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It is Harder, not Easier, to Predict the Winner of the Champions League

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It is Harder, not Easier, to Predict the Winner of the Champions League

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Abstract

European Cup football has experienced a major change in format with the introduction of the Champions League in 1992 and a major change in admission rules with direct qualification for multiple teams from the highest ranked leagues in 1999. We show that, in line with popular press reports and other studies, qualification in lower rounds has become more predictable in the Champions League. At the same time, however, outcomes at later stages have become less predictable. We provide evidence and an explanation.

JEL Classification: L83

Keywords: Champions League, European Cup, Sports Tournaments, Uncertainty of Outcome

1. Introduction

The major European competition among football (soccer) teams, the Champions League, is the most prestigious football club competition in the world. The Champions League is organized as a successor of the European Champion Clubs' Cup – often simply referred to as the “European Cup” – in which national league winners competed in a knockout tournament from its inception in 1955.

Both the popular press and academic studies argue that the change from the European Cup (EC) to the Champions League (CL) has made the CL less exciting and its outcomes more predictable (see e.g. Haan et al., 2002, 2012; Milanovic, 2005; Cross, 2009; Fisher, 2012; Gall, 2012). For example, Milanovic (2005) finds that in the CL the same teams are more likely to qualify for the quarterfinals.

However, the argument that the CL's outcomes are more predictable seems inconsistent with ad hoc observations on the history of EC and CL winners (see Table 1). Several teams were able to win the EC several times in a row. In fact, in 13 out of 37 seasons, the winner of the EC was the winner of the previous season. In contrast, not a single team has been able to win the CL twice in a row.¹ To put it differently, if one would bet on the winner of the championship and put his money on the winner of the previous championship, the chances were 35% that one would win in the EC and 0% in the CL. This observation seems inconsistent with the argument that the CL rules have made the major European competition less exciting and more predictable.

In this paper we first confirm – consistent with Milanovic's (2005) findings – that it is indeed easier to predict who will qualify for lower knockout rounds, such as the round of 16 and the quarterfinals, under the current CL rules. However we also show that the uncertainty of who

¹ Admittedly, whereas 37 EC editions were organized, only 20 CL editions have been organized up to now. We return to this issue when discussing our results.

wins in the competition increases beyond these stages with the CL. So it is harder, not easier, to predict the winner.

We provide an explanation for both empirical findings. Our argument is that the group-round and the new qualification rules of the CL, allowing multiple teams from the highest ranked leagues to directly participate, make it more likely that these teams qualify for the round of 16 – and less likely that teams from lower ranked leagues progress. This is consistent with the earlier argument of less excitement and more predictability. However, we argue further that the same rules also cause smaller quality differences between teams in later rounds of the tournament, making the outcomes of the final rounds less certain and less predictable.

The paper is organized as follows. Section 2 discusses the main differences between the CL and the EC. Section 3 provides the theoretical predictions. Section 4 comments the data, discusses the empirical indicator we use and presents the results. Section 5 concludes.

2. Main Differences between the Champions League and the European Cup

The CL and the EC differ in two aspects: the tournament format and the admission rules (as summarized in Table 2). The EC was established by the UEFA (Union of European Football Associations) in 1955 as a pure knockout tournament between the champions of European national leagues (Granville, 1991).² However, due to complaints from the teams from higher ranked leagues that the knockout format of the EC favored the teams from lower ranked leagues while the value of this competition was dependent on the teams from higher ranked leagues, which attract larger (television) audiences, UEFA introduced a mini-league system into the

² Except for the first edition, where the organizers decided on the playing schedule, the schedule was determined by random draw (UEFA, 2004).

format of the EC in the 1991/92 season (see e.g. King, 2004; Holt, 2007). At the start of the 1992/93 season, UEFA ratified this change of format and renamed the tournament the CL.

The CL initially implied a change from an (unseeded) knockout tournament to a hybrid tournament combining a (seeded) round robin tournament in which groups of four teams compete to determine qualifiers and a (seeded) knockout tournament between the qualified teams (Scarf et al., 2009).³

Later, UEFA also changed the admission rules. As in the EC, the first editions of the CL included only national league champions (and the titleholder). From 1999 onwards multiple teams from the highest ranked leagues were admitted. Since the 1999/2000 season, the runners-up from the six highest ranked leagues, assigned according to the official UEFA coefficients, also directly qualify for the group-round.⁴ Since the 2009/10 season also the third-placed teams of the three highest ranked countries qualify directly.

3. Theoretical Predictions

The operational research literature uses simulation methods to compare match or tournament outcome uncertainty under different tournament formats (see e.g. Appleton, 1995; McGarry and Schutz, 1997; Scarf et al., 2009; Scarf and Yusof, 2011; Koning and McHale, 2012). For this purpose prediction models are used to simulate the expected outcomes of games between two teams. This can then be extended to a complete tournament to obtain estimates for different indicators such as a team's probability to qualify for certain tournament rounds, the probability

³ If tournaments are seeded, highly ranked teams play lowly ranked teams in earlier rounds, which maximizes the probability that the highly ranked teams qualify for later rounds (see e.g. Noll, 2003; Monks and Husch, 2009).

⁴ The UEFA coefficients are calculated based on the performance of teams from each country in the main European club competitions, the CL and the Europa League. In general, each participating team gets two points for a win, one point for a draw and some bonus points for qualifying for later tournament rounds. The UEFA coefficient assigned to a country is the sum of points obtained by all the participating teams from that country divided by the number of those teams.

that the team with the highest ranking before the tournament wins the tournament, the correlation between a team's pre- and post-tournament ranking, etc.

The tournament format influences these tournament outcomes. Scarf et al. (2009) simulate CL outcomes for 11 different possible tournament formats. The simulated formats include the “unseeded 2 leg knockout” structure (which was the format of the EC) and the “seeded 1 group-round and 2 leg seeded knockout in later rounds” structure (the current format of the CL). The simulation estimates show that the average ranking of the teams that qualify for the different knockout rounds in later rounds is higher for the current CL format than for the EC format. This suggests that on average the highly ranked teams who participate in the tournament are more likely to qualify for the round of 16 in the CL than in the EC, and vice versa for lowly ranked teams.

These simulation results do not take into account the effect of UEFA's decision to allow multiple teams from the highest ranked leagues to qualify directly for the CL (compared to only one team per league for the EC). Because of this decision it is more likely that a specific highly ranked team from one of the highest ranked leagues qualifies year after year since they qualify even if they do not win the title in their national league but end second (or third). Additionally, it is more difficult for a team from a lower ranked league to qualify since only the champions qualify for their national leagues (as in the EC) and since fewer spots remain to directly qualify for the group-round.

These two effects from UEFA's decision to allow multiple teams from the highest ranked leagues to qualify directly for the CL suggests that a specific highly ranked team from one of the highest ranked leagues is more likely to qualify for the round of 16 in the CL than in the EC, and vice versa for a team from a lower ranked league.

However, another effect of UEFA's decision to allow multiple teams from the highest ranked leagues to qualify directly for the CL (compared to only one team per league for the EC) and of the knockout format versus the hybrid format is that the average ranking of the qualified teams is higher, and that the quality difference between the teams is smaller at later stages in the tournament. This implies that while it is less likely that a team from a lower ranked league progresses to the round of 16, it is also more difficult for a specific highly ranked team from one of the highest ranked leagues to progress at later stages in the tournament.

In sum, the introduction of the group-round and the rule change towards direct qualification for multiple teams from the highest ranked leagues has made it more likely for a specific highly ranked team from one of the highest ranked leagues to qualify for the round of 16 in the CL than in the EC and – at the same time – less likely to qualify for later stages in the CL than in the EC. Hence, we predict that on average it is easier to predict who will qualify for the lower rounds in the CL than in the EC and harder to predict who will qualify for later stages in the CL than in the EC.

4. Empirical Evidence

Table 3 and Table 4 present summary statistics on the number of teams that reached various stages in the EC and the CL. More detailed data on all teams and their performance in the EC and the CL can be found in Appendix.

192 teams reached the round of 16 in the EC at least once over the 1955-1991 period. For the CL this was 84 teams over the 1992-2011 period. What matters, of course, is the average number. Comparing the number of teams that reached the round of 16 and the quarterfinals over five-year periods in the EC with the CL, we observe that these numbers are substantially lower in

the CL than in the EC. Over five-year periods the number of round of 16 participants was almost always at least 50 in the EC. Except for the first CL editions, this number decreased to less than 40 in the CL. Similarly, while over five-year periods on average 29 teams have reached the quarterfinals in the EC, except for the first CL editions not more than 22 teams have been able to reach this round in the CL.

The difference in the number of qualified teams between the CL and the EC is smaller and even reversed at later stages in the tournament. On average 15 teams have reached the semifinals in a five-year period in the EC, compared to 12 in the CL. Over five-year periods, on average seven teams have reached the finals in the EC and six teams in the CL. Finally, on average more different teams (4) won the CL than the EC (3).

To provide better evidence for our theoretical predictions, we calculate an indicator which is commonly used in the literature, i.e. “uncertainty of outcome”. The literature identifies three different levels of uncertainty of outcome (UO): for a match, a season and a championship (see e.g. Szymanski, 2003; Buzzacchi et al., 2003; Goossens, 2006). Most studies have focused on uncertainty of outcome for a particular match or season.

The focus of our study is on UO in the CL and the EC, which is a “dynamic” measure, i.e. it measures particular teams’ dominance of a championship and the predictability of the winners *across* seasons. Following Hadley et al. (2005) and Pawlowski et al. (2010), we use a Markov model to compare UO between two periods.⁵ In a Markov process the outcome at time $t + 1$ is determined by the state at time t (Krautmann and Hadley, 2006). The probability that a particular entity i will transition from one state at time t , $S_{i,t}$, to another state at time $t + 1$,

⁵ Hadley et al. (2005) use the Markov model to compare a team’s probability of qualifying for postseason play in Major League Baseball (MLB), the highest level of professional American baseball in the United States, before and after the players’ strike in 1994. Pawlowski et al. (2010) use the Markov model to compare a top team’s probability of qualifying for the CL group-round before and after the change of the distribution system of CL revenues in 1999.

$S_{i,t+1}$, is called the “transitional probability”. In our case the entity is a football team and the two states refer to qualification for a particular tournament round: either team i qualified or team i did not qualify. For each knockout round, we assign a dummy variable equal to 1 if team i qualified and equal to 0 if team i did not qualify. For each of the dummy variables, four transitional probabilities can be calculated (see e.g. Koop, 2003):

$$p_{00} = Pr(S_{i,t+1} = 0/S_{i,t} = 0); \quad (1)$$

$$p_{01} = Pr(S_{i,t+1} = 1/S_{i,t} = 0); \quad (2)$$

$$p_{10} = Pr(S_{i,t+1} = 0/S_{i,t} = 1); \quad (3)$$

$$p_{11} = Pr(S_{i,t+1} = 1/S_{i,t} = 1), \quad (4)$$

where p_{00} is the probability that team i repeats in not qualifying across two seasons, p_{01} the probability that team i goes from not qualifying in one season to qualifying in the next season, p_{10} the probability that team i goes from qualifying in one season to not qualifying in the next season and p_{11} the probability that team i repeats in qualifying across two seasons.

Table 5 presents the UO indicators and Figure 1 shows the difference in the UO indicator between the CL and the EC for the various knockout rounds and for winning the tournament. Figure 1 shows that the difference in the UO indicator between the CL and the EC is negative for the round of 16, the quarterfinals and the semifinals. On the other hand, the difference in the UO indicator between the CL and the EC is positive for the finals and for winning the tournament. These empirical indicators are consistent with our hypotheses that it is easier to predict who will qualify for lower rounds in the CL than in the EC and that, at the same time, it is harder to predict who will qualify for later stages in the CL than in the EC.⁶

⁶ UEFA introduced the group-round in the 1991/92 season but officially renamed the tournament the CL in the 1992/93 season. Our results are robust to switching the data from the 1991/92 season between the EC era and the CL era.

Next, we can try to see which of the rule changes under the CL was crucial in causing the effects. As we explained in Section 2, the current CL implied two key changes compared to the EC: the tournament format and the admission rules. The second change (direct qualification for multiple teams from the highest ranked leagues) was implemented only in 1999 when the CL was already in place for several years. Figure 2 shows the difference in UO indicators between the CL after 1999 and before 1999. There is a strong relationship. The difference in the UO indicator is negative for the round of 16 and the quarterfinals. There is almost no difference in the semifinals and the difference in the UO indicator is positive for the finals. This suggests that it is in particular the change in the admission rules that makes it easier to predict who will qualify for lower rounds in the CL and harder to predict who will qualify for later stages in the CL.

Finally, as Eckard (1998, 2001) and Pawlowski et al. (2010), we also compare our empirical indicator over periods of equal length to check whether our results are not driven by the longer sample period of the EC. We split the EC sample into two periods (practically) equal to the CL period: the 1955-1973 period and the 1973-1991 period. Table 5 shows that there are only small differences in the UO indicator between the two EC periods for the round of 16, the quarterfinals and the semifinals. There is a larger difference in the UO indicator for the finals and for winning the tournament, with the UO indicator lower for the early period. However, regardless of the EC period under comparison, uncertainty of the final outcome of the tournament is considerably higher in the CL than in the EC.⁷

⁷ Also the results of the difference in uncertainty of outcome between the CL after and before 1999 are robust to comparing our empirical indicator over periods of equal length. Results are available upon request.

5. Conclusion

In this paper we empirically examine how the change in format with the introduction of the Champions League in 1992 and the change in admission rules with direct qualification for multiple teams from the highest ranked leagues in 1999 affected uncertainty of outcome in European Cup football.

We first explain how the introduction of the group-round and the new admission rules has made it more likely for a specific highly ranked team from one of the highest ranked leagues to qualify for the round of 16 in the Champions League than in the European Cup. This is consistent with the existing argument of less excitement and more predictability in the Champions League. However, we also argue that the same rules cause smaller quality differences between teams in later rounds of the tournament. This has made it less likely for a specific highly ranked team from one of the highest ranked leagues to qualify for later stages in the Champions League than in the European Cup, making the outcomes of the later rounds in the Champions League less certain and less predictable.

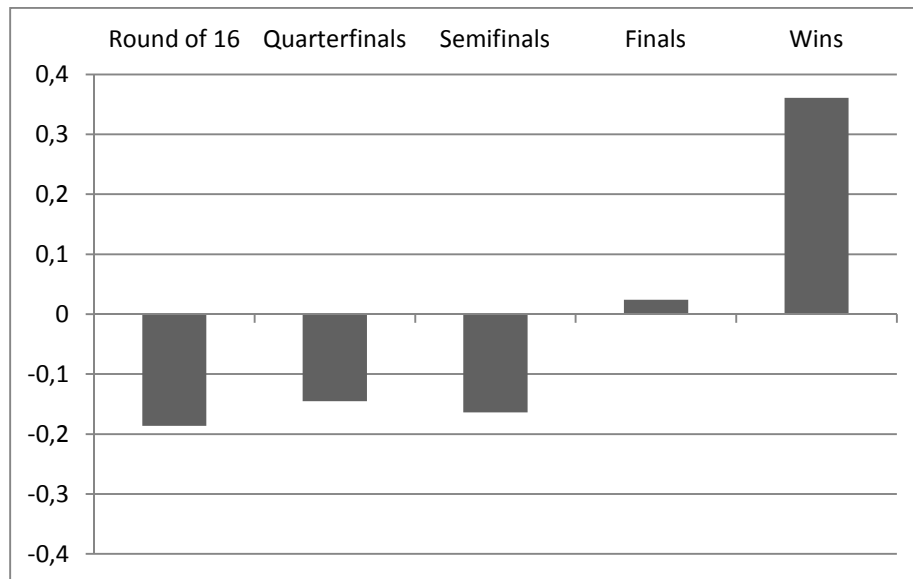
Through a comparison of differences in uncertainty of outcome between the Champions League and the European Cup and between the Champions League after 1999 and before 1999, we confirm that it indeed is easier to predict who will qualify for lower rounds such as the round of 16 and the quarterfinals in the Champions League. However, we also show that it is harder to predict who will qualify for later stages such as the finals and who will win the tournament. So it is harder, not easier, to predict the winner of the Champions League.

References

- Appleton, D.R. (1995). May the Best Man Win?. *Journal of the Royal Statistical Society: Series D*, 44(4), 529-538.
- Buzzacchi, L., Szymanski, S., & Valletti, T.M. (2003). Equality of Opportunity and Equality of Outcome: Open Leagues, Closed Leagues and Competitive Balance. *Journal of Industry, Competition and Trade*, 3(3), 167-186.
- Cross, J. (2009). Why Successful English Teams Have Made the Champions League Predictable and Boring. Article Available at <http://www.mirrorfootball.co.uk>, 12 March 2009.
- Eckard, W.E. (1998). The NCAA Cartel and Competitive Balance in College Football. *Review of Industrial Organization*, 13(3), 347-369.
- Eckard, W.E. (2001). Free Agency, Competitive Balance, and Diminishing Returns to Pennant Contention. *Economic Inquiry*, 39(3), 430-443.
- Fisher, S. (2012). What Would an Expanded Champions League Mean for Scottish Clubs. Article Available at <http://www.heraldsotland.com>, 29 November 2012.
- Goosens, K. (2006). Competitive Balance in European Football: Comparison by Adapting Measures: National Measure of Seasonal Imbalance and Top 3. *Rivista Di Diritto Ed Economia Dello Sport*, 2(2), 77-122.
- Granville, B. (1991). *Champions of Europe*. Enfield: Guinness Publishing.
- Haan, M.A., Koning, R.H., & van Witteloostuijn, A. (2002). Market Forces in European Soccer. *SOM Research Report*, Faculty of Economics, Groningen.
- Haan, M.A., Koning, R.H., & van Witteloostuijn, A. (2012). The Effect of Institutional Change in European Soccer. *Journal of Economics and Statistics*, 232(3), 318-335.
- Hadley, L., Ciecka, J., & Krautmann, A.C. (2005). Competitive Balance in the Aftermath of the 1994 Players' Strike. *Journal of Sports Economics*, 6(4), 379-389.
- Holt, M. (2007). The Ownership and Control of Elite Club Competition in European Football. *Soccer & Society*, 8(1), 50-67.
- Gall, J. (2012). The Problem With Football Today: Europe. Article Available at <http://www.dailysensible.co.uk>, 6 March 2012.
- King, A. (2004). The New Symbols of European Football. *International Review for the Sociology of Sport*, 39(3), 323-336.
- Koning, R.H., & McHale, I. (2012). Estimating Match and World Cup Winning Probabilities. In W. Maennig & A. Zimbalist (Eds.), *International Handbook on the Economics of Mega Sporting Events* (pp. 177-193). Cheltenham and Northampton: Edward Elgar.
- Koop, G. (2003). Modelling the Evolution of Distributions: An Application to Major League Baseball. *Journal of the Royal Statistical Society: Series A*, 167(4), 639-655.
- Krautmann, A.C., & Hadley, L. (2006). Dynasties versus Pennant Races: Competitive Balance in Major League Baseball. *Managerial and Decision Economics*, 27(4), 287-292.

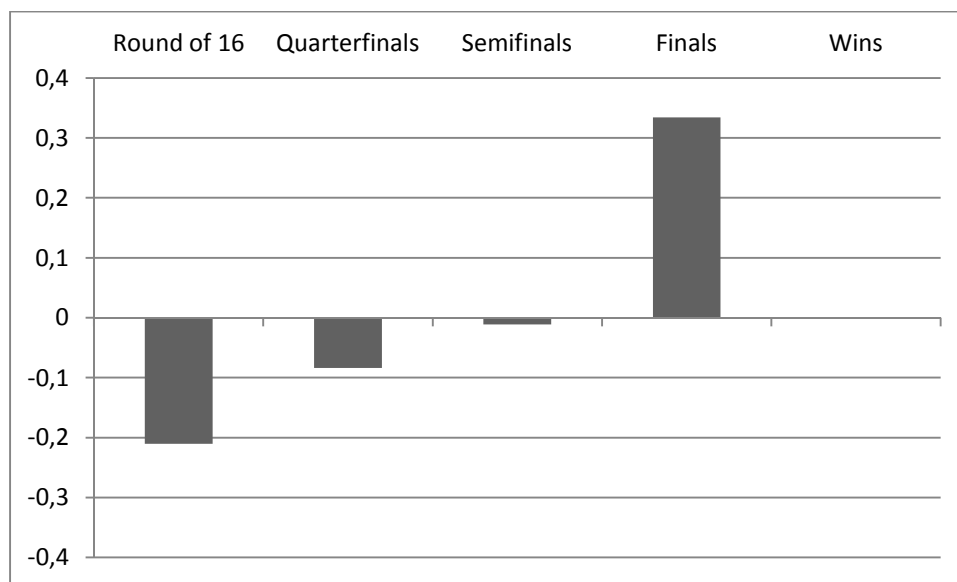
- McGarry, T., & Schutz, R.W. (1997). Efficacy of Traditional Sport Tournament Structures. *The Journal of the Operational Research Society*, 48(1), 65-74.
- Milanovic, B. (2005). Globalization and Goals: Does Soccer Show the Way?. *Review of International Political Economy*, 12(5), 829-850.
- Monks, J., & Husch, J. (2009). The Impact of Seeding, Home Continent and Hosting on FIFA World Cup Results. *Journal of Sports Economics*, 10(4), 391-408.
- Noll, R. (2003). The Organization of Sports Leagues. *Oxford Review of Economic Policy*, 19(4), 530-551.
- Pawlowski, T., Breuer, C., & Hovemann, A. (2010). Top Clubs' Performance and the Competitive Situation in European Domestic Football Competitions. *Journal of Sports Economics*, 11(2), 186-202.
- Scarf, P.A., & Yusof, M.M. (2011). A Numerical Study of Tournament Structures and Seeding Policy for the Soccer World Cup Finals. *Statistica Neerlandica*, 65(1), 43-57.
- Scarf, P., Yusof, M.M., & Bilbao, M. (2009). A Numerical Study of Format for Sporting Contests. *European Journal of Operational Research*, 198(1), 190-198.
- Szymanski, S. (2003). The Economic Design of Sporting Contests. *Journal of Economic Literature*, 41(4), 1137-1187.
- UEFA (2004). *50 Years of the European Cup*. Nyon: UEFA.
- UEFA (2012). *Regulations of the UEFA Champions League 2012-15 Cycle*. Nyon: UEFA.

Figure 1: Differences in uncertainty of outcome between the Champions League (1992-2011) and the European Cup (1955-1991)



Notes: (i) The Figure shows the difference in the teams' average probability of qualifying for the different knockout rounds (or winning) in one season and not qualifying (or not winning) in the next season between the Champions League and the European Cup. A positive difference is associated with higher uncertainty of outcome in the Champions League and vice versa.

Figure 2: Differences in uncertainty of outcome between the Champions League after 1999 (1999-2011) and before 1999 (1992-1998)



Notes: (i) The Figure shows the difference in the teams' average probability of qualifying for the different knockout rounds (or winning) in one season and not qualifying (or not winning) in the next season between the Champions League after and before 1999. A positive difference is associated with higher uncertainty of outcome after 1999 and vice versa. (ii) No club has won the Champions League twice in a row, such that the difference in uncertainty of outcome between the Champions League after 1999 and before 1999 equals 0 for this stage.

Table 1: European Cup and Champions League winners

European Cup		Champions League	
Season	Team	Season	Team
1955/56	Real Madrid	1992/93	Olympique Marseille
1956/57	Real Madrid	1993/94	AC Milan
1957/58	Real Madrid	1994/95	Ajax
1958/59	Real Madrid	1995/96	Juventus
1959/60	Real Madrid	1996/97	Borussia Dortmund
1960/61	Benfica	1997/98	Real Madrid
1961/62	Benfica	1998/99	Manchester United
1962/63	AC Milan	1999/2000	Real Madrid
1963/64	Internazionale	2000/01	Bayern München
1964/65	Internazionale	2001/02	Real Madrid
1965/66	Real Madrid	2002/03	AC Milan
1966/67	Celtic	2003/04	FC Porto
1967/68	Manchester United	2004/05	Liverpool
1968/69	AC Milan	2005/06	FC Barcelona
1969/70	Feyenoord	2006/07	AC Milan
1970/71	Ajax	2007/08	Manchester United
1971/72	Ajax	2008/09	FC Barcelona
1972/73	Ajax	2009/10	Internazionale
1973/74	Bayern München	2010/11	FC Barcelona
1974/75	Bayern München	2011/12	Chelsea
1975/76	Bayern München		
1976/77	Liverpool		
1977/78	Liverpool		
1978/79	Nottingham Forest		
1979/80	Nottingham Forest		
1980/81	Liverpool		
1981/82	Aston Villa		
1982/83	Hamburger SV		
1983/84	Liverpool		
1984/85	Juventus		
1985/86	Steaua Bucuresti		
1986/87	FC Porto		
1987/88	PSV Eindhoven		
1988/89	AC Milan		
1989/90	AC Milan		
1990/91	Red Star Belgrade		
1991/92	FC Barcelona		

Notes: (i) Data are gathered from UEFA.

Table 2: Main changes in tournament format and admission rules

Period	Tournament format	Directly qualified teams
1955-90	knockout	1 st from each country
1991-93	knockout, 1 group-round	1 st from the majority of countries
1994-1998	1 group-round, knockout	1 st from country ranked 1-8
1999-2002	2 group-round, knockout	1 st from country ranked 1-10, 2 nd from 1-6
2003-08	1 group-round, knockout	1 st from country ranked 1-10, 2 nd from 1-6
From 2009	1 group-round, knockout	1 st from country ranked from 1-12, 2 nd from 1-6, 3 rd from 1-3

Notes: (i) Tournament format refers to the tournament excluding qualifying or preliminary rounds. (ii) Before the 1966/67 season, preliminary rounds coincided with first rounds. (iii) Except for the final, games have always been played in two legs – one home game and one away game for each team. (iv) The group-round in the 1993/94 season was followed by a knockout round between semifinalists. (v) From the inception of the EC, the titleholder also qualifies directly for next season's campaign. See UEFA (2012) for implications for other teams from the same country if the titleholder does not qualify through its national competition. (vi) The number of UEFA countries increased substantially during the 1991-93 period because of the dissolution of socialist political entities like the Soviet Union, Yugoslavia and Czechoslovakia.

Table 3: Number of teams that reached various stages in the European Cup

Round	Period	1955-91	1955-91	1955-59	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89
		91	5-year average	59	64	69	74	79	84	89
Round of 16		192	54	56	56	60	55	46	52	50
Quarterfinals		112	29	30	31	29	29	27	30	26
Semifinals		62	15	13	16	15	15	16	16	13
Finals		33	7	5	6	9	7	8	7	7
Wins		19	3	1	3	5	2	3	4	4

Notes: (i) The theoretical maximum number of teams reaching the various stages respectively equals 80, 40, 20, 10 and 5. (ii) Data from the 1990/91 season and from the 1991/92 season are excluded from the last column for comparability reasons.

Table 4: Number of teams that reached various stages in the Champions League

Round	Period	1992-2011	1992-2011	1992-96	1997-2001	2002-06	2007-11
		2011	5-year average	96	2001	06	11
Round of 16		84	39	50	38	33	37
Quarterfinals		50	23	29	22	20	22
Semifinals		27	12	13	11	14	10
Finals		12	6	6	6	7	5
Wins		13	4	5	3	4	4

Notes: (i) The theoretical maximum number of teams reaching the various stages respectively equals 80, 40, 20, 10 and 5. (ii) There was no semifinal during the 1992/93 season and no round of 16 during the 1997/98 season and the 1998/99 season.

Table 5: Uncertainty of outcome in the Champions League and the European Cup

Round	Period	Champions League			European Cup		
		1992- 2011	1992- 98	1999- 2011	1955- 91	1955- 73	1973- 91
Round of 16		0,535	0,648	0,438	0,721	0,712	0,725
Quarterfinals		0,612	0,667	0,583	0,757	0,771	0,743
Semifinals		0,635	0,636	0,625	0,799	0,806	0,792
Finals		0,816	0,583	0,917	0,792	0,75	0,833
Wins		1	1	1	0,639	0,556	0,722

Notes: (i) The Table shows the teams' average probability of qualifying for the different knockout rounds (or winning) in one season and not qualifying (or not winning) in the next season for various periods of the Champions League and the European Cup. A higher average probability is associated with higher uncertainty of outcome and vice versa.

Appendix

Table A.1: Performance of teams in the European Cup (for teams which qualified at least once for the round of 16 in the EC)

Team	Round of 16	Quarterfinals	Semifinals	Finals	Wins
SK Tirana	88;89				
Arat Yerevan		74			
Austria Wien	61;62;81;85;86	84	78		
Gwardia Warsaw	55				
Rapid Wien	56;64;67;82;87	55;68;83	60		
Wacker Innsbruck	89;90	77			
Wiener Sportklub		58;59			
Anderlecht	55;64;66;67;68;72	62;65;74;86;87;91	81;85		
Club Brugge	73;88;90	76		77	
KV Mechelen		89			
Royal Antwerp	57				
RWD Molenbeek	75				
SK Beveren	84				
Standard Liège	70;82;83	58;69;71	61		
Dinamo Minsk		83			
FK Sarajevo	67				
CDNA Sofia	58;60;62;71;72;82;83;90	56;73;80;89	66;81		
Levski Sofia	65;77;84				
Lokomotiv Sofia	64;78				
Spartak Plovdiv	63				
Hajduk Split	74	75;79			
Apoel Nicosia	86				
Apollon Limassol	91				
Omonia Nicosia	72;79;85;87				
Banik Ostrava	76;81	80			
Bohemians Praha	83				
Dukla Praha	57;58;64;79	61;62;63	66		
Hradec Kralove		60			
Sparta Praha	87;89	65;67;84;91			
TJ Vitkovice	86				
Zbrojovka Brno	78				
AB København	68				
AGF Aarhus	55;57;87	60			
B1903 København	77				
B1909 Odense	59				
B1913 Odense	61				
Brøndby IF	91	86			
Esbjerg fB	62;80				
Hvidovre IF	67				
KB København	81				
Lyngby BK	84				
Vejle BK	73;79				
Arsenal	91	71			
Aston Villa		82			81
Burnley		60			
Derby County	75		72		
Everton		70			
Ipswich Town	62				
Leeds United			69	74	
Liverpool	66;73	81;82	64	84	76;77;80;83
Manchester United			56;57;65;68		67
Nottingham Forest					78;79
Tottenham Hotspur			61		
Wolverhampton Wanderers	58	59			
Haka Valkeakoski	61				
HJK Helsinki	74;82				
HPS Helsinki	58				
Kuusysi Lahti		85			
Reipas Lahti	68				
TPS Turku	76				
AS Monaco	63	88			
AS Saint-Etienne	67;69	76	74	75	

Team	Round of 16	Quarterfinals	Semifinals	Finals	Wins
FC Nantes	66;77;80				
Girondins Bordeaux		87	84		
OGC Nice		56;59			
Olympique Marseille	71;91		89	90	
RC Strasbourg		79			
Stade de Reims	60	62		55;58	
Dinamo Tbilisi	79				
1. FC Magdeburg	72;74				
1. FC Kaiserslautern	91				
1. FC Köln		64	78		
1. FC Nürnberg		61			
1. FC Saarbrücken	55				
Bayern München		72;76;85;87	80;89;90	81;86	73;74;75
BFC Dynamo Berlin	80;81;84;86	79;83			
Borussia Dortmund	56	57	63		
Borussia Mönchengladbach	70;71	75	77	76	
Carl Zeiss Jena		70			
Dynamo Dresden	73;77	76;78;90			
Eintracht Braunschweig		67			
Eintracht Frankfurt				59	
Hamburger SV	83		60	79	82
Rot-Weiß Essen	55				
Schalke 04		58			
TSV 1860 München	66				
Vorwärts Berlin	61;65	69			
Werder Bremen	65	88			
Wismut Karl-Marx-Stadt	57;60	58			
AEK Athens	78;89	68			
Olympiakos Piraeus	74;82;83				
PAOK Thessaloniki	76				
Panathinaikos	60;64;65;77	91	84	70	
ETO Győr	83		64		
Ferencváros	69;76	65			
Honvéd Budapest	56;80;85;89;91				
MTK Budapest	58	55			
Ujpest Dozsá	60;74;75	71;72	73		
Vasas Budapest	62;66	67	57		
IA Akranes	75				
Valur Reykjavík	67				
Bohemians Dublin	78				
Cork Celtic	74				
Derry City	65				
Dundalk	79				
Waterford United	70				
AC Milan	59;69	63;90	55	57	62;68;88;89
AS Roma				83	
Cagliari	70				
Fiorentina		69		56	
Hellas Verona	85				
Internazionale			65;80	66;71	63;64
Juventus	75;81;86	61;85	67;77	72;82	84
Napoli	90				
Sampdoria				91	
Torino	76				
Jeunesse d'Esch	59;63				
Sliema Wanderers	71				
AZ Alkmaar	81				
Ajax	73;80	57;66;77	79	68	70;71;72
DWS Amsterdam		64			
Feyenoord	61;74	71	62		69
PSV Eindhoven	55;76;78;91	63;88;89	75		87
Rapid JC Heerlen	56				
Sparta Rotterdam		59			
Glentoran	77;81				
Linfield Belfast	84	66			
Fredrikstad FK	60				
Lillestrøm SK	78;87				
Lyn Oslo	64				
Rosenborg BK	86				

Team	Round of 16	Quarterfinals	Semifinals	Finals	Wins
Välerengen IF	66				
Górník Zabrze	63;65;66;72;87;88	67			
Lech Poznan	90				
Legia Warsaw		70	69		
Polonia Bytom	62				
Ruch Chorzow	75	74			
Szombierki Bytom	80				
Widzew Łódź			82		
Wisla Kraków		78			
Benfica	63;69;72;73;81;84	65;68;75;77;83;91	71	62;64;67;87;89	60;61
FC Porto	79;85;87;88	90			86
Sporting CP Lisbon	55;58;62;70	82			
Arges Pitesti	72;79				
CCA Bucuresti	57;86;89		87	88	85
Dinamo Bucuresti	56;63;64;65;71;73;82;84;90		83		
Rapid Bucuresti	67				
Universitatea Craiova		81			
UT Arad	70				
CSKA Moscow	71				
Spartak Moscow	88	80	90		
Zenit Leningrad	85				
Aberdeen	80	85			
Celtic	72;77;82;86;88	68;70;79	71;73	69	66
Dundee FC			62		
Dundee United			83		
Glasgow Rangers	56;57;75;90	61;64;78;87	59		
Hibernian			55		
Kilmarnock	65				
Red Star Bratislava	59				
Slovan Bratislava	56;70				
Spartak Trnava	69	72;73	68		
Athletic Bilbao	83	56			
Atlético Madrid	66	77	58;70	73	
FC Barcelona			59;74	60;85	91
Real Madrid	60;68;69;76;78;89	64;66;90	67;72;75;79;86;87;88	61;63;80	55-59;65
Real Sociedad			82		
Sevilla		57			
Valencia	71				
Atvidabergs FF		74			
Djurgårdens IF		55			
IFK Göteborg	58;59;91	84;88	85		
IFK Malmö		60			
IFK Norrköping	56;57;62;63				
Malmö FF	75;89;90			78	
FC Basel	70;80	73			
FC Zürich			63;76		
Grasshoppers Zürich	71;84	56;78			
La Chaux-de-Fonds	64				
Servette FC Genève	55;61;79;85				
Xamax Neuchâtel	87;88				
Young Boys	57;59;60		58		
Besiktas	58	86			
Fenerbahce	59;61;68;74;85				
Galatasaray	63	62;69	88		
Trabzonspor	76				
Dinamo Kiev	67;69;78	72;75;81;82;91	76;86		
Dnipro Dnipropetrovsk		84;89			
Zaria Voroshilovgrad	73				
Partizan Belgrade	61;83	55;63		65	
Red Star Belgrade	59;68;69;77;88	57;73;80;81;86;91	56;70		90
Vojvodina Novi Sad		66			

Notes: (i) Data are gathered from UEFA. (ii) The order of the teams is by nationality (with alphabetic ranking of the countries). (iii) In case a team merged during the EC period, the Table shows the name of the team during their first EC round of 16 participation. (iv) 2 teams did not have to play the round of 16 during the 1968/69 season and one team did not have to play the round of 16 during the 1982/83 season, such that the number of round of 16 observations equals 293 rather than 296. (v) There was no semifinal during the 1991/92 season such that the number of quarterfinals observations equals 150 rather than 148 and the number of semifinals observations equals 72 rather than 74.

Table A.2: Performance of teams in the Champions League (for teams which qualified at least once for the round of 16 in the CL)

Team	Round of 16	Quarterfinals	Semifinals	Finals	Wins
Austria Salzburg	94				
Austria Wien	92;93				
Rapid Wien	96				
Sturm Graz	00				
Anderlecht	94;00	93			
Club Brugge		92			
Levski Sofia	93				
Hajduk Split		94			
Apoel Nicosia		11			
Sparta Praha	93;99;01;03				
AaB Aalborg	95				
FC København	93;10				
Arsenal	01;02;04;06;10;11	00;03;07;09	08	05	
Blackburn Rovers	95				
Chelsea	05;09	99;10	03;04;06;08	07	11
Leeds United	92		00		
Liverpool	05	01;08	07	06	04
Manchester United	93;94;03;04	97;99;00;02;09	96;01;06	08;10	98;07
Newcastle United	02				
Tottenham Hotspur		10			
AJ Auxerre		96			
AS Monaco	04		93;97	03	
FC Nantes	01		95		
Girondins Bordeaux	99	09			
Lille OSC	06				
Olympique Lyon	00;06;07;08;10;11	03;04;05	09		
Olympique Marseille	99;10	11			92
Paris Saint-Germain	00		94		
1. FC Kaiserslautern		98			
Bayer Leverkusen	02;04;11	97		01	
Bayern München	03;05;10	97;01;04;06;08	94;99	98;09;11	00
Borussia Dortmund	02	95	97		96
Hertha BSC	99				
Schalke 04		07	10		
VfB Stuttgart	03;09				
Werder Bremen	04;05	93			
AEK Athens	92;94				
Olympiakos Piraeus	07;09	98			
Panathinaikos	00;08	01	95		
Ferencváros	95				
AC Milan	96;00;07;09;10	03;11	05	92;94;04	93;02;06
AS Roma	01;02;08;10	06;07			
Fiorentina	99;09				
Internazionale	06;07;08;11	98;04;05;10	02		09
Juventus	01;03;08	04;05	98	96;97;02	95
Lazio Roma	00	99			
Napoli	11				
Ajax	05	02	96	95	94
Feyenoord	93;99				
PSV Eindhoven	05	92;06	04		
Rosenborg BK	95;99	96			
Lech Poznan	92;93				
Legia Warsaw		95			
Widzew Łódź	96				
Benfica		94;05;11			
Boavista	01				
FC Porto	95;01;04;06;07;09	92;96;99;08	93		03
Sporting CP Lisbon	08				
Dinamo Bucuresti	92				
Steaua Bucuresti	93;94;95;96				
CSKA Moscow	11	92;09			
Lokomotiv Moscow	02;03				
Spartak Moscow	94;00	93;95			
Zenit St. Petersburg	11				
Celtic	06;07				

Team	Round of 16	Quarterfinals	Semifinals	Finals	Wins
Glasgow Rangers	95;96;05	92			
Slovan Bratislava	92				
Atlético Madrid	08	96			
Celta de Vigo	03				
Deportivo de la Coruña	02	00;01	03		
FC Barcelona	92;04;06	94;02	99;01;07;09;11	93	05;08;10
Real Madrid	04;05;06;07;08;09	95;98;03	00;02;10;11		97;99;01
Real Sociedad	03				
Sevilla	07;09				
Valencia	10	02;06		99;00	
Villarreal		08	05		
IFK Göteborg	96	92;94			
FC Basel	02;11				
FC Sion	92				
Grasshoppers Zürich	95;96				
Fenerbahce	96	07			
Galatasaray	94;01	93;00			
Dinamo Kiev	94;99	97	98		
Shakhtar Donetsk		10			

Notes: (i) Data are gathered from UEFA. (ii) The order of the teams is by nationality (with alphabetic ranking of the countries). (iii) In case a team merged during the CL period, the Table shows the name of the team during their first CL round of 16 participation. (iv) There was no round of 16 during the 1997/98 season and during the 1998/99 season, such that the number of round of 16 observations equals 144 rather than 160. (v) There was no semifinal during the 1992/93 season, such that the number of quarterfinals observations 82 rather than 80 and the number of semifinals observations 38 rather than 40.