can favour remaining in a temporary job and, conversely, reduce a person's chances of exiting the agricultural sector. As expected, we also observe a negative relationship between the rate of industrial jobs in the area and the probability of finding another job in agriculture. Being far away from large or medium-sized centres reduces the probability of moving to non-employment. Given that agricultural jobs are for the most part located in isolated rural areas, the distance to a major centre may more reflect the structure of jobs available in the area. Conversely, living in an area that is far from a centre decreases the chances of finding a job outside the agricultural sector. Lastly, the results show that a high unemployment rate reduces the chances of having one's seasonal contract renewed. When the unemployment rate is high, the employers may have an easier access to other workers, in the hope that they can improve the quality of the worker-job match.

We are particularly interested in the effect of an individual's previous career path on professional transitions, and to introduce indicators to measure the number of temporary contracts and the number of employment breaks already accumulated in the course of the professional career. On the one hand, the number of employment breaks increases the chances of being in a situation of non-employment but has a relatively little impact on the chances of finding another temporary job in agriculture. On the other hand, the number of temporary contracts increases the probability of finding another job of this type and limits the risk of becoming unemployed. Conversely, a good level of experience in agriculture gained through an accumulation of temporary contracts does limit the chances of exiting the sector. Thus seasonal contracts seem to be concerned with a form of specific capitalization which can then be applied in the sector of activity (Becker 1976) and which is difficult to transfer to other sectors (Becker 1976; Gullstrand and Tezic 2008). The best way of finding another (temporary) job in agriculture would therefore appear to be via a career path that consists of a succession of jobs of this type.

Basically, different variables affecting the duration dependence enable us to explain how the time spent in a seasonal job affects the instantaneous probability of exiting it. First, the variable ln*(time)* shows that the time spent in a seasonal job increases the probability of leaving it, whatever the subsequent destination state. In the previous sub-section, a non-parametric approach using the Kaplan-Meier plot suggests that duration dependence has a non-linear effect. Indeed, the instantaneous exit rate from a seasonal job is significantly higher at 3 months and 6 months. We therefore include 3 dummy variables to show whether or not the seasonal contract is still ongoing at each interval. Although the risks of exiting into non-employment are at their maximum after three months, the employment prospects improve after six months. Thus the probability that a seasonal contract will be followed by another temporary contract increases with the duration of the ongoing contract and reaches a maximum when it comes close

[16]Source: CCMSA

to the maximum legal duration. Finally, the longer the seasonal contract, the more likely the worker is to remain in a temporary job in the agricultural sector. In the case of a transition to a non-agricultural sector, the risks of exiting decrease and then increase after 6 months. Nevertheless, these risks of exiting are relatively low, reflecting the work of Becker (1976) and that of Gullstrand and Tezic (2008) who stress the difficulty of transferring a specific know-how. The longer a worker's experience, the more difficult he/she will find it to exit the agricultural sector.

Lastly, we consider the effect of the unobserved heterogeneity on the risk of exiting a seasonal contract. To do this, we specify two mass points, indicating that agricultural workers can be divided into two categories. The coefficients associated with the mass points show that one group of seasonal contract workers has a higher probability of leaving agriculture. The result is a relatively higher coefficient for the mass point relating to exiting to a job outside agriculture. Since it represents only 34% of the sample, this group is in the minority. The coefficients associated with the second group are negative for leaving the agricultural sector and positive for a transition into non-employment or another temporary contract. In other words, workers in the second group are more likely to move into a period of non-employment or to have a series of short-term contracts, and are less likely to leave agriculture. Thus the vast majority of seasonal workers have a little chance of getting out of the agricultural sector.

Table 5 presents the results from the same model applied to the NSTC sub-sample. As was the case for workers with a seasonal contract, the youngest workers are more likely than their older counterparts to be in a situation of non-employment or to hold a succession of jobs of the same type. As expected, the men are more likely to find a stable work in agriculture after a period on a NSTC. The positive link between human capital and leaving agriculture is validated once again: the most highly qualified workers are indeed more inclined to leave the agricultural sector. The employees in supervisory jobs, white-collars or skilled blue-collar workers, on the other hand, are less likely to find a stable employment than unskilled workers. The differences in the job supply in the different employment sectors certainly play a role here, as the agriculture offers jobs that often provide little in the way of qualifications.

While the viticulture sector tends to result in a move back to non-employment for seasonal workers, in this case it seems, on the contrary, to be promoting stabilization. In this sector, seasonal jobs often involve picking, packing, etc., which require very few qualifications and which therefore attract an "interchangeable" work force. The NSTCs should apply to jobs providing more qualifications (such as pruning or sale), which are not limited to simply carrying out a series of tasks. It would be very much in a farmer's interest to retain workers via a permanent job.

Concerning the effects of local characteristics on transitions, the estimates suggest that the agricultural employment rates in the employment area favour the transitions to non-employment or to another temporary job. A high rate of industrial jobs, on the other hand, reduces the risk of experiencing unemployment. Thus the level of competition between the agricultural sector and other sectors enables agricultural workers to remain in employment. However, the results do not indicate the type of work found.

An individual's past career has an expected effect on the type of transition from a NSTC. Thus the number of temporary jobs already accumulated increases the probability of finding a job of the same type while reducing that of being in non-employment. The number of employment breaks reduces the chances of remaining in the temporary employment and increases the risk of non-employment. These variables therefore follow the mechanisms already highlighted by the previous estimate. However, we note that the past career has no impact on the chances of stabilization. This result suggests that the stabilization can be explained more by the characteristics of the farm than by those of the workers. The hypothesis put forward by Gagliarducci (2005), whereby it is not the succession of temporary jobs that poses a problem but rather the discontinuity that it implies, is validated when the job that follows the NSTC is a temporary one.

Overall, the time spent on a NSTC significantly increases the chances of experiencing a transition. We take the time effect into account by including a flexible baseline hazard with steps of 3, 6 and 12 months. We observe that the effect of the duration on the likelihood of transition is fairly similar to that of the seasonal contract. The risk of exiting to non-employment is at its maximum for the shortest contracts, i.e. those of less than 3 months, and this risk then decreases and is at a minimum for those longer than 12 months. Conversely, the probability of having one's contract renewed is minimal for the NSTCs of less than 3 months and increases for the longer durations. The chances of achieving stability are also greater for those with a contract of a long

duration. The probability of converting a NSTC to a permanent contract increases as it gets closer to the maximum legal duration, which is therefore another determinant of stabilization in agriculture. Finally, those with a NSTC are more likely to exit the sector after a certain amount of time spent in agriculture. Whether workers have a NSTC or a seasonal contract, the risks of exiting to another sector are relatively low.

Lastly, we deal with unobserved heterogeneity, again by assuming two categories of agricultural

Table 5. Estimate of hazard rates: NSTC

	NSTC-NE		NSTC-TC		NSTC-OAC		NSTC-PC	
	coeff.	std. err.	coeff.	std. err.	coeff.	std. err.	coeff.	std. err.
Age range (ref: 31–40)								
Under 21	0.425***	0.079	0.439**	0.137	0.103	0.196	–0.333	0.257
21 to 30	–0.042	0.065	0.046	0.117	0.087	0.139	0.328	0.189
41 to 50	–0.062	0.084	–0.131	0.160	0.161	0.173	0.146	0.250
Over 50	0.062	0.100	–0.129	0.190	0.309	0.213	–0.485	0.36
Male	–0.059	0.051	0.074	0.093	–0.063	0.107	0.496**	0.159
Type of post (ref: Unskilled)								
Skilled worker	0.179*	0.089	–0.139	0.146	0.498	0.262	–0.704***	0.198
White-collar employee	0.007	0.105	–0.412*	0.184	0.211	0.291	–0.866**	0.271
Supervisory post	–0.006	0.086	–0.203	0.138	0.691***	0.248	–0.946***	0.184
Nature of farm activity (ref: Viticulture)								
Cultivation/Livestock	0.205	0.123	–0.438*	0.197	–0.305	0.331	–0.324	0.270
Cereals	0.101	0.107	–0.322	0.170	–0.196	0.259	–0.744**	0.251
Fruit/Vegetables	0.174	0.108	–0.189	0.175	–0.203	0.259	–0.694*	0.274
Other	0.345***	0.088	–0.309*	0.141	0.365	0.202	–0.505**	0.196
Agriculture employment rate	1.302***	0.265	1.881***	0.482	–0.352	0.654	0.546	0.794
Industrial employment rate	–1.197***	0.299	1.211*	0.507	–0.612	0.642	–1.08	0.857
Agrifood employment rate	0.589	0.517	2.734**	0.888	–0.623	0.920	2.350	0.984
Distance to nearest urban centre	–0.002*	0.001	–0.005*	0.002	–0.005*	0.002	–0.005	0.003
Unemployment rate in employment zone	0.034***	0.012	–0.03	0.223	–0.05	0.027	–0.089*	0.035
No. of temporary jobs cumulated	–0.065***	0.010	0.107***	0.015	–0.110***	0.023	–0.009	0.031
No. of employment breaks cumulated	0.160***	0.015	–0.135***	0.029	0.255***	0.029	–0.021	0.047
Duration dependence								
ln (time)	0.447***	0.053	0.413***	0.095	0.705***	0.139	1.033***	0.244
< 3 months	–3.606***	0.172	–5.626***	0.342	–5.423***	0.503	–5.612**	0.613
3–6 months	–3.996***	0.166	–4.639***	0.393	–5.784***	0.577	–5.029**	0.750
6–12 months	–3.965***	0.117	–4.536***	0.449	–5.325***	0.623	–4.697	0.532
>12 month	–4.074***	0.176	–3.776***	0.471	–4.962***	0.683	–3.672**	0.547
Unobserved heterogeneity								
Type 1 constant	–0.871		–1.096		–1.239		–1.846	
Type 2 constant	0.641		2.375		0.221		1.261	
Type 1 probability	0.38							
Type 1 probability	0.62							

Significance level: ***1%, **5%, *10%

workers. In the first group, representing 38% of the sample, the coefficient associated with transitions to non-employment is the highest while that associated with transitions to a permanent job is the lowest. The first category is represented by workers for whom it is relatively more difficult to find a job, either in agriculture or not. Workers in the second category, however, are more likely to find a job, especially in the agricultural sector. Coefficients associated with the transitions to another temporary contract or to a permanent one in agriculture are relatively higher. The second group represents 62% of the sample, demonstrating that the majority of workers have relatively little difficulty finding a job in the sector.

CONCLUSION

The main objective of this study was to analyze the role of temporary contracts in agriculture related to the probability of remaining in employment. We also considered the effects of the workers' past career on transitions from the temporary contracts. To do this, we used an original database created by the MSA (Agricultural Social Mutual Fund). In order to consider the heterogeneity of these temporary jobs, we separated seasonal contracts, which have their own specific characteristics, from the non- seasonal temporary contracts.

We applied a discrete-time competing risks duration model to both sub-samples, the seasonal contracts and the NSTCs. We first demonstrated the importance of the individual characteristics on the likelihood of exiting the agricultural sector. Whether the contract was seasonal or not, the probability of finding a job outside the agriculture sector was significantly higher for the best qualified workers. This confirms the idea that skills are highly valued across the labour market. Although we observed no gender effect in the case of the NSTCs, men are more likely to find themselves in non-employment when the contract is seasonal. This result is certainly linked with the characteristics of seasonal jobs in agriculture, which are often done by women, are poorly paid and provide little in the way of qualifications. We also considered the effect of the previous jobs on constructing transitions. On the one hand, the probability that a worker will find another temporary job increases with the number of jobs of this type already accumulated in the course of his/her career. On the other hand, it decreases with the number of the employment breaks. However, the link between professional past and access to a permanent job was not established. Stability in agriculture would seem to relate more to the characteristics of the farm than those of the worker. Finally, we demonstrated the time-dependent phenomena for transition probabilities. Whether the temporary contracts were seasonal or not, the job prospects improved for the longest contrasts. More specifically, rates of conversion of the NSTCs into the permanent contract were higher when they were approaching their maximum legal duration. Lastly, we showed that the likelihood of exiting the agricultural sector was relatively low. Agricultural jobs tend to generate a specific know-how which is difficult to transfer to other sectors (Becker, 1976).

In a sector where the needs for flexibility are evident, especially as it is so nature-dependent, the job stability cannot be seen only as the access to a job with a permanent contract. At present, a succession of temporary contracts may resemble a form of job continuity, especially when there are few job interruptions. In order to make it easier to hold one temporary job after another, with no interruptions, the public policies would be well-advised to ease the legal constraints that create such a burden on the longest temporary contracts, notably by abolishing the grace period required between two successive contracts. However, some kind of sector differentiation should be applied. In the specific case of jobs with a NSTC, some activities are particularly suitable for the stability once the maximum legal duration has been reached. It would then no longer be a matter of making contracts more flexible but making them stricter, especially by reducing the maximum legal duration. Training programs are also a possibility for the least qualified workers, who would then be more inclined to move out of the agricultural sector in periods of unemployment.

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