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Time To Go? Head Coach Quits and Dismissals in Professional Football

Alex Bryson[1], Babatunde Buraimo[2] and Rob Simmons[3]

Abstract

That football Head Coaches will be dismissed for poor performance and will quit when they have better outside options seems to be nothing more than a statement of the obvious. But owners may find it hard to distinguish poor performance from bad luck and may find it difficult to identify and attract talented managers from other clubs. Indeed, most of the literature indicates little improvement in team performance when one coach replaces another. Equally, Head Coaches may have few options to move to better clubs even when they are performing well. We identify significant differences between determinants of quits and dismissals that are largely consistent with a standard model which predicts departures occur when the value of the job match specific surplus for one or both parties falls below the value of outside options. However, dismissals and quits are more common in Italy and Spain than in Germany and France, suggesting institutions may be important. We discuss the implications of our findings in the context of principal-agent theory and the wider literature on turnover among CEOs and other corporate leaders.

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Introduction

In a principal-agent framework managers are brought in by owners to run their firms with a view to maximising profits. If the firm is a listed company, owners will observe performance annually and, in the light of company performance and ambient labour market conditions, choose how to reward or punish senior management. In the absence of real time performance data and given the costliness of monitoring the activities of senior executives (Bandiera et al., 2012), owners may use proxy measures of corporate performance, such as share price movements, to up-date their information regarding how well senior management are performing. Share price movements and annual profitability may reflect many factors, including changes in market sentiment and changes in business conditions, some beyond the control of the senior executives. Furthermore, even though Chief Executive Officers (CEOs) have an important role in determining the productivity of all other employees due to their position at the apex of the organization (Rosen, 1990), it is extremely difficult to identify the causal impact of leaders on organizational performance.[4] Nevertheless, CEOs are formally responsible for the corporation's performance and may therefore expect that performance to be reflected in their compensation packages and the longevity of any employment contract they may be offered.

When a firm is performing poorly, or more poorly than expected, the CEO can expect to be under pressure to "turn things around" and, if this does not happen, they may be under threat of dismissal (layoff). Poor performance of the firm may be directly related to the decisions or indecision of top executives, or may simply be "bad luck", as in the case of deteriorating market conditions. For this reason, owners often use the firm's performance relative to its competitors to determine executive compensation, thus conditioning on the market conditions all firms in the industry face (Bertrand and Mullainathan, 2001). Conversely, if a firm is performing very well, other firms may treat this as a signal of the CEO's high ability and seek to poach the CEO. At the very least the CEO may seek to use good performance in on-the-job search to secure a job offer from a better firm.

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[4] Efforts at doing so rely on exogenous changes in personnel associated with death or hospitalization. Examples include Besley et al. (2011) on heads of government and Bennedsen et al. (2012) on CEOs.

In this paper, we identify the factors that determine the senior executive turnover in a single, global industry where principals receive weekly updates on firm performance. We do so by modelling senior executives' time to exit from a firm, distinguishing between layoffs made by firms and quits, which are employee decisions to leave. The industry consists of small to medium sized businesses offering a single service competing directly against one another in a transparent fashion. Market conditions are very stable over the period of a few years and there are few exogenous factors in this market that can heavily influence firm performance in the short run. So it is, perhaps, unsurprising to find that firm success or failure is often attributed to the CEO.

The industry is professional football and the firms are football clubs.[5] The "CEO" role is performed by Head Coaches - often referred to as "managers" in the UK - who are appointed to run team affairs. Although the scope of the role varies across countries and even within country depending on club owners' preferences, most Head Coaches have the power to recruit football players to the squad, and Head Coaches pick the team for games from that squad.[6] Head Coaches are also responsible for recruiting back room support staff and for the coaching tactics used to beat opponents. It seems reasonable to assume, therefore, that Head Coaches play a crucial role in determining team performance, even though this causal impact has proven rather difficult to identify in practice.[7]

Club owners are able to update their information on Head Coach performance with the results from each game, which tend to happen on average once a week during the football season. This provides them with an opportunity to consider Head Coach performance relative to expectations on an almost continual basis, something that is

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[5] In the United States these would be termed "soccer" teams because the term "football" is reserved for American Football.
[6] In Continental Europe hiring and release of players is handled by the Director of Football with input from the Head Coach.

[7] Van Ours and Van Tuijl (2016) are the most recent contributors to this literature. They find improvements in team performance after coach dismissal are accounted for by regression to the mean, a finding which is consistent with much of the literature they review.

harder to do in circumstances where principals only receive annual financial accounts and find monitoring executive performance costly.

Whereas football players can only be traded at particular times during the football season, coaches can be laid off or hired throughout the season, as well as in the closed season. Head Coaches are also able to signal how good they are to prospective employers on a weekly basis through their team's performance, which is often attributed to the Head Coach. Prospective employers are therefore able to update their assessments of Head Coach quality weekly, and may well seek to poach rival teams' Head Coaches, creating strong incentives for Head Coaches who are performing well to quit their existing employer in favour of another, subject to negotiation over early departure clauses in their contracts of employment.

Using a particularly large and rich data set on Head Coaches from the first two tiers of four European leagues over the period 2002 to 2015, we estimate duration models for quits and dismissals. We identify significant differences between determinants of quits and dismissals which are largely consistent with a standard model which predicts that departures occur when the value of the job match specific surplus for one or both parties falls below the value of outside options. However, dismissal and quit probabilities are more common in Italy and Spain than in Germany and France, suggesting institutions may be important.

2.   Theory and Empirical Evidence

In the standard model, workers are hired when the match-specific surplus generated for the firm exceeds the costs of hire. Termination of the contract will occur through dismissal by the employer (often termed "layoff"), or a quit by the worker, where the value of that match for one or both parties falls below the value of an outside option (Farber, 1999). Worker actions such as gross negligence, incompetence or misconduct substantially reduce the net value of the contract to the employer thus resulting in dismissal. Over the life-cycle, a gradual deterioration in worker performance, for example through the degradation of skills or age-related health

issues, will reduce the match-specific surplus, especially if the experienced incumbent has benefited from an upward sloping wage profile.[8]

Monitoring costs are often too high to establish with any certainty changes over time in the productivity of employees. Exceptions include circumstances in which output is readily identifiable as individual effort, as in the case of academics' publications (eg. Levin and Stephan, 1991). In the case of CEOs, organizational performance is often attributed to them, whether this is justified or not. The costliness of monitoring their inputs means owners prefer to link their compensation to performance outcomes, thus allowing for continual adjustment in the rules governing the sharing of surplus between the principal and agent. Performance pay is akin to wage renegotiation in being able to limit inefficient worker-firm separations (Gielen and van Ours, 2006). Even then the firm must appraise the value of the worker-firm match relative to the value of hiring a new worker.

Firms face the problem that CEOs are heterogeneous in ability and it is hard to identify which are the more talented among them. There is ample evidence that CEOs are heterogeneous in quality and that this affects firm policies (Bertrand and Schoar, 2003). Furthermore, leaders affect team productivity (Lazear et al., 2015). Muehlheusser et al. (2016) present evidence of substantial heterogeneity in Head Coach ability in the German "Bundesliga", where team performance varies according to the ability of the incoming coach. Theory suggests inefficient hiring in talent markets whereby mediocre workers are re-hired in the face of risk associated with appraising the talent of workers that are new to an industry (Tervio, 2009). This market failure arises where talent is industry-specific, is only revealed on the job and, once revealed, becomes public information. More productive firms hire those revealed to be high-ability whereas less productive firms must experiment with untested new workers. Where there is insufficient discovery of new talent firms are forced to re-hire some workers known to be mediocre. Peeters et al. (2016) confirm

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[8] Contracts may also cease when workers retire. Under Lazear's (1979) compulsory retirement model firms pay young workers below their marginal product during training, setting the wage profile such that investments in firm-specific human capital are rewarded in the long-run. Workers are incentivised by retirement packages which are triggered around the time the worker's marginal product is exceeded by his marginal labour costs.

that this market failure exists among Head Coaches in professional football in England.

We contribute to the literature in three ways. First, our large sample and sizeable number of quits as well as dismissals gives us the power to detect influences on these outcomes that may not have been possible in previous studies. Second, our data contain a richer set of Head Coach characteristics than is commonly available so that we can distinguish various aspects of general and firm-specific human capital, as well as coaches' achievements as football players earlier in their careers. This richer set of covariates offers greater insight into the factors affecting coach exits than has been possible until now. Third, to our knowledge all studies to date focus on single countries. We investigate cross-country differences with data from four countries (Germany, Italy, Spain and France).

The theory and evidence presented above in relation to CEO hires and CEO heterogeneity has implications for Head Coach quits and dismissals in professional football. We use these insights to test five hypotheses with our data.

Hypothesis One: Good performance and performance above expectations reduces the likelihood of dismissal and increases the likelihood of quitting.

Team owners are able to update their information on Head Coach talent on a weekly basis, comparing the performance of their Head Coach to others. It seems likely that team performance should have strong predictive power in establishing whether a Head Coach will be dismissed. This proves to be the case in the nine studies on within-season coach dismissals reviewed by Van Ours and Van Tuijl (2016: 593) covering leagues in England, Germany and Spain. Van Ours and Van Tuijl (2016) also confirm this for the Dutch league but extend previous analyses in various ways. First, they introduce expectations using betting odds and find that these play an important role in determining probability of Head Coach dismissals. Second, they

supplement within-season estimates with coach spell estimates where coach spells span seasons, so that they can incorporate dismissals in the closed season. Results are similar. Third, they are able to identify quits. However, they find no significant effects of expected team performance on quits, perhaps because these are rare events in their data.

In keeping with this literature we suspect good performance, and performance above expectations, will lower dismissal rates by increasing the net value of the contract to the employer. However, they may also increase the likelihood of a quit due to "poaching" behaviour on the part of competing firms which increases the job offer rate for Head Coaches. Conversely, a sequence of bad results may be perceived as an indicator of poor Head Coach performance, rather than simply a bad run of luck (what Rabin and Vayanos (2010) refer to as a "hot-hand fallacy"), thus raising the likelihood of dismissal and reducing the opportunity to quit for another job.

Hypothesis Two: General human capital will be valued by employers, protecting Head Coaches from dismissal having conditioned on performance. General human capital should be prized by other employers so it should also generate more outside offers, and thus increase quit rates. However, conditional on experience, age will increase dismissal probabilities due to employer expectations regarding the future job-match surplus.

The literature finds that the personal attributes of Head Coaches are relatively unimportant in explaining dismissals and quits. Van Ours and Van Tuijl (2016) say this is why they remove them from their preferred model specification (p. 598 and footnote 8). The exception is coach experience which appears to be positively related with dismissal probabilities in their study echoing the finding from other studies reviewed by Van Ours and Van Tuijl (2016) that age is positively associated with dismissal.

Conditional on experience and performance, we anticipate that older Head Coaches are more likely to be dismissed due to employer expectations of a reduction in future

match-specific surplus arising from risks such as health issues, and the relative costliness of Head Coaches late in their career. We anticipate that general human capital such as coach experience will be valued by employers, potentially protecting the Head Coach from dismissal, even when performance is below expectations (although this is not what Van Ours and Van Tuijl (2016) find in their study). Similarly, signs of success in the coach's previous jobs (such as winning cups or titles, or getting clubs promoted) will delay the point at which the employer dismisses a coach conditional on performance.

It is less clear that experience and past performance will affect quit probabilities since job offer rates are likely to be driven by performance in the current job although, given the likely market value of past coaching experience and past coach performance in tackling management problems in a new environment, one would expect general human capital to raise job offer arrival rates, potentially increasing quits. However, older Head Coaches are less likely to attract outside offers since prospective employers will anticipate a lower job match surplus from older employees, all else equal.

Hypothesis Three: Increased firm specific human capital will lower dismissal probabilities but will have no significant effect on quit probabilities

Increases in firm specific human capital should lower dismissal probabilities by providing workers with insights about the specifics of the firm and its production processes which can then raise labour productivity (Becker, 1962). Of course, human capital investments such as on-the-job training are potentially endogenous with respect to turnover probabilities since employers will not make these investments without appraising the likelihood of a return (Becker, 1962: 19-20). To overcome this problem we focus on measures of firm-specific human capital pre-dating the current spell, namely number of previous spells at the club, whether the Head Coach was hired from within, and whether the Head Coach was an ex-player at the club.

The effects of these types of firm specific human capital on quit probabilities are less clear-cut, a priori. On the one hand, even if alternative employers partly discount the value of investments made in another firm, they may nevertheless view these mutual employer-worker investments as a signal of the worker's worth in the labour market, in a similar way to internal promotions (De Varo and Waldman, 2012), potentially raising the probability that a Head Coach will receive an outside offer. On the other hand, a Head Coach's firm-specific human capital investments are likely to lower quit rates to the extent that they increase the value of the current job match relative to outside options, thus raising the probability that the Head Coach will reject any outside offers (Stevens, 2003).

Hypothesis Four: Conditional on performance the Head Coach's experience as a professional footballer will not significantly affect dismissal or quit probabilities

Goodall et al. (2011) argue that brilliance as a basketball player is a good predictor of subsequent performance as a team coach. Past playing experience facilitates a teaching role for Head Coaches. Moreover, a Coach's motivational effort may well be more credible in the eyes of current players if the coach has had success playing the sport. This may explain why leaders with expert knowledge of an organization's core business improve its performance (Goodall and Pogrebna, 2015). However, having conditioned on team performance under the Coach, it seems unlikely that the Head Coach's experience as a footballer will influence quit and dismissal probabilities, unless it increases the playing squad's respect for the incumbent manager, regardless of performance, thus "keeping the dressing room" for longer than might otherwise be the case.

Hypothesis Five: Dismissal probabilities will be greater in Italy and Spain than they are in Germany and France

Cross-country differences may emerge for a number of reasons. First, labour markets operate quite differently due to differences in employment protection, for example (European Commission, 2013). Second, football institutions differ across

countries in terms of governance structures, the financing of clubs, media attention, and team ownership. Third, there are cultural differences in attributes such as patience that might mean principals' responses to agents' performance differs across countries (Dohmen et al., 2015). Although we do not observe these differences directly we can examine cross-country differences with country dummy variables. Our expectation is that turnover rates are likely greater in Italy and Spain than in Germany and France, in part because pressure on owners to act in the face of poor performance from the media and fans is arguably greater in the former two countries. Governance structures in Germany, and to some extent France, where clubs tend to be member-owned and less open to foreign investment than those in Italy and Spain, may predispose owners to take a longer-term view (Hall and Soskice, 2001). Furthermore, German and French individuals exhibit greater patience than Spaniards and Italians in social surveys, suggesting that clubs with member-owners may be less likely to dismiss Head Coaches conditional on performance (Falk, 2016).

It is less clear whether there will be cross-national differences in quit probabilities but these may occur if Head Coaches themselves exhibit different levels of patience, or some national labour market conditions or institutions are more conducive to labour mobility than others.

3.   Data and Empirical Approach

We have data for 693 Head Coaches who were in charge of the football games played by the 220 teams in the top two tiers of professional football in Germany, France, Spain and Italy in the period 2000/1 to 2014/15. The full sample contains 75,800 coach-game observations of which 1,258 ended in dismissal while in 501 instances the coach quit the club. In the remainder the Head Coach remained in post. Of the Head Coaches in the sample, 599 were dismissed at some point and 281 quit. The data are a flow sample in that we observe the start date for all coaches' initial employment spells, including those that overlap the start of the initial football season in our data.

First, we estimate time to exit (whether a dismissal or quit), time to dismissals and time to quits separately using Cox proportional hazard rate models estimated with maximum likelihood. The 693 Head Coaches in our data experience a total of 1,758 exits. These are multiple-failure per subject data: the minimum number of exits for coaches is zero, the maximum is 11, the median is 2 and the mean is 2.5. Time is measured in days. The median survival time is 350 days; survival time at the 25th percentile is 163 days and is 874 days at the 75th percentile. Head Coaches experience 1,257 dismissals (minimum zero, maximum 11, median 1, mean 1.81) with a median survival time of 514 days (185 at the 25th percentile and 1,300 at the 75th percentile). There are 501 quits (minimum zero, maximum 7, median zero and mean 0.72) with a median survival time of 1,600 days (711 at the 25th percentile and 3,435 at the 75th percentile).

Having dropped cases with missing observations our exits, estimates are run on 638 Head Coaches. The models are run with a robust estimator to account for heteroscedasticity and standard errors are clustered to account for the non-independence of Head Coach spells.

We run an identical model specification across all three dependent variables. The explanatory variables include six team-level variables, three of them time-varying within spell and three that are time invariant. The time-varying controls are the points-per-game obtained during the current football season, the number of games remaining in the season and a dummy variable identifying the closed season. The closed season indicator is required because we estimate the duration of management spells that can last multiple-seasons. Around two-fifths (42%) of departures in our data occur in the closed season. Closed-season departures account for nearly one-third (30.1%) of dismissals and three-quarters (74.1%) of quits.

Three of the time-invariant variables capture the team's performance in the previous season, namely whether the team was promoted, whether they were relegated, and their rank position in the two-tiers of their domestic league in the previous season.

Following Stadtmann (2006) and Van Ours and Van Tuijl (2016) we incorporate a measure of 'surprise' regarding team performance based on odds set by bookmakers which captures the difference between the actual number of points and the expected number of points based on the odds of the bookmakers during the season to date. A positive value on this surprise variable indicates that performance has exceeded expectations. Specifically, using the betting odds and accounting for the bookmaker's over-round, we compute each team's probabilities for a win (pw), a draw (pd) and a loss (pl). The expected number of points is (pw×3)+pd and therefore expectation (or surprise) is the expected number of points subtracted from the actual points from the match.

Models incorporate three sets of variables relating to the Head Coach. The first set contains nine measures of his general human capital, namely his age, his experience as captured by the date at which he began his Head Coach career[9], the number of previous spells he has had as a Head Coach, a dummy identifying whether he has ever had any international experience as a coach, a dummy variable identifying whether he is currently working in his native country, whether he has coached a team that was promoted to a higher division in the past, whether he has coached a team that was relegated to a lower division in the past, whether he has coached a team that has won a cup before, and whether he has coached a team that has won the league title. The second set contains three measures of firm-specific human capital, namely whether the Head Coach ever played professional football for the club he is now coaching, whether he has previously coached the club he is currently coaching, and whether he was an internal appointment from within the club.

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[9] So that a smaller value on this variable indicates greater coaching experience.

The third set of variables containing coach characteristics captures his ability as a professional football player, in the spirit of Goodall et al. (2011) who, as noted earlier, emphasise the value of past experience playing a sport for success as a coach in that sport. These variables are whether the coach ever played football for his national side, number of years' experience as a professional football player, a dummy variable identifying whether the coach had ever played in the top division as a professional footballer and a dummy identifying Head Coaches who had never played football professionally.

Models also capture real time as indicated by the football season, dummy variables capturing the country league, and a dummy identifying whether the games are taking place in the top or second tier of football in that country.

We also run a discrete time competing risks model since a non-censored spell can end with one of two occurrences, namely a dismissal or a quit. Time is measured in game days. The estimator handles multiple failures per subject. We present a model which contains the same covariates to those in the Cox proportional hazards model except we replace season dummies with continuous time variables, namely a count for number of games in the spell plus the log of this variable.[10] Estimation is based on 638 Head Coach observations and 68,208 coach-game observations.

Finally we estimate mixed effects parametric survival models which account for unobserved heterogeneity across Head Coaches.[11] We run separate models for leaving, dismissals and quits. The conditional distribution of the outcomes given the random effects is set to a Weibull distribution. Descriptive data for the variables used in the analysis are presented in Appendix Table 1.

4.   Results

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[10] This imposes a Weibull distribution on the data which seemed reasonable having experimented with alternatives since log(time) is on the margins of statistical significance in estimating time to dismissal.
[11] We use the STATA routine MESTREG.

Table 1 presents separate Cox proportional hazards models for all Head Coach departures, dismissals and quits (columns 1, 2 and 3 respectively). The tables present coefficients, not the hazard ratios.

[INSERT TABLE 1]

In keeping with *Hypothesis One* improved performance and greater performance above expectations reduce the likelihood of Head Coach dismissal. However, contrary to *Hypothesis One*, neither performance variable was significantly associated with the likelihood of quitting. One possible reason for this, discussed earlier, is that good performance triggers performance-related pay in Head Coaches' contracts reducing the value of accepting outside offers. Alternatively, Head Coach contracts may be "stickier" than one might think, with teams waiting until the end of the season before they make changes, perhaps because this is when many contracts cease in any event and employers are keen to limit financial and other liabilities which might result in "poaching" another team's manager, even if this appears optimal. Support for this alternative "stickiness" hypothesis is indicated by the positive and statistically significant coefficient on the dummy variable identifying the last day of the season in both the quits and dismissals models, suggesting that both teams and Head Coaches often simply wait until the season ends before making changes.[12] Running counter to this is the negative and statistically significant coefficient on the games left to the end of the season, which suggests the likelihood of both quits and dismissals rises as the season end approaches, probably because teams seek to make changes at the "business end" of the season when the consequences of failure or success become increasingly apparent.[13]

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[12] Contracts often expire at a season's end, so some of these departures will reflect the non-renewal of fixed term contracts.
[13] Owners may be less concerned by early poor performance if they think there is sufficient time left in the season for a coach to "turn things round". Lower quit rates earlier on may also reflect the relative paucity of available job slots, thus limiting the job offer arrival rate.

The models offer strong support for the proposition in *Hypothesis Two* that general human capital is valued by employers and protects them from dismissal even conditioning on performance and performance expectations. The nine general human capital covariates are jointly statistically significant in the dismissals model (chi-sq(9)=47.05, p>chi2=0.0000). Indicators of previous success (coaching a team that was promoted to a higher division or won a cup) and Coach experience reduce the likelihood of dismissal. So too does working in one's home country, perhaps because "local" knowledge of club competition provides Coaches with insights into how to manage teams, or else because it improves communication between the Coach and players, most of whom are usually drawn from the home country.[14] On the other hand, as anticipated in *Hypothesis Two*, Head Coach age is positively correlated with coach dismissal, suggesting employers expect future job-match surplus to fall as workers get older.

The general human capital variables are also jointly statistically significant in the quit models (chi-sq(9)=20.82, p>chi2=0.0135). As anticipated, greater coaching experience is associated with a greater likelihood of quitting, as might be the case due to "poaching". However, having more previous spells as a Head Coach *reduces* the likelihood of quitting, as one might expect in a "job shopping" model in which workers search until they achieve a good job match. Previous experience coaching a team that was subsequently relegated is also associated with lower quit probabilities, consistent with *Hypothesis Two's* assumption that prospective employers will be less likely to make job offers to coaches who have previously been associated with failure.

In *Hypothesis Three*, we proposed that greater firm specific human capital should lower dismissal probabilities but would have no significant effect on quit probabilities. This proves to be the case. The three firm-specific human capital variables are jointly statistically significant for dismissal (chi-squared(3)=10.18, p>chi2 0.0171),

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[14] Coaches often create a bond with the team's supporters who can express their support for the Coach vocally at games. The degree of support for a Coach may vary between native-born and foreign Coaches, and may sway principals when deciding whether to dismiss a Coach. The bond may also increase the value of remaining at the club, lowering quit rates.

although the only measure that is statistically significant on its own is the number of previous spells coaching the club, which is strongly associated with a lower likelihood of being dismissed. The three variables were not significant in the quits equation either jointly (chi-squared(3)=2.10, p>chi2 0.5528) or individually.

In *Hypothesis Four* we suggested that, conditional on performance, the Head Coach's experience as a professional footballer would not significantly affect dismissal or quit probabilities. The four measures capturing Head Coaches' experience as professional football players were not significant in the quit models and they were jointly non-significant (chi-squared(4)=1.60, p>chi2=0.8096), but they were jointly significant in the dismissal models (chi-squared(4)=8.77, p>chi2=0.067), driven by the positive effect of never being a professional footballer on dismissal probabilities. It is possible that intimate knowledge of the game, acquired when playing as a professional, gives Head Coaches tacit skills which are valued by the principal, such as the ability to communicate with players or motivate them. Alternatively, this effect may capture the difficulties Head Coaches have in commanding respect in the dressing room if they have not played the game.

In *Hypothesis Five* we suggested there would be differences in Head Coach turnover across the four countries in our data. The survival curves for leaving, dismissals and quits for the raw data confirm that there are cross-country differences (Figures 1, 2 and 3). Figure 1 shows the survival rate is lowest in Italy, followed by Spain, Germany and finally France. When looking at dismissals only (Figure 2) the country ordering is the same but the dispersion between countries is larger. The ordering for quits is a little different, with survival rates longest for Head Coaches in Germany (Figure 3).

[INSERT FIGURES 1, 2 AND 3]

When we adjust for other factors in Table 1 the model confirms that both dismissal and quit probabilities are highest in Italy. Head Coaches in Spain also have higher dismissal probabilities than those in France, and Head Coaches in Germany are the least likely to quit. The fact that we see cross-country differences in quit as well as dismissal rates suggests that the cross-country differences are unlikely to simply reflect country differences in the pressures facing football club owners as principals, or differences in governance arrangements although, of course, these may be very important in explaining cross-country differences in dismissal rates. There is no differential in the quit or dismissal probabilities for Head Coaches in tiers 1 and 2.

[INSERT TABLE 2]

Table 2 presents similar analyses but this time models quit and dismissal probabilities simultaneously in a discrete time competing risks model. The coefficients are presented as relative risk ratios compared to the no exit baseline. Before commenting on the hypotheses outlined above it is notable that there is duration dependence in dismissals but not quits. That duration dependence follows a Weibull distribution, rising a little initially then falling over time. In the CEO literature duration dependence has been equated with CEOs' abilities to "capture" corporate governance structures, thus limiting stakeholders' ability to remove senior executives (Gregory-Smith et al., 2009). This is unlikely in our setting. Instead it may reflect unobserved heterogeneity across Head Coaches, such that only the best coaches are observed in long duration jobs, or else longevity reflects the underlying quality of the original job-match (true duration dependence). We return to this below.

[INSERT TABLE 2]

The competing risks model also clearly quantifies the size of some of the time-varying covariates relative to the baseline of no departure. For instance, it is apparent that dismissals are more sensitive to the number of games left in the

season than quits, while the relative risk of quits is higher than that for dismissals in the closed season.

Turning to our hypotheses, with just a few exceptions the discrete time competing risks model confirms the findings from the separate Cox proportional hazards quit and dismissal models. However, there are some important differences that are noteworthy. First, contrary to *Hypothesis One,* the discrete time competing risks model indicates that good performance and performing beyond expectations were strongly and significantly associated with *lower* quit probabilities, rather than higher quit probabilities.   The implication is that Head Coaches are able to use their strengthened bargaining hand to renegotiate their compensation package with their existing employer, rather than quitting for a higher wage, or else performance pay clauses are triggered in their contracts increasing the value of the existing contract relative to potential outside offers which, as noted earlier, is akin to a wage renegotiation limiting inefficient worker-firm separations.   The other noteworthy difference is that the cross-country differences in both dismissals and quits are a little more marked in the competing risks models than in the Cox proportional hazard models. This, together with the fact that both quit and dismissal probabilities are higher in tier two than they are in tier one in the competing risks models, underscore the importance of differences in departure probabilities across leagues.

[INSERT TABLE 3]

Finally in Table 3 we present mixed effects parametric survival models for leaving, dismissals and quits separately. We assume an underlying Weibull distribution to departures. These are random effects models fitting coach-specific intercepts to account for unobservable differences across Head Coaches.   Although some individual coefficients lose their statistical significance the estimates generally support the results presented in the Cox proportional hazards and competing risks models.

In relation to Hypothesis One, there is further evidence that good performance and performance beyond expectations are both significantly associated with lower dismissal probabilities. As in the competing risks model there is also statistical support to indicate that good performance is associated with a lower probability of a Head Coach quitting, but this is not true for performing beyond expectations.

Hypothesis Two also receives strong support. The variables capturing general human capital are jointly statistically significant in both the dismissal (chi2(9) 27.75 p=0.0011) and quit models (chi2(9) 17.19 p=0.0458). Individual coefficients have the anticipated signs. Dismissal probabilities rise with age, as predicted, but quits do not.

There is also broad support for *Hypothesis Three*. Firm specific human capital variables are jointly statistically significant for dismissals (chi2(3) 10.99 p=0.0168) with the one strong significant effect being the negative effect of previous spells of coaching at a club on dismissal probabilities. In contrast firm-specific human capital variables were only jointly on the borderline of significance for quits (chi2(3) 7.71 p=0.0524) and none of the variables were individually significant.

As predicted in *Hypothesis Four*, experience as a professional player was not generally significant for dismissal (chi2(4) 8.10 p=0.0881) and quit probabilities (chi2(4) 1.17 p=0.8833) having conditioned on performance. The exception was the positive effect that never having played professional football had on dismissal probabilities. Finally *Hypothesis Five* is supported again, with Head Coaches in Spain and Italy being much more likely to be dismissed or quit relative to those in France and Germany.

5.   Conclusion

Understanding the value of job-matches and the factors leading to their cessation is fundamental to the nature of labour markets. Although initial efforts distinguishing

between the determinants of quits and dismissals go all the way back to Farber's (1980) seminal paper, there has been little research on the relative risks of quits and dismissals in the intervening period. Instead, analysts have focused their attention on various routes in and out of unemployment, no doubt driven by social welfare concerns to minimise exposure to unemployment.[15] The exceptions relate to research on CEOs in public listed companies and the fortunes of sports Head Coaches. Even here it has proved difficult to make the distinction empirically because it is not usually obvious whether a worker has been dismissed or left voluntarily and most data sets are too small to identify with confidence the factors determining the small number of departures which are quits. Nevertheless, it is clear from this small body of empirical research that quits and dismissals are very distinct forms of separation. It is also well-established that poor performance substantially raises the probability of dismissal. Expectations regarding performance also play a role. For instance, performing below expectations signalled by the betting market predicts dismissal. There are also a number of contradictory findings in the literature, and uncertainty surrounding some issues such as the role played by general and firm-specific human capital.

Using a particularly large and rich data set on Head Coaches from the first two tiers of four European leagues over the period 2001 to 2015 we estimate Cox proportional hazards and discrete time competing risks models for quits and dismissals. We can contribute to the literature because ours is a particularly large and rich data set, containing many variables that do not normally appear in the literature. The many quits we have in the data mean we have the statistical power to identify effects of covariates that may not have been apparent in previous studies. We identify significant differences between determinants of quits and dismissals that are largely consistent with a standard model which predicts departures occur when the value of the job match specific surplus for one or both parties falls below the value of outside options. However, dismissals and quits are more common in Italy and Spain than in Germany and France suggesting that institutions and corporate governance may be important.

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[15] See for example Bryson and White (1996).

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Table 1: Head Coach Dismissals and Quits, 2002-2015, Cox Proportional Hazard Models

	All Exits	Dismissals	Quits
Team:			
Position end last season	-0.005	-0.002	-0.011
	(1.15)	(0.45)	(1.21)
Promoted	0.634***	0.397	0.742***
	(3.16)	(1.25)	(2.61)
Relegated	0.690***	0.992***	0.141
	(3.53)	(3.91)	(0.43)
General human capital:			
Age of manager	0.015***	0.022***	-0.004
	(3.09)	(3.92)	(0.45)
Year of first coaching job	0.008	0.018***	-0.018**
	(1.45)	(2.67)	(2.03)
N previous spells as head coach	-0.001	0.024	-0.060***
	(0.08)	(1.62)	(2.66)
Ever experienced coaching abroad	-0.094	-0.136	-0.077
	(1.46)	(1.58)	(0.58)
Promoted to a higher division with a club	-0.182***	-0.218***	-0.035
	(3.09)	(2.95)	(0.28)
Relegated to a lower division with a club	-0.154**	-0.052	-0.489***
	(2.40)	(0.68)	(3.23)
Has won a cup with a club as coach	-0.159*	-0.348***	0.226
	(1.86)	(2.89)	(1.42)
Has won a title with a club as coach	-0.089	-0.09	-0.041
	(0.80)	(0.69)	(0.22)
Currently working in home country	-0.222***	-0.268***	-0.117
	(2.83)	(2.61)	(0.69)
Firm-specific human capital:			
Ex-player with the club	-0.056	-0.055	-0.056
	(0.61)	(0.48)	(0.30)
Number of previous spells coaching the club	-0.184***	-0.291***	0.047
	(2.77)	(3.09)	(0.41)
Hired from within	-0.028	0.017	-0.235
	(0.27)	(0.14)	(1.15)
Experience as a player:			
Played for country	-0.041	-0.067	-0.013
	(0.58)	(0.79)	(0.08)
N years' experience as a professional footballer	0.015*	0.021*	-0.001
	(1.78)	(1.90)	(0.05)
Played in top league	-0.091	-0.085	-0.055
	(1.20)	(0.84)	(0.33)
Never a professional football player	0.329***	0.411***	0.12
	(2.64)	(2.58)	(0.46)
League:			
Germany	0.06	0.154	-0.129
	(0.71)	(1.46)	(0.68)

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Italy	0.517***	0.561***	0.342*
	(6.63)	(5.62)	(1.94)
Spain	0.389***	0.452***	0.274
	(4.98)	(4.52)	(1.64)
Second tier of the league	0.051	0.057	-0.038
	(0.51)	(0.50)	(0.19)
Time-varying co-variates:			
Points per game this season	-0.000***	-0.000***	-0.00
	(7.69)	(7.67)	(1.58)
Games left this season	-0.000***	-0.000***	-0.000***
	(9.46)	(8.62)	(3.71)
Last day of season before closed season	0.001***	0.001***	0.002***
	(17.50)	(14.43)	(7.71)
Points exceed expectations this season	-0.000***	-0.000***	-0.000
	(9.09)	(8.79)	(1.52)
Season fixed effects?	Yes	Yes	Yes
pseudo R-sq	0.155	0.12	0.308
N managers	638	638	638
N game-manager observations	68172	68172	68172
Log-likelihood	-6936.18	-5150.45	-1630.17
Chi-sq	7951.65	656.79	315.30

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table 2: Competing Risks Survival Model for Determinants of Head Coach Dismissals and Quits, Relative Risk Ratios

```
Multinomial logistic regression                  Number of obs   =      68208
                                                 Wald chi2(58)   =    4330.62
                                                 Prob > chi2     =     0.0000
Log pseudolikelihood = -6029.4925                Pseudo R2       =     0.2643
```

failtype	RRR	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
No_exit	(base outcome)					
Fired						
time	.9984392	.0006548	-2.38	0.017	.9971566	.9997235
ddweibull	1.092542	.0570911	1.69	0.090	.9861846	1.210369
lastseasonlongposition	.9822234	.0053668	-3.28	0.001	.9717608	.9927986
promoted	.8488289	.2092421	-0.66	0.506	.5235923	1.376091
relegated	.8954586	.254996	-0.39	0.698	.5124511	1.564727
ageofman	1.014267	.0055667	2.58	0.010	1.003415	1.025237
firstjob	1.015573	.0057438	2.73	0.006	1.004378	1.026894
prev	1.038937	.0130462	3.04	0.002	1.013679	1.064824
intexp	1.031045	.0913611	0.35	0.730	.8666674	1.2266
prom	.810379	.0613124	-2.78	0.005	.6986942	.9399164
rel	1.128505	.0917517	1.49	0.137	.9622711	1.323455
cup	.8539925	.0916807	-1.47	0.142	.6919473	1.053987
champ	1.024399	.1351623	0.18	0.855	.7909681	1.32672
owncntry	.8466133	.096783	-1.46	0.145	.676671	1.059236
explayer	.8365872	.0984649	-1.52	0.130	.6642419	1.05365
repeat	.8597158	.0862216	-1.51	0.132	.7062968	1.04646
within	1.12851	.1441069	0.95	0.344	.8786381	1.449443
intplayer	.9762676	.0989902	-0.24	0.813	.8003131	1.190907
playexp	1.01101	.0111945	0.99	0.323	.9893061	1.033191
playtop	.9758311	.0962151	-0.25	0.804	.804355	1.183863
notplayer	1.288632	.2032602	1.61	0.108	.9459454	1.755464
germany	1.35337	.1522126	2.69	0.007	1.085631	1.687138
italy	2.128673	.2223572	7.23	0.000	1.734578	2.612305
spain	1.873971	.1987981	5.92	0.000	1.522173	2.307075
_Itier_2	1.983525	.237017	5.73	0.000	1.569369	2.506976
ppg	.1813995	.0166309	-18.62	0.000	.1515644	.2171076
gamesleft	.975898	.0034834	-6.84	0.000	.9690946	.9827491
lastday	27.82501	2.720633	34.02	0.000	22.97247	33.70255
surprise	.5868402	.0211635	-14.78	0.000	.5467926	.629821
_cons	1.08e-15	1.23e-14	-3.03	0.002	2.23e-25	5.22e-06
Quit						
time	.9995332	.0012373	-0.38	0.706	.997111	1.001961
ddweibull	1.166366	.1656539	1.08	0.279	.8829625	1.540733
lastseasonlongposition	.9795705	.0104624	-1.93	0.053	.9592778	1.000292
promoted	1.122334	.2867258	0.45	0.651	.6802421	1.851744
relegated	.6161386	.2001619	-1.49	0.136	.3259513	1.164673
ageofman	1.000154	.009103	0.02	0.986	.9824708	1.018156
firstjob	.9805761	.0083361	-2.31	0.021	.964373	.9970514
prev	.9540564	.021806	-2.06	0.040	.9122606	.9977671
intexp	1.087433	.1455174	0.63	0.531	.8365595	1.41354
prom	1.03982	.1268988	0.32	0.749	.8186122	1.320803
rel	.7300972	.0974369	-2.36	0.018	.5620586	.9483743
cup	1.302566	.1907118	1.81	0.071	.9776271	1.735506
champ	.9419531	.1741395	-0.32	0.746	.6556425	1.353292
owncntry	.9664815	.1741253	-0.19	0.850	.6789497	1.375782
explayer	.7322673	.1426254	-1.60	0.110	.4998954	1.072655
repeat	1.254531	.1681288	1.69	0.091	.9647295	1.631387
within	.8262475	.1847851	-0.85	0.393	.5330209	1.280785
intplayer	1.053533	.1605609	0.34	0.732	.781489	1.420278
playexp	1.000109	.0179133	0.01	0.995	.9656084	1.035842
playtop	.9913854	.1589073	-0.05	0.957	.7241109	1.357313
notplayer	1.18798	.3033289	0.67	0.500	.7202282	1.959511
germany	1.004737	.1801642	0.03	0.979	.7070002	1.42786
italy	2.169714	.3615865	4.65	0.000	1.565122	3.007853
spain	1.730455	.2797667	3.39	0.001	1.260505	2.375614
_Itier_2	1.573201	.3812322	1.87	0.062	.9783934	2.529618
ppg	.4044432	.0749106	-4.89	0.000	.2813188	.5814554
gamesleft	.9843715	.0092348	-1.68	0.093	.9664371	1.002639
lastday	156.7981	31.18516	25.42	0.000	106.1812	231.5443

```
    surprise |   .8618333    .0398205     -3.22    0.001      .787216    .9435232
        _cons |    4.24e+14    7.28e+15      1.96    0.050     1.018042    1.76e+29
-------------------------------------------------------------------------------
```

Notes: (1) Significance Key: * p<0.10, ** p<0.05, *** p<0.01

           (2) t-statistics in parentheses

           (3) 68,208 manager-game observations.

           (4) 638 unique manager observations

```
    surprise |   .8618333    .0398205     -3.22    0.001      .787216    .9435232
```

Table 3: Head Coach Dismissals and Quits, 2002-2015, Multi-level Mixed Effects Parametric Survival Models

	All Exits	Dismissals	Quits
Team:			
Position end last season	-0.008*	-0.005	-0.011
	(1.80)	(1.00)	(1.22)
Promoted	-0.016	-0.113	0.093
	(0.10)	(0.52)	(0.41)
Relegated	-0.156	0.046	-0.324
	(0.89)	(0.21)	(1.13)
General human capital:			
Age of manager	0.011**	0.015***	0.000
	(2.54)	(2.86)	(0.04)
Year of first coaching job	0.001	0.009	-0.016
	(0.24)	(1.31)	(1.62)
N previous spells as head coach	-0.005	0.014	-0.047**
	(0.48)	(1.06)	(2.28)
Ever experienced coaching abroad	-0.081	-0.109	-0.028
	(1.19)	(1.30)	(0.23)
Promoted to a higher division with a club	-0.059	-0.146**	0.125
	(1.01)	(2.08)	(1.13)
Relegated to a lower division with a club	-0.099	-0.019	-0.317**
	(1.53)	(0.25)	(2.50)
Has won a cup with a club as coach	-0.100	-0.305***	0.239*
	(1.21)	(2.87)	(1.76)
Has won a title with a club as coach	-0.047	-0.067	-0.074
	(0.46)	(0.52)	(0.44)
Currently working in home country	-0.159*	-0.236**	-0.037
	(1.75)	(2.13)	(0.22)
Firm-specific human capital:			
Ex-player with the club	-0.126	-0.079	-0.234
	(1.40)	(0.73)	(1.42)
Number of previous spells coaching the club	-0.148**	-0.282***	0.151
	(2.00)	(2.97)	(1.27)
Hired from within	-0.128	-0.048	-0.328*
	(1.33)	(0.42)	(1.67)
Experience as a player:			
Played for country	-0.048	-0.083	0.014
	(0.63)	(0.89)	(0.10)
N years' experience as a professional footballer	0.009	0.016	0.002
	(1.08)	(1.50)	(0.10)
Played in top league	-0.003	-0.018	-0.007
	(0.04)	(0.19)	(0.04)
Never a professional football player	0.301**	0.385**	0.167
	(2.43)	(2.55)	(0.72)
League:			

Germany	0.004	0.084	-0.161
	(0.05)	(0.80)	(1.03)
Italy	0.568***	0.621***	0.470***
	(6.92)	(6.11)	(3.17)
Spain	0.433***	0.487***	0.348**
	(5.32)	(4.86)	(2.39)
Second tier of the league	0.265***	0.258**	0.17
	(2.65)	(2.24)	(0.80)
Time-varying co-variates:			
Points per game this season	-0.617***	-0.694***	-0.283**
	(9.32)	(8.82)	(2.16)
Games left this season	-0.045***	-0.047***	-0.044***
	(13.99)	(12.98)	(5.44)
Last day of season before closed season	3.434***	2.875***	4.622***
	(43.67)	(30.44)	(25.19)
Points exceed expectations this season	-0.355***	-0.515***	-0.07
	(13.43)	(14.79)	(1.63)
Constant	-8.112	-23.753*	24.628
	(0.71)	(1.69)	(1.22)
Ln_p	-0.079***	-0.115***	0.016
	(2.75)	(3.26)	(0.29)
Head Coach var(_cons)	0	0.009	0
	(0.00)	(0.30)	(0.00)
Season fixed effects?	Yes	Yes	Yes
N managers	638	638	638
N game-manager observations	68,172	68,172	68,172
Log-likelihood	1323.6583	100.18897	524.46646
Chi-sq	0.0000	0.0000	0.0000
Wald	6556.13	3193.67	2602.19

Notes: (1) Significance Key: * $p<0.10$, ** $p<0.05$, *** $p<0.01$
(2) t-statistics in parentheses

Figure 1: Survival Curves for All Coach Exits, by Country
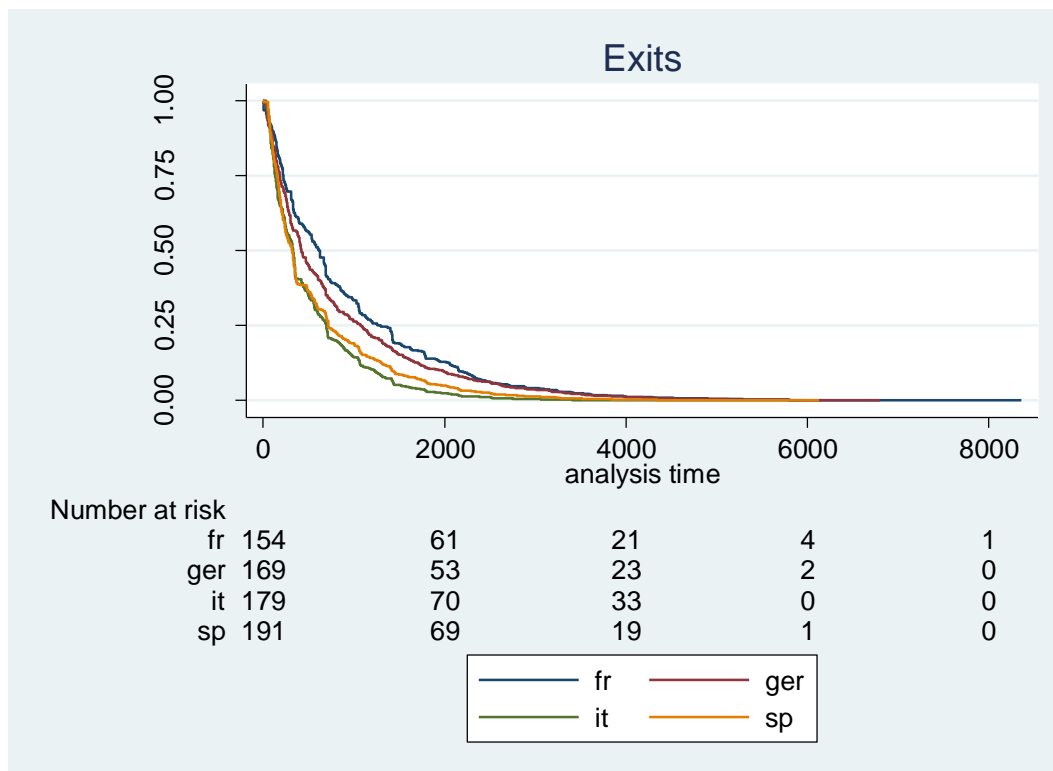
Figure 2: Survival Curves for Dismissals, by Country

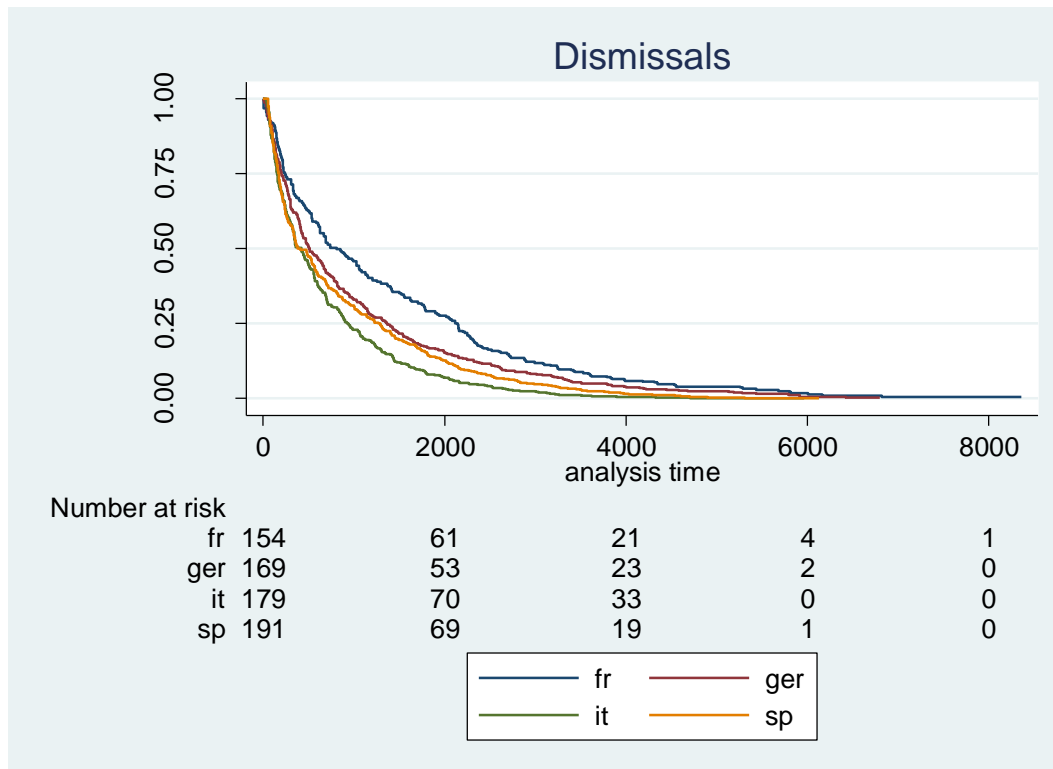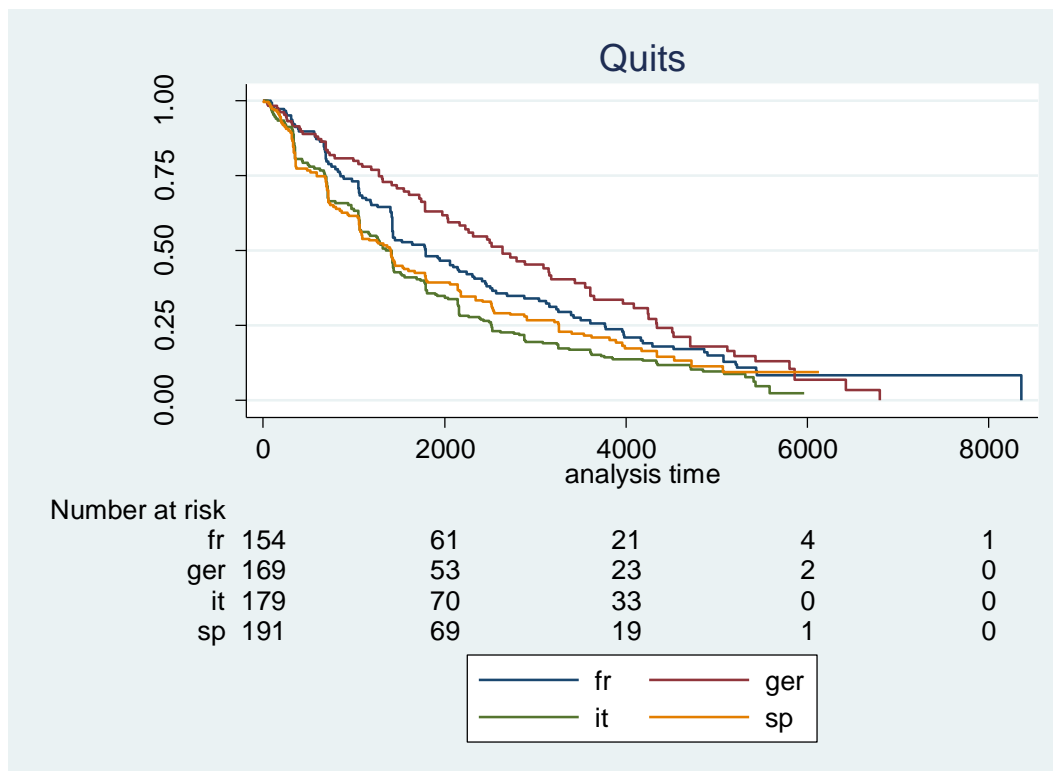Figure 3: Survival Curves for Quits, by Country

Quits

Number at risk				
fr	154	61	21	4	1
ger	169	53	23	2	0
it	179	70	33	0	0
sp	191	69	19	1	0

Legend: fr, ger, it, sp

Appendix Table 1: Descriptive Data for Survival Models

Variable	Obs	Mean	Std. Dev.	Min	Max
leave	68208	.0222848	.1476092	0	1
dismissal	68208	.0158046	.1247198	0	1
quit	68208	.0064655	.0801487	0	1
t	68208	118.3416	99.30536	1	532
ddweibull	68208	4.303106	1.150996	0	6.276643
la~gposition	68208	18.49356	10.94967	1	42
promoted	68208	.0043983	.0661742	0	1
relegated	68208	.0037825	.0613864	0	1
ageofman	68208	47.80556	6.524912	30.9	68.8
firstjob	68208	1997.39	8.62466	1964	2015
prev	68208	4.37522	3.877805	0	23
intexp	68208	.3382741	.4731258	0	1
prom	68208	.5259061	.4993321	0	1
rel	68208	.2564215	.4366604	0	1
cup	68208	.1870455	.3899509	0	1
champ	68208	.1256744	.3314845	0	1
owncntry	68208	.8677135	.3388045	0	1
explayer	68208	.1462878	.3533971	0	1
repeat	68208	.1019529	.3624635	0	4
within	68208	.1239591	.3295373	0	1
intplayer	68208	.2590459	.438114	0	1
playexp	68208	11.99959	6.208929	0	23
playtop	68208	.6732348	.469034	0	1
notplayer	68208	.1441766	.3512713	0	1
germany	68208	.203158	.4023521	0	1
italy	68208	.2696458	.443779	0	1
spain	68208	.2628577	.440189	0	1
_Itier_2	68208	.4423821	.4966727	0	1
ppg	68208	1.388047	.5064827	0	3
gamesleft	68208	18.69627	11.047	0	45
lastday	68208	.0242787	.1539142	0	1
surprise	68208	.0136129	1.197726	-2.707168	2.797083

variable name	storage type	display format	value label	variable label
leave	float	%9.0g		fired or quit
dismissal	float	%9.0g		dismissed
quit	float	%9.0g		quit
time	float	%9.0g		interval identifier
ddweibull	float	%9.0g		weibull duration dependence
lastseasonlon~n	byte	%9.0g		Long position last season (1 - 42)
promoted	byte	%9.0g		Promoted
relegated	byte	%9.0g		Relegated
ageofman	float	%9.0g		Age of manager
firstjob	int	%9.0g		
prev	byte	%10.0g		Number of previous spells as head coach
intexp	byte	%10.0g		International experience (coached abroad)
prom	byte	%10.0g		Has obtained promotion to higher division with a club
rel	byte	%10.0g		Has been with a relegated club
cup	byte	%10.0g		Has won a cup with a club
champ	byte	%10.0g		Has won a title with a club
owncntry	float	%9.0g		coaching in own country
explayer	byte	%10.0g		Has been a player with object team
repeat	byte	%10.0g		Number of previous spells with current club
within	byte	%10.0g		Dummy for hiring from within
intplayer	byte	%10.0g		International player
playexp	byte	%10.0g		Playexp
playtop	byte	%10.0g		Playtop
notplayer	byte	%8.0g		playerpos==N
germany	byte	%8.0g		country==ger
italy	byte	%8.0g		country==it
spain	byte	%8.0g		country==sp
_Itier_2	byte	%8.0g		tier==2

```
ppg               float   %9.2f              Current season's points per game
gamesleft         byte    %9.0g              Games left
lastday           byte    %9.0g              Last day of season
surprise          float   %9.0g              Team points - Expected points
```