1. Introduction

In the last two decades, a number of countries have exhibited high in- and out-flows of union membership (Labbe & Croiset, 1992; Martinez Lucio 1998; Miguélez 2000; Frege and Kelly 2004). Spain is a prime example of this phenomenon, where levels of annual membership in-flows and out-flows above ten percent of overall membership have been documented, indicating particularly dynamic union membership[1] (Alós et al. 2011). Although enlightening, the aggregated data does not indicate whether there is only a progressive renewal of the membership or an increasing pluralization of union membership trajectories as well. For the latter, we would expect asymmetries in membership trajectories. Put simply, some workers would experience stable and linear trajectories, while some others would experience short memberships or constant disruptions and re-entrance to membership. To explain these asymmetries from micro-level perspectives, studies on union memberships have distinguished a wide range of characteristics and reasons behind entering (Lange et al. 1982, Visser 2002, Guest & Conway 2004, Waddington & Whitston 1997) and leaving the union (Klandermans 1997, Guest & Conway 2004, Lévesque et al. 2005, Waddington 2006). However, these analyses are largely static; identifying membership status and determinant characteristics for a discrete interval of time.

In this paper, we present a more dynamic approach and analyze membership trajectories to understand membership dynamics and complement knowledge on membership turnover to inform membership retention policies. As an initial step we look at the length or duration of memberships (i.e., the link between the joining and leaving events in a time axis). The underlying premise is that although all union

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[1] In some countries the equally high rates of joining and leaving implied the maintenance, or even slight increases, of membership levels over time. This is also the case of Spain where union density remained stable at around 17-20 percent of the labour force since the mid-90's (Beneyto, 2011).

members will end up leaving the union, some members will exit sooner than others. The latter is what we want to test and we expect our results on duration of membership to go in line with previous findings indicating a divide between membership groups experiencing both higher entrance and leaving rates (e.g., youth, women, and foreigners) and those with more stable memberships (Alós et al. 2011).

A comprehensive examination of the length of membership requires the application of longitudinal methods for the analysis of durations (i.e., survival analysis) (Blossfeld et al. 2007). This goes beyond the traditional analysis of membership tenure (i.e., length of stay of current membership), as the outcome of analysis is the proportion of members who remain in the union over membership time, including those currently members and non-members. The empirical results allow responses to the following questions:

1) How many union members remain after a given interval of membership duration since joining?

2) What are the intervals of membership duration with the highest risks of union attrition?

3) Which personal-, labor-, and union-related characteristics associate with shorter or longer membership durations?

Analyses of membership duration for the Spanish case are somewhat of a novelty. We use archival data of membership registries of one of the largest Spanish union federations: *Comisiones Obreras* (CCOO). Membership turnover and membership duration are relevant objects of analysis for this case study as a centralized membership registry (at the union federation level) and gradual conversion to a social partnership model and servicing organization (also for the non-employed) weakens the linkage between job change, and/or termination, and membership

withdrawal. Although a minority, the CCOO data includes unemployed and retired persons in the membership counts.

We focus on a sample of members who joined the union after January 2005, while leaving is restricted to an observation window for which we have individual level data on union withdrawal (between January-October 2009). The greatest advantage of using the registries is the ability to account for the whole population of membership leaves for the period (160,000 leaves). To obtain unbiased results of the duration analyses, we compare the durations of leaves with those who remained members by the end of the observation window of our study (October 2009), which account for more than one million observations. The results of our analyses indicate that shorter membership duration is associated with workers in peripheral positions of the labor market. This is mostly youth, foreigners, and workers based in firms, economic sectors and territories where economic activity associates with seasonality, unsecure employment and where union presence is rather low.

2. Spanish industrial relations, CCOO, and the evolution of union membership composition.

In this article we analyze the membership of one of the two main unions in Spain, *Comisiones Obreras*. CCOO is a union federation, encompassing salaried workers from all occupational and economic activity sectors, with a functional structure of activity branches within territorial organizations. The origins of the union are based on industrial tradition. However, as with other European counterparts, union membership in CCOO has evolved to mirror the occupational structure of the Spanish labor market. Workers in service activities are currently the majority, with a strong incidence of public sector workers. Moreover, in the last decade, the presence of

women and immigrants has increased. These groups – together with younger workers, workers with unstable job contracts, and those in companies without union presence – remain underrepresented.

The evolution of the current membership composition reflects internal and external changes since the legalization of unions in Spain (1977). With a union density of 18% at time of legalization, membership of Spanish unions initially declined (1977-1980) and fluctuated during the 80s due to the economic cycle and the early stage of institutional consolidation, or the transition from *informal movements* towards *formal organizations* (Jordana 1996). A union strategy oriented towards legal recognition reduced resources which could have otherwise been utilized for membership attraction and retention. Moreover, the relative importance of unions in Spain is not measured by the membership size, but by the result of union representatives' elections at the firm level.[2] Together with *Unión General de Trabajadores* (UGT), the second largest union federation with similar structure and composition, CCOO controls approximately three quarters of union representativeness in Spain (38.8% CCOO, 37.1% UGT) (Beneyto, 2011). In addition, some features of the legal framework, the *Workers' Statute* of 1980, determined the persistently low union density (Hamann, 2001; Fernández Macias, 2003). These are, the workers delegation of bargaining rights in a *dual representation* system that allows both, membership (*Sección Sindical*), and non-membership firm-based workers' representation (*Delegado - Comité de Empresa*), and the *erga omnes* institution that enhances free-rider mentalities. That is, the extension of union bargaining outcomes in the functional and territorial setting where bargaining takes place independently of

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[2] Traditionally the union receives more financial resources from the state due to their representativeness measured by the outcomes from worker representatives' elections than from membership dues.

whether workers are members or not (Miguélez et al. 1991). [3] To illustrate this fact, although the union density of both CCOO and UGT is only around 20%, their bargaining outcomes, mostly from sectoral levels of negotiation, affect between 80-85% of all salaried workforce. [4] As a result, Köhler and Martin (2005) indicate that incentives to join and remain in the union, at this stage, are based on union identity – principally male workers in large industrial companies and unionized environments.

In the mid-80s, the break with prior political affiliation (leading to the start of the long term collaboration between both union federations), a progressive formalization of the organizational structures, and a favorable economic and political context led to rising membership levels for both union federations. In addition, these same circumstances led to their legitimization as social partners, culminating in the general strike of 1988 (Hamman 2001, Hamman and Martinez Lucio 2003, Alós et al. 2011). The steady increase of membership in CCOO since has been linked to a turn from a reactive to a pro-active attitude. This has induced new strategies on the quantity and quality of employment.

Adapting to the increasing segmented labor market (Toharia 2011), specifically labor reforms that introduced fixed-term contracts and the dramatic increase of women and foreigners in the labor market, the union launched recruitment programs targeting these groups. [5] New membership groups feature vulnerable job situations in comparison to traditional membership due to insufficient employment protection and the persistent high costs of collective action derived from lack of union

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[3] This fact suggest that the relative strength of unions is measured more by elected representatives in work councils than by the membership size.

[4] Both unions engage, usually in unison, in almost all collective bargaining in Spain.

[5] It is worth to say that a dualisation of employment conditions, separating secure from insecure positions, have been found to be very strong in the Spanish case (Banyuls et al. 2009), which boasts one of the largest rates of fixed-term employment contracts within western economies. Although the proportion of non-permanent contract workers increases in the membership, their levels of membership still do not mirror their levels in the labor market yet (Alós et al. 2011).

presence at the work center. The gradual growth of non-traditional membership has been encouraged by the introduction of elements of a social partnership model and the extension of services (e.g., training and legal representation). This has coincided with slight retention of members experiencing non-employment situations (e.g. first job seekers, unemployed or retirees have reduced dues). Since the 1990's, among those joining the union, there are more materialistic incentives connected with the decision to join than those found among older members who boast more stable job situations and are more likely to work in unionized environments (Alós et al. 2011).[6]

3. Membership Trajectories, Membership Duration and the Analysis of Duration Data.

Membership dynamics can be understood as the interdependence of membership trajectories (i.e., the process starting at the time of joining and finishing when leaving the union). A comprehensive analysis of membership trajectories should at least cover and connect the recruitment process with the initiatives that ease or impede membership retention. Such an analysis should also cover the causes that lead to union exit, or the reasons members commit to the union for variant periods of time (Alós et al. 2011). However, due to data limitations, little research on the interconnected stages of membership in relation to membership dynamics has been carried out (Schnabel 2003).

The temporal continuity between these stages leads us to consider the length of membership (i.e., between joining and leaving) as an object of analysis in order to introduce initial evidence on how membership trajectories appear and whether we find systematic differences across union members. Some empirical literature has begun to

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[6] Swaping between main union federations (CCOO and UGT) is considered a usual practice depending on which one is present in the firm or, when both are present, depending on which offers more attractive services.

analyze membership duration. Vaona (2008) presents an analysis of union duration for 29,035 members of the Italian union CGIL, belonging to two counties of the Veneto region. Using OLS regression, where the dependent variable is membership tenure, Vaona finds that younger, female, foreign, and flexible workers are more likely to be recent members. Their shorter membership tenure, the author suggests, can be accounted for, on average, by inferior working conditions and vulnerable labor situations. Van Rij and Saris (1993) present an event-history analysis (a.k.a. survival analysis) of duration until joining the union, and as well as duration from joining to exit. Using data from the Netherlands, they find that most exits occur with shorter rather than longer membership durations. The risk of leaving diminishes progressively the lengthier the individual membership is. Buttigieg et al. (2007) conduct a similar analysis embedded in the Australian context. They find that shorter membership durations are related to non-unionized environments (i.e., no presence of a union at the firm level), individualistic orientations (i.e., usefulness of the union on achieving gains for the individual), and also when the individual perceives that the procedures designed to determine labor outcomes are ineffectual.

Characteristics of membership leave for the case of CCOO (Alós et al. 2011, Jódar et al. 2011), as well as for other institutional settings (Gallie 1996, Waddington and Kerr 1999, Visser 2002, Waddington 2006), are similar to those of shorter membership durations in the aforementioned studies. Women, younger and older age groups, foreigners, fixed-time contract situations, shorter service lengths, and workers in small firms or without union representatives are highly associated with leaving the union (Alós et al. 2011).[7] In general, contextual changes pertaining to job situations

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[7] Males of adult age, manufacture work, large companies, and workers in unionized working-environments are less likely to leave the union and associate with high compromise with the union and take responsibility positions, like union delegates. These workers also feature the much smaller fraction of union leaves who reasoned leaving the union with disagreement with the union organization,

produce the majority of union withdrawals independently of the initial commitment of members to the union (Klandermans 1986, Visser 2002). This is also the case for around half of leavers in CCOO (Alós et al. 2011). Although some would be tempted to sustain that stable careers lead to commitment to the union over time, evidence remains weak for such an assertion. Our aim is more reserved, as data do not allow accurate determination of the employment situation or repeated memberships over time. Instead, we offer a robust test on associations between the information provided at the time of membership registration for which we were able to derive variables and membership duration. The underlying hypothesis is that: women, youth (and workers of older age), non-Spanish nationals (as highly representative demographic groups of peripheral positions), those working in sectors of economic activity and regions with higher incidence of insecure employment and lower union tradition, and workers in firms with few or no union members will leave the union within shorter periods of membership than the average.

To test for pluralization of membership trajectories and to observe nuances of segmentation theory, we assume a further alternative: the membership typology of Alós et al. (2009). This typology features four status-consistent groups reflecting the multidimensional aspects behind diverse groups of members and discerns the segmented Spanish labor market.[8] The largest group, the *traditional-core*, is comprised mainly of men, employed in private industry, in medium- to large-sized workplaces, with high seniority. A second group of members, the *emerging-core*, is comprised of workers with high educational attainment, working as technical staff in public services or private skilled service companies. Both groups, to be found in the

priorities on union strategies, the union ideology, or alternatively by lay-off and pre-retirement (Alós et al. 2011).

[8] Membership groups were created using personal, work and firm related information reduced to a few dimensions reflecting consistency across characteristics and with a posterior clustering of individuals according to the dimensions (see Alós et al. 2009).

unionized context, boast the largest rates of union activism (Jódar et al. 2011b); therefore, longer memberships are expected. A third group, the *peripheral-in-transition,* is composed of young male workers with low seniority. Finally, there is a small group of *peripheral* members, mostly women with elementary or no education, and with no expectations of promotion. They are characterized by lower activism and claim employer hostility towards union (Jódar et al. 2011b); we therefore expect shorter memberships.

In this research we also employ survival analysis methodology because of its analytical superiority over traditional regression methods for the object of analysis here proposed.[9] Survival analysis is the set of statistical techniques adequate to examine and model duration data (also time-to-event or spell data). This is the time span stretching from the beginning of a status until its end (e.g., the length of a membership spell). Technically, this measures the time that it takes until event occurrence or a transition between statuses from when the individual starts to be exposed to the *risk* of event occurrence or changing status.[10] For instance, the risk of leaving the union starts at the very moment the individual becomes union member, and not before. There are two main results of interest: the *survival probability* (i.e., the proportion of individuals who did not experience the event after an interval of time from the onset of the risk exposure event), and the *hazard rate* or *transition rate* (i.e., the probability of experiencing an event at a given time interval, conditional on not having experienced the event before; e.g., since joining the union).

We mention three key features and advantages of the method. First, while traditional analysis of membership turnover average out when union withdrawal

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[9] In the empirical literature different names are used to refer to the same methodology, e.g. event-history analysis, duration analysis or transition-rate analysis.

[10] Risk and risk set are traditional terminology in survival analysis that merely refers respectively to non-zero probability and population with non-zero probability of event-occurrence. The name derives from initial analyses done to measure death timings in epidemiological literature.

happens, survival methods offer a wide range from parametric to non-parametric techniques to examine the shape of time functions for survival probabilities and hazard rates. These techniques account for the fact that durations are always positive and their distributions are skewed (e.g., members become more committed over time).

Second, survival analysis accounts for durations of those who left the union as well as those who are still members. The later are called *censored cases* and are analytically important as their inclusion eliminates endemic bias in non-survival analysis designs. Although we do not observe when censored cases leave the union, accounting for the length of their membership by the end of the observation period corrects the results for selective features that lead to late leaving across union members.

Third, survival analysis allows identification of individual-, labor-, and union-related characteristics associated with short-term memberships and those which lead to long-term commitments. In addition, inclusion of characteristics that vary over time (e.g., employment status) is possible to offer evidence on the interdependence of membership duration with changing conditions (e.g., family situations, employment conditions or the relation with the union).

4. Data

For our analyses, we use data from two registries on CCOO membership accessed at the Revenue Administration Unit of the union federation CCOO. The data is provided by each territorial unit of the central organizational unit of CCOO in Spain. The first of the registries covers information for all members who left the union between January and October 2009. This amounts to 160,367 observations. Leaves in the registry are measured as those individuals who contacted the union and informed

them about the wish to leave it, and those individuals who did not pay union dues for six consecutive months. To complement the leavers' population, we use the registry of members as of October 31, 2009. This amounts to 1,092,284 observations.

Due to the data limitations, we are compelled to apply some restrictions to our sample and restrict the interpretation of our results. First of all, our results cannot be separated from the period effect behind the determinants of leaving throughout the year 2009.[11] This was a year were membership was particularly affected by layoffs and a reduction of new employment in the labor market coinciding with the second year of a world financial crisis. Second, our *observation window*, the period when leaves are observed, is rather short if the analysis is strictly focused on those who joined and left within this period (i.e., membership under one year). Allowing for the introduction of observations for whom we observe the leaving date within the observation window, but who joined before the start of that period, can lead to *left-truncation* bias. That is to say, while we allow individuals that joined the union prior to January 2009 to enter the analysis, we omit those who joined at a comparable date but left the union before January 2009. Thus, shorter durations of membership are under-represented in the analyses. Larger bias increases the risk of leaving concentrations in shorter durations. Being informed about this shortcoming, we decided to include in our analyses those individuals who joined the union after 4 years before the observation window (i.e., January 2005).[12] We regard this as a sufficient time period to avoid large biases in our analyses.[13] To shed some more light on possible bias due to left-truncation, we will run two parallel analyses; one for members who joined from January 2005 onwards, and another only for those

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[11] Employment seasonality is not relevant in our analysis as we account for union leaves during almost the whole year 2009.

[12] Those who joined before Jan 2005 accounted for 54% of the initial population.

[13] Cain et al. (2011) suggest that the lower the proportion of left-truncated cases the less the bias we introduce into the results.

observations representing members who joined from January 2009 onwards (i.e., no left-truncation). The differences between the results for both samples are good indications for the direction of the biases.

We disregarded from the analyses those members not living in Spain, those who live in the North African Spanish territories of Ceuta and Melilla (below one percent of initial population), and those over age 70 (two percent of initial population). With the application of these restrictions, our population for analysis is reduced to a sample of 547,168 individuals who joined between January 2005 and October 2009. By the 31st of October, 2009, 97,841 individuals left the union and 449,327 decided to remain.[14]

5. Data analysis

From the membership register we derive the following variables that feature the outcome of interest for survival analysis:

Membership duration: Time in months since observation of last membership joining. Only for those who joined after first of January 2005 and are still members, at least, until January 2009.[15]

Censoring indicator: Dummy indicator that takes the value 1 when union leaving is observed between January and October 2009, and the value 0 when no leaving is observed (i.e., s/he is still a member by the end of the observation window).

We also use other information available in the membership registry to construct covariates, which the literature finds relevant to predict union leaves (See for example: Alós, et al. 2011). For the sake of reliability, we will only use

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[14] And having remained as union member until January 2009.
[15] For the complementary analysis without left truncation we analyze those members who joined from January 2009 onwards.

information that was taken at the time of registration (i.e., the last time a member joined the union). Among others we use information on:

Sex: Dummy indicator that takes value 1 for females (reference: 0 – males).

Age: Four dummy variables for age-ranges (16-29, 30-44, 45-59, 60-70).

Citizenship: Four dummy variables indicating the following citizenship groups: Spanish, African (mainly North-African), Latin-American and other citizenships.

Activity branch: Twelve dummy variables encompassing sectors of economic activity with common collective bargaining outcomes.

Regional unit: we use seventeen dummy variables identifying the union regional units.

Union members at the firm: Up to five dummy variables indicating the number of union members at the firm level (1-5, 6-25, 26-100, 101-500, >500) and another variable indicating "no members" for non-employment situations (mainly unemployed and retired members), but also missing observations.

Membership channel: We grouped several channels in two main types: 1 – *worker self-register* (including passing by union quarters, telephone, mail and internet) and 2 – *via union contacts* (including union representative in the company, visit of union representative from union quarters, and other forms of campaign).

We will use two well known techniques within the survival analysis family. First, non-parametric techniques for the estimation of survival probabilities known as Kaplan-Meier (KM) estimators (Kaplan and Meier, 1958) will be calculated and plotted as survival curves for each covariate category. KM estimates offer a simple and efficient estimation of the survival function, or the probability that leaving the union has not occurred at a given duration interval since the beginning of the

possibility to experience the event. This will provide insight on the duration until exit for different membership groups.

Second, we will apply Cox regression (Cox, 1972), a semi-parametric regression model for survival data, which estimates in a multivariate setting how membership groups raise or reduce the risk of membership withdrawal over time. [16] The membership duration is cancelled out in the mathematics of the model and not a relevant result. The influences of the covariates introduced into the model on the hazard of leaving the union are therefore constant over time. This is known as the *proportional hazards* assumption (Blossfeld et al. 2007), and may not apply if, for example, we suspect that a certain covariate increases the hazard of leaving the union at the beginning of membership duration and decreases by the end. However, we test that assumption confirming proportionality of the effect over duration intervals for the great majority of covariates[17].

6. Results

6.1. Survival curves

We first present the description of the average membership duration by personal-, labor-, and union-related characteristics. We present survival probabilities estimated by the Kaplan-Meier method, which can be interpreted as the proportion of members remaining in the union in a given membership duration interval (e.g., the proportion of those still members after 6 month of joining). On average, we find that after 12 months more than 10% of the membership left the union. The result suggests that there is a high turnover among recent joiners, most probably due to the change in the job situation or after the use of union services (Jódar et al. 2011). The rest of the

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[16] Cox-models are sensible to ties, that is to say that many cases share the same event time. We apply the Breslow method to eliminate this issue from our analyses (see Breslow, 1974).
[17] Only older ages (60-70) present a non-proportional pattern as we will comment later.

descriptive results are presented graphically as survival curves (i.e., survival probabilities in the Y-axis over all observed duration intervals in the X-axis) by different categories. The Wilcoxon test is used to assess the significant differences between survival functions.

In Figure 1, we show survival curves of membership duration by sex, age and citizenship. First, patterns of leaving for men and women over duration intervals are not noticeably different; though men have durations of membership which are marginally shorter than those of women, and the difference is statistically significant. The result confirms what others found: the effect of the economic crisis on women's joining and leaving rates has been delayed (Jódar et al. 2012).

Second, there is a clear difference in the levels and speed of leaving between the youngest age-group (i.e., 16-29 year olds), clearly the most vulnerable, and other age groups. 25% of the youngest age-group left the union before the second year of membership, and about 60% had left the union by the fourth year of membership. These levels are much lower among other age groups. In order, the second (30-44) and third (45-59) age-groups present moderate levels of disaffection, with relatively less incidence at shorter durations than the younger age-group. The oldest age group (60 and more) displays low intensities of leaving at shorter durations of membership, but very high intensities at longer ones. Leaving after retirement, at age 65, might be the reason behind the observed pattern of the oldest age group.

Differences by citizenship are also discernable. We confirm the results of Jódar et al. (2011) in Catalonia, where non-nationals are more likely to leave the union. In particular, more than 75% of the non-Spanish citizens who joined between 2005 and 2009 left the union in 2009, while this percentage is reduced to 25% for the

case of Spanish citizens.[18] The magnitude of this result substantiates evidence which indicates that the economic crisis has substantially affected the employment situation of non-Spanish citizens.

Figure 2 presents survival curves for activity branches. There are activity branches that clearly suffer more membership losses, and particularly faster, than the others (i.e., at shorter durations people are more likely to leave). They are the construction branch and the retail and other personal services branches, respectively. These activity sectors, boasting high rates of seasonal employment, were decidedly exposed to economic difficulties derived from the economic crisis of the period of study (see Toharia, 2011).

Figure 3 presents survival curves by regional units. Differences are not very important, but we find an initial high attrition among the Balearic Islands, Canary Islands, Valencian Community, Murcia, and – to a lesser extent –Andalusia and Castille-La Mancha. Most of these regions share a high percentage of their workforce devoted to personal services, high levels of seasonality and work insecurity, and less union tradition.

The most striking differences are presented in Figure 4 and relate to the level and rate of leaving regarding the channel used for joining the union. We employ the term *union contact* register when a union contact (e.g., union representative at the firm) was directly involved in the registration of a member, and a *self-register* in lieu of this situation. Those who join by self-register have relatively larger levels of attrition during the first five years than those joining by union contacts. In particular, half of the members who joined by self-register are likely to leave the union before the fifth year of membership. Although self-registered workers may also have

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[18] Jódar et al. (2011) indicate that employment stability, membership length and acquiring Spanish citizenship are much correlated facts that may explain worse outcomes of immigrants when using a citizenship measure instead of country of birth.

contacts in the union, this membership channel reflects non- or less unionized environments and higher membership vulnerability.

Last, in Figure 4, we also present survival curves according to the size of membership at the firm level. For those cases coded in the registries as 0 union members in the firm, we cannot distinguish those who are not employed from those who did not provide information on membership size. First, those in missing information / non-employment situations (i.e., unemployed, retired and other pensioners) present shorter membership durations than those in employment. In particular, half of those registered with no information about membership size are likely to leave the union before the fourth year of membership. This suggests that most of them are to be found in non-employment situations or very small firms. Among the employed, the number of union members at the firm presents minor differences on the duration of membership when compared to not being employed or not having information on the membership size.[19] The more union members a firm has, the longer the average duration and the lower the attrition rate is after five years of membership. This result confirms that workers in a unionized context have lower probabilities of leaving.

6.2. Cox regression

In the subsequent paragraphs we present the results of the Cox regression to highlight the effects of the covariates described above on leveling the risk of union leaving, controlling for all variables in the same model. The variable *membership channel* will be excluded from regression analysis due to the high degree of missing

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[19] We found a significant association between the category of non-employment/no information on membership size and the worker self-register as a membership channel. This is due to those who do self-register do not always report on firm identification number, by which the firm's membership size is obtained.

information in the registry.[20] We also exclude those over age 60, as this category violates the *Proportional Hazards* assumption of Cox regression models commented above. This omission forces us to omit the union branch for renters. No variable indicating period of joining/leaving (i.e., calendar year) is included, as the observation window of leave takes place only in 2009; therefore, a period variable would be collinear with the duration of membership. The coefficients of the covariates in the analysis are presented as hazard rates (i.e., exponentiated coefficients) and represent higher hazard of union leaving than the average (when the hazard rate is above 1), or lower hazard (when the hazard rate is below 1). The positive or negative effect of the covariates is presumed to be constant over all membership duration intervals.

In the second column of Table 1 (i.e., *joining since Jan. 2005*), we present the results for a model where members joined after January 2005 and were leaving between January and October 2009, or stayed in the union after October 2009. Regarding socio-demographic variables, the results of the regression analysis validate, *ceteris paribus*, those of KM estimation. Those with citizenship other than Spanish have twice the hazard rates of leaving the union at each duration interval. Young people (under 30) have an exponentiated coefficient of 1.74, which means that members under age 30 are 1.74 times more likely to leave the union at any duration interval than members in the age-group 45 - 59. Likewise, the age group 30-44 is 1.23 times more likely to leave than those aged 45-59. *Ceteris paribus*, women are only marginally more likely to leave at each duration interval than men. This confirms that socio-demographic characteristics associated to peripheral employment situations in the labor market are more likely to leave the union at any given time.

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[20] Missingness on this variables is particularly important in some regions (e.g. 95% of responses is missing in Catalonia), as the collection of data is done by each regional unit.

Regarding the activity branch, only those dealing with welfare services (e.g., education and health), or those of financial services, have lower risk of union exit for all time intervals when compared to the largest one (i.e., Public administration). Members in other branches present higher risks of leaving than the reference category, with construction and retail & personal services branches exhibiting particularly high leaving hazards. We took Andalusia, the largest unit with a higher level of members working in personal services, as a reference category for the regional unit. As for the activity-specificity of the reference category, we find that most of the coefficients for the other regions show lower hazards of leaving. This holds more for regions with industrial traditions (e.g., Basque country or Catalonia), as well as for those where tourism-related services are not at the core of their economic activity (e.g., Asturias, Castile-Leon or Madrid). Instead, regions which rely chiefly on seasonal work derived from personal services or a diminished union tradition (such as the Balearic Islands, Canary Islands or Valencian Community) show more intense rates of leaving at any given time. Regarding the size of membership at the firm level, we find that those working in firms with more than 500 union members have the lowest propensities of withdrawal. Other sizes of membership have similar hazard ratios of leaving the union though. Last, non-employment situations, and those with no information on membership size, are associated with the highest risks of leaving the union at any duration interval.

To confirm the validity or the bias of our results due to left-truncation, we run a parallel analysis with observations that are strictly not left-truncated. We do so in the model presented in the third column of Table 1 (i.e., *joining since Jan. 2009*), where members joined since January 2009 and were leaving between January and October 2009. The results of this model greatly resemble those of the model with left-

truncation, with some exceptions. First, women are no more likely to leave at any time than men. Previous research has found that women have been consolidating their membership over time, and that the economic crisis has affected more the membership of men, more often working in the construction sector (Jódar et al. 2012). The other socio-demographic characteristics (age and citizenship) reduce the differences with the reference categories, though the sign and the statistical significance of the coefficients remain stable. Slight changes are also observed for other coefficients, but do not affect the interpretations presented so far. All in all, the problem of left-truncation in our initial analysis does not significantly bias our results.

Finally, we present predictions of the hazard rates and the survival curves adjusting for characteristics of the four groups which Alós et al. (2009) worked out, mirroring traits of segmentation of the Spanish labor market also in the union membership. The dataset, unfortunately, does not allow us to construct the groups as in Alós et al. (2009). However, we present proxies with the available data. The two peripheral groups are identified, first by women, above age 30, working in the retail sector, as the *peripheral* group; and by those aged below 30, as the *peripherals-in-transition*. Regarding the central groups, one captures men between the ages 45-59, working in industry, as the *traditional core*, and another accounts for workers aged 30-44 working in financial services or the public sector, as the *emerging-core*.

The predicted hazard rates (left) and survival curves (right) presented in Figure 5 are baseline hazard rates and survival probabilities adjusted for the membership categories commented above and using the results of the above Cox estimations.[21]

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[21] Differently to the crude survival curves calculated by the KM method, the predicted (or adjusted) survival curves for each group keep constant at the mean value other coefficients in the model, so the results are interpreted as survival probabilities net of other confounding variables in the model.

Predictions by groups produce results which confirm previous research.[22] The predicted hazard rates show, in general, increasing risks of leaving the union from joining until the tenth month of membership duration, which is the highest peak of leaving hazard. Following this, leaving hazards reduce over time, indicating that the longer the membership duration the more committed the membership. Differences, however, are noticeable across groups. We find that the peripheral groups are those with higher hazard of leaving at any time, especially at shorter membership durations. The consequence is that peripheral groups leave more by the end of the observation period and present shorter average duration memberships compared with the central groups. In particular, the group of youth (*peripherals-in-transition*) presents the highest hazards of leaving, with 10% having left in the first 12 months and approximately 25% having exited the union after 5 years. The traditional core group has the lowest rate of disaffection (5% at the end of the observation window) and the highest predicted survival probabilities for all prior duration intervals. The other two groups lay in between, with middle-aged women in retail (*peripherals*) more likely to leave and with lower membership durations than the *emerging core*.

7. Discussion and Conclusions

In this article we have proposed a further step on understanding membership dynamics by analyzing membership durations in the largest general union federation in Spain – *Comisiones Obreras* (CCOO). The results of the survival analysis show high and increasing union leaving intensities at short membership durations, leveling off after the first year of membership. Moreover, there is a dualization (or

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[22] We estimated a model regarding interaction terms of the variables presented in Table 1 in order to assess statistically significant differences across membership profiles. The interaction terms, not presented here for space reasons, are statistically significant and confirm the differences on duration of membership and leaving rates across membership groups.

pluralization) of membership trajectories as different characteristics in the analysis are not uniformly distributed across membership durations. Confirming our expectations, workers' personal characteristics associated with insecure jobs and those working in non-unionized contexts are more likely to stay for a shorter time in the union and are more likely to leave at any given time. This is particularly the case of youth, foreigners, and workers in volatile sectors such as retail, construction, and those in small firms. In contrast, workers in sectors with a tradition of unionism, like industrial sectors, or, where the influence of the union emerged more recently (mainly the public service sectors), and those in regional units where the union is particularly strong have memberships which appear to be longer and the probability of leaving much lower. The pluralization of memberships is additionally confirmed by testing the typology of CCOO union members by Alós et al. (2009), where the extreme vulnerability of the membership of the youth (*peripherals-in-transition*) contrasts with the more stable memberships of traditional industrial workers (*traditional core*).

The facts presented so far suggest that high membership turn-around in CCOO is partly derived from *express-memberships* of short durations. These are mainly featured by the growing segment of peripheral workers in the membership, though they are still a minority. This may illustrate the case of workers who join for the express intention of solving an immediate problem. However, due to the vulnerability of the work situation and the invisibility of the union in the work environment, these workers might disaffect themselves from union membership. This can happen in a very short time if the employment situation does not improve or the union is not perceived to be close and active. To provide an illustration, workers under age 30 have the highest rates of unemployment and fixed-term contracts in Spain. This age group represents around 8% of the membership of CCOO in 2010, but they were

around 70% of all new CCOO members in 2010 but 60% of leaves during the same period. Under such scenario, we propose that retention policies should work on early stages of union membership.

We do not want to claim that there is only one mechanism (and results do not allow raising any causal claim) that leads to leaving or the timing of such an event for a prototypical peripheral worker. For instance, *women* are a very heterogeneous group. Some female members have relatively higher education and work in public or financial services. These women are more likely to have lower costs of remaining in the union than other women, generally much younger or older, who work in less qualified services and have no promotion opportunities. While youth, striving for labor market insertion, are likely to change to a job that improves their employment conditions substantively instead of engaging in collective action (Antón 2007, Germe 2011). Immigrants as a group are more likely to lose employment by working in more volatile sectors, (e.g., construction). However, immigrants are also more likely to enter the union if they were unionized in their country of origin and if they find a critical mass of co-ethnics (Jódar et al. 2011c). In general, socialization becomes an important motivation to remain in the union. Contacts in the union (i.e., relatives, acquaintances, or work colleagues) might be a worthwhile topic of investigation as a determinant of membership continuity by members in peripheral positions. This may also explain differences between peripheral workers who enter the union and those who do not. In addition, lack of union representatives, mainly in smaller work centers where peripheral worker members are employed, leads to low levels of activism (Jódar et al. 2011) and, finally, may trigger early union exit (Jódar et al. 2011b). The implantation of transversal union delegates to deal with matters of work centers

without union representatives, but with union members, could be a way to make the union visible and more accessible to their members.

We can also look at the other side of the coin. Although the new membership groups present high turn-over rates, a great deal of this membership remains over a year, and maybe over the length of their work contract[23]. In an inclusive model of industrial relations like Spain, where workers do not need to join the union to enjoy bargaining outcomes, the employment situation is still an important, but not the only, catalyst of membership dynamics. We should draw attention to the efforts of the union on recruitment practices of new membership groups. The turn towards a social partnership model and the increase of servicing organizations has been responsible for the increase and consolidation of new membership groups, emphasizing the plurality of membership composition. This, however, is difficult to fit into a common union strategy. Secretariats and localized structures for youth, foreigners or women have been active in dealing with specific problems of these workers in order to ensure their recruitment and retention. However, the effects of these efforts may be limited. The capacity of recruitment and retention by Spanish unions has been told to be limited in comparison to unions in other industrialized nations by a lack of clearly articulated bargaining structure, featuring a rather weak shop-floor, and the endemic under-organized civil society that undermines the establishment of long-term strategic coalitions (Hamman and Martinez Lucio 2003). These tensions are also evidenced by some results of re-joining levels for CCOO in Catalonia, where only 10% of leavers between 2001 and 2010 were likely to re-join, indicating that those who leave the union are unlikely to return. Although unrepresentative, these results point to the need for further examination of who re-joins and when.

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[23] Unpublished analysis of a survey of CCOO union leavers indicate that 34% of union leavers had disrupted their employment situation and/or changed job/occupation during their membership.

In this article we have gone beyond the leave-stay dichotomy, and shown differences on durations of membership. Longer durations support organizational stability and consolidate union representation strategies, while short durations assimilate to uncertainties. The findings of this type of analysis shed some light on understanding membership dynamics and may be useful to declare priorities of retention at specific moments of high incidence of attrition. Survival models are appealing methods for the analysis of membership duration as they account for endemic biases in the analyses of duration data with traditional methods (e.g., censored cases and non-normality of duration function). They also allow the assessment of independent variables that may change over time (e.g., job situation).

We are aware that our analyses suffer some flaws and interpretation might be delimited. Although our results are more reliable than those of traditional regression methods, analyses should be replicated for a longer period of observation. One should also be aware that we analyzed a period of economic crisis. This may particularly emphasize shorter duration for those more prone to leaving the union, those whom the economic crisis has affected the most (e.g. youth, foreigners). In the analysis, women presented longer membership durations than men because the effects of the economic crisis on lowering their joining and leaving rates have been delayed. Future analyses should also include a richer set of personal related characteristics, such as values, perceptions, educational attainment, as well as (changing) job- or work context-specific characteristics relevant to test different theoretical arguments about membership trajectories and/or their pluralization. In addition, if an individual is likely to join and leave the union several times, then the whole working biography of an individual might form the object of analysis. For that we must extend the

traditional setting of single memberships to multilevel methods that allow modeling repeated memberships of the same individual.

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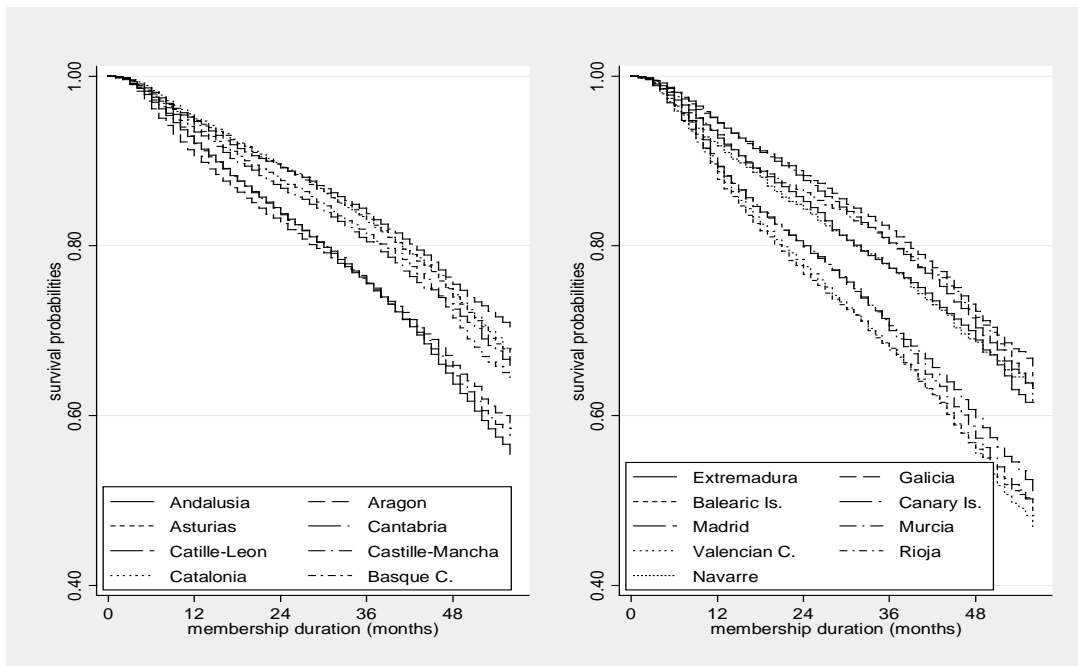Figure 1. Survival curves by socio-demographic factors
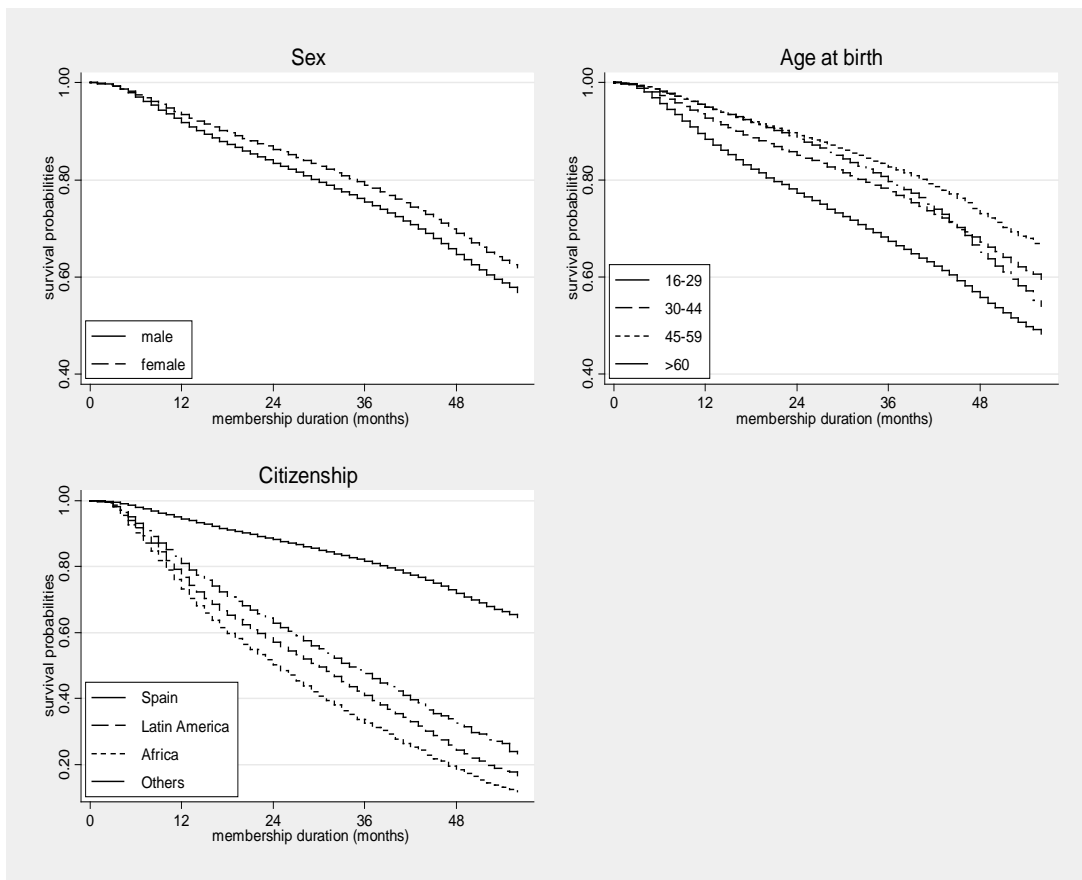
Wilcoxon Tests: sex (Pr>chi2 = 0.00), age at birth (Pr>chi2 = 0.00), citizenship (Pr>chi2 = 0.00).

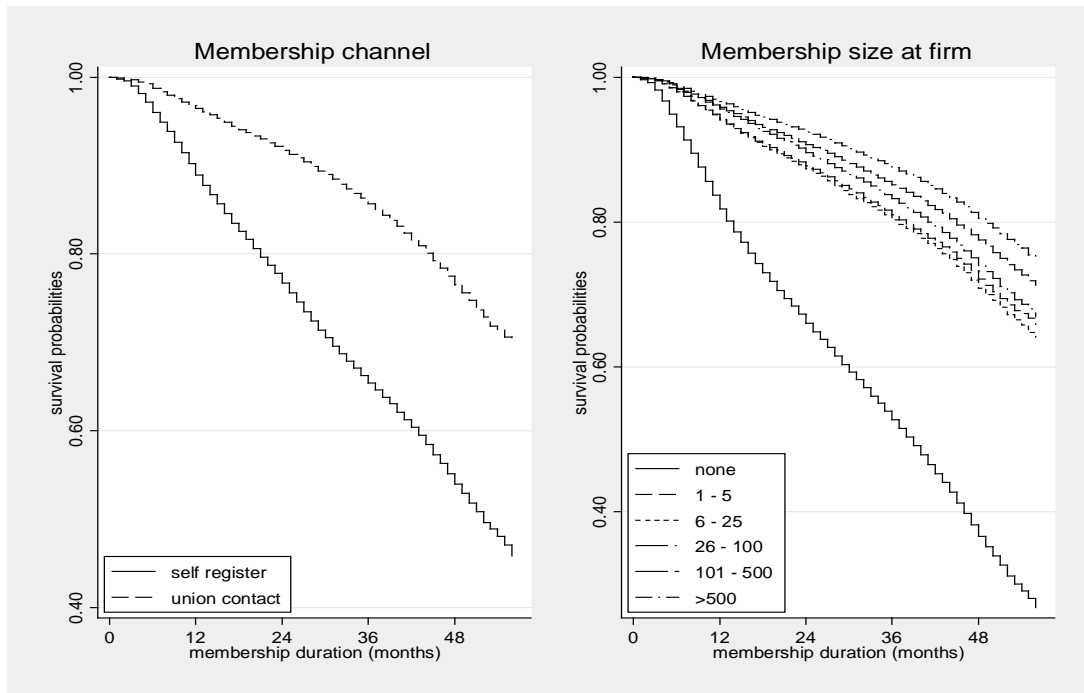Figure 2. Survival curves by activity branch
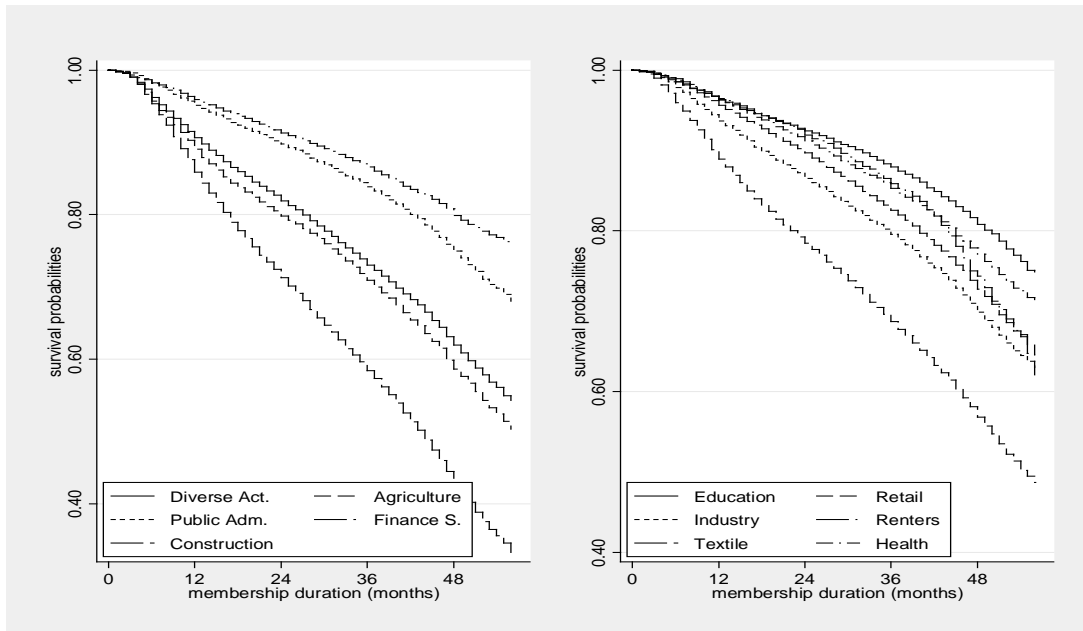
Wilcoxon Tests: Pr>chi2 = 0.00.

Figure 3. Survival curves by regional unit.

Wilcoxon Tests: Pr>chi2 = 0.00.

Figure 4. Survival curves by membership channel and by membership size at firm.

Wilcoxon Tests: membership channel (Pr>chi2 = 0.00), membership size at firm (Pr>chi2 = 0.00).

Table 1. Cox regression of duration of membership (hazard rates).

	Joining since Jan. 2005		Joining since Jan. 2009	
	Hazard ratio	Std.err.	Hazard ratio	Std.err.
(a) Sex: female (ref. male)	1.05***	(0.01)	0.97	(0.02)
(b) Citizenship (ref. Spanish)				
North-African	2.43***	(0.03)	2.09***	(0.07)
Latin-American	2.58***	(0.04)	2.19***	(0.08)
Others	2.27***	(0.04)	1.95***	(0.09)
(c) Age (ref. 45-59)				
16-29	1.74***	(0.02)	1.44***	(0.04)
30-44	1.23***	(0.01)	1.21***	(0.03)
(d) Activity branch (ref. Public Administration)				
Services (miscellaneous)	1.39***	(0.02)	1.41***	(0.06)
Agriculture	1.17***	(0.02)	1.16***	(0.05)
Financial services	0.88***	(0.02)	0.84***	(0.04)
Construction	1.54***	(0.02)	1.28***	(0.05)
Education	0.64***	(0.01)	0.67***	(0.04)
Retail	1.40***	(0.02)	1.50***	(0.06)
Industry	1.16***	(0.02)	1.00	(0.04)
Textile	1.01	(0.02)	0.92	(0.06)
Health	0.80***	(0.01)	0.63***	(0.04)
(e) Regional unit (ref. Andalusia)				
Aragon	0.83***	(0.02)	0.77***	(0.04)
Asturias	0.69***	(0.02)	0.66***	(0.05)
Cantabria	0.80***	(0.02)	0.67***	(0.06)
Castille-Leon	0.66***	(0.01)	0.66***	(0.04)
Castille-La Mancha	0.86***	(0.01)	0.69***	(0.03)
Catalonia	0.73***	(0.01)	0.56***	(0.03)
Basque Country	0.76***	(0.02)	0.72***	(0.04)
Extremadura	0.84***	(0.02)	0.77***	(0.06)
Galicia	0.82***	(0.02)	0.67***	(0.04)
Balearic Islands	1.32***	(0.03)	0.92	(0.07)
Canary Islands	1.27***	(0.02)	1.09*	(0.05)
Madrid	0.79***	(0.01)	0.69***	(0.03)
Murcia	0.95***	(0.02)	1.03	(0.05)
Valencian Community	1.05***	(0.01)	0.86***	(0.03)
La Rioja	0.76***	(0.03)	0.71***	(0.09)
Navarre	0.65***	(0.02)	0.74***	(0.06)
(f) Membership size at firm (ref. >500)				
Non-employed / no info.	3.27***	(0.04)	3.83***	(0.15)
1-5 members	1.20***	(0.02)	1.13***	(0.05)
6-25 members	1.39***	(0.02)	1.28***	(0.06)
26-100 members	1.20***	(0.02)	1.09	(0.06)
101-500 members	1.12***	(0.02)	1.15***	(0.06)
N	488,881		97,607	
Log-likelihood (empty model)	-1,091,449.9		-107,810.3	
Log-likelihood (final model)	-1,058,791.6		-103,717.8	

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Leaves are observed between Jan. and Oct. 2009.

Figure 5. Cox regression predicted hazard rates (left) and survival curves (right).
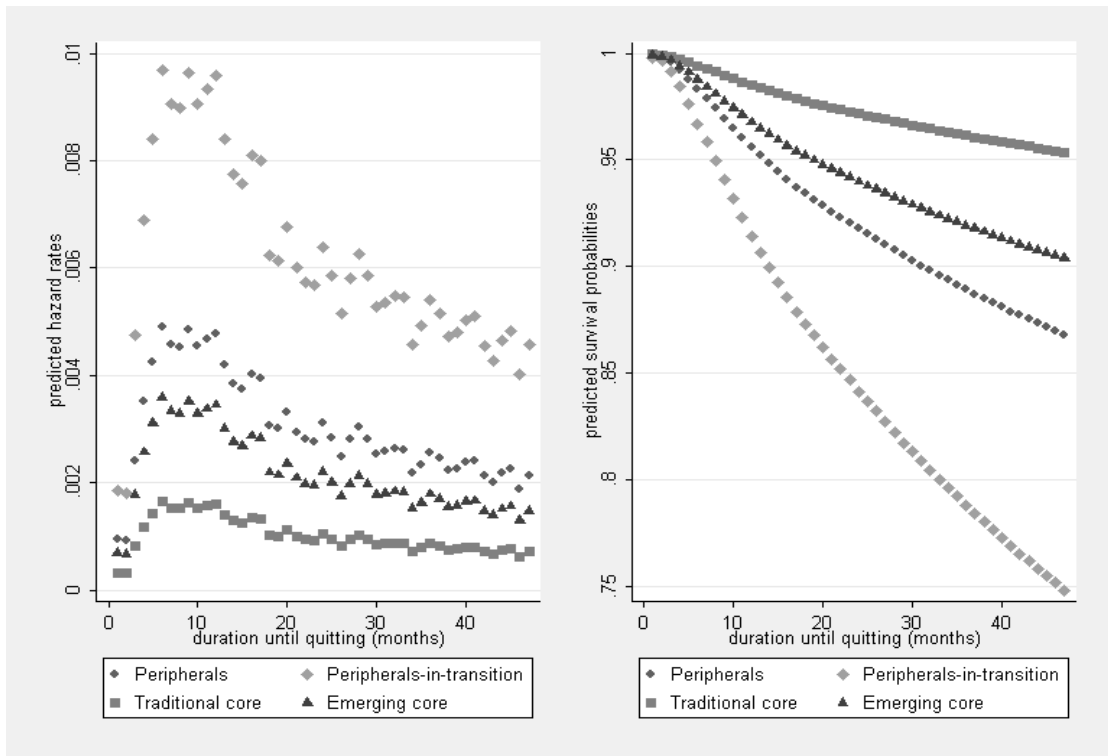
Predictions based on regression model -*Joining since Jan. 2005*- of Table 1.