Real Academia
de Ciencias Económicas y Financieras

SEMINARIO INTERNACIONAL

Economics, Management and Optimization in Sports.

After the Impact of the Financial Crisis

Barcelona, 1, 2 y 3 de Diciembre de 2009

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International Conference

ECONOMICS, MANAGEMENT AND OPTIMIZATION IN SPORTS.
AFTER THE IMPACT OF FINANCIAL CRISIS.

Real Academia de Ciencias Económicas y Financieras
Barcelona, December 1st, 2nd and 3rd 2009

The Royal Academy of Economic and Financial Sciences of Spain holds the International Conference "Economics, Management and Optimization in Sports. After the impact of the Financial Crisis", for all the professionals of the sports realm.

For three days, recognized scholars and professionals will tackle the problem of the adaptation of sports entities to the changing conditions of the economic, social, political and technological environment. It's a good occasion to analyze, from multiple points of view, the demands that come from the interaction between sports and economy.

The organization invites personalities from the academic world and specialist on the subject to present scientific or empiric investigations that analyze the current economic and financial situations of the sports societies and entities in the changing, unstable and uncertain circumstances we're living, with the purpose of creating, in Barcelona, a discussion forum with social, technical and economic value.

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Laura Vianello

Tuesday, December 1st

15h50 REGISTER AND HANDING OVER OF THE DOCUMENTS TO ATTENDANTS AT THE ROYAL ACADEMY OF ECONOMIC AND FINANCIAL SCIENCES
(Via Laietana, 32. 4th floor, door nº 91)

17h00 OPENING ACT OF THE SEMINAR. INAGURAL SESSION.

***Jaime Gil Aluja**, President of the Real Academia de las Ciencias Económicas y Financieras.*
***Alberto Agustí García-Navarro**, President of the Real Club de Tenis Barcelona*

18h00 Round Table
"THE CHALLENGE OF SPORTS TOWARDS THE UNCERTAINITY OF THE FUTURE"
*Chairman: **Josep Pons**, President of Josep Pons Imatge*

***Àngel Alonso**, Commentator of TV3*

***Enric Bañeres**, Journalist of La Vanguardia*

***David Bernabeu**, Journalist of Cuatro and Canal +*

***Santi Nolla**, Editor of El Mundo Deportivo*

***José Manuel Oliván**, Chief of Sports of Radio Marca Barcelona*

***Rogelio Rengel**, Editor of Don Balón*

***Moisés Rodríguez**, Journalist of TVE*

***Joan Vehils**, Editor of Sport*

21h00 END OF SESSION

Wednesday, December 2nd.

09h00 Session 1: ECONOMY AND FOOTBALL
Chairman: Jaime Gil Lafuente (Universitat de Barcelona, Spain)

- ***Commercial Football and the Economic Cycle***
  Stefan Szymanski
  Professor of Economics, City University London, United Kingdom.
- ***Co-Branding as a Leverage for Both Teams and Equipment Makers in their Internationalization: the Case of French Football Clubs***
  Michel Desbordes
  Professor of Sports Marketing, Université Paris Sud-11, France
- ***Can Subsides Help Buy Success? Revenue Sharing in English Football***
  Rob Simmons
  Professor of Economics, Lancaster University, United Kingdom

11h45 Coffee Break

12h15 Session 2: INDECISIONS IN SPORTS IN AN UNCERTAIN ENVIROMENT
Chairman: Sergiy Butenko (Texas A&E University, USA)

- ***Economics of Gambling On Sports – A Multistage Stochastic Programming Approach to American Jai Alai Gambling Strategies***
  Panos Pardalos
  Professor of Industrial Engineering and Systems, University of Florida, USA
- ***The Stadium Game in an Uncertain Environment***
  Daniel Mason
  Professor of the University of Alberta Edmonton, Canada.
- ***A Complex Network Approach to Crisis Recovering in Sport Applications***
  Francesco Carlo Morabito
  Professor of Electrical Engineering, Università Mediterránea di Reggio Calabria, Italia.

14h30 Lunch

16h00 Session 3: MANAGEMENT IN FRONT OF THE CRISIS
Chairman: Anna Maria Gil (Real Academia de Doctores, Spain)

- ***The Impact of the Global Financial Crisis on Sport in North America***
  Brad Humphreys
  Professor of Economics of Gaming, Universidad de Illinois, USA
- ***General Principles for Real Options applied to Professional Football Player Valuation***
  José Luis Sánchez Fernández de Valderrama
  Professor of Financial Economics and Accounting, Universidad Complutense de Madrid, Spain.
- ***Governance and Sporting Success of Top20 Football Clubs after Economic Crisis***
  Domenico Marino
  Físico Nuclear, Università Mediterránea di Reggio Calabria, Italy

18h15 END OF WORKING SESSIONS.

20h30 Bus driving from the REAL ACADEMIA DE LAS CIENCIAS ECONÓMICAS Y FINANCIERAS (Via Laietana, 32) TO THE CÍRCULO ECUESTRE DE BARCELONA

21h00 WELCOMING COCKTAIL & FORMAL DINNER at the "Círculo Ecuestre" (suit and tie obligatory for men)

Thursday, December 3rd

09h30 Session 4: STRATEGES IN SPORTS EVENTS
Chairman: Panos Pardalos (University of Florida, USA)

- ***On Optimal Betting Strategies for Multiple Sporting Eevents***
  Sergiy Butenko
  Professor of Industrial Engineering and Systems, Texas A&E University, USA

- ***Ambush Marketing at Sporting Mega-Events: a Typology of Strategies***
  Simon Chadwick
  Professor in Sports Business Strategies, Business of Sport, Convetry University, United Kingdom.

11h00 Coffee Break

11h30 Session 5: FINANCES AND MANAGEMENT IN FOOTBALL
Chairman: Lorenzo Gascon (Real Academia de Ciencias Económicas y Financieras, Spain)

- ***The Finances of the Top 10 of European Football***
  José Mª Gay de Liébana Saludas
  Professor of Financial Economics and Accounting, Universitat de Barcelona, Spain

- ***How to Detect the Stars of Tomorrow. The case of Football-Dreams***
  Sandro Rosell Feliu
  Ex Vice- president of the FC Barcelona, Spain

13h00 END OF WORKING SESSIONS

13h15 CLOSING ACT OF THE SEMINAR
***Jaime Gil Aluja**, President of the Real Academia de Ciencias Económicas y Financieras*
***Francesc Orriols Bordas**, President of the Federación Catalana de Tenis*
"***La Gestión del Tenis a traves de las Federaciones Territoriales***"

18h00 Bus driving from the REAL ACADEMIA DE LAS CIENCIAS ECONÓMICAS Y FINANCIERAS (Via Laietana, 32) to "COSMOCAIXA"

18h30 VISIT TO "COSMOCAIXA"

Session 1: ECONOMY AND FOOTBALL
Chairman: Jaime Gil Lafuente (Universitat de Barcelona, Spain)

- ***Commercial Football and the Economic Cycle****
  Stefan Szymanski
  Professor of Economics, City University London, United Kingdom.

- ***Co-Branding as a Leverage for Both Teams and Equipment Makers in their Internationalization: the Case of French Football Clubs***
  Michel Desbordes
  Professor of Sports Marketing, Université Paris Sud-11, France

- ***Can Subsides Help Buy Success? Revenue Sharing in English Football***
  Rob Simmons
  Professor of Economics, Lancaster University, United Kingdom

***** You can find this article in the attached annex

Co-Branding as a Leverage for Both Teams and Equipment Makers in their Internationalization: the Case of French Football Clubs

Michel Desbordes (France)

Abstract: In this paper, we analyze how co-branding may act as leverage for both teams and equipment manufacturers in their internationalization endeavours. We study four cases: Paris Saint-Germain and Nike, Olympique de Marseille and Adidas, Olympique Lyonnais and Umbro, and the French national football team and Adidas. We answer four questions: i) What are the gains/benefits for sports teams and equipment manufacturers when they follow a co-branding strategy?; ii) How does co-branding complement or contradict other initiatives sports teams and equipment manufacturers might follow in order to internationalize?; iii) What factors stimulate the internationalization of sports teams and equipment manufacturers when engaging in a co-branding strategy?; and, iv) What are the possible side effects of a co-branding strategy for sports teams and equipment manufacturers in their internationalization activities? We believe that a global brand strategy which refers to a new market and an existing co-brand name would be the most appropriate for sports teams and equipment manufacturers.

Keywords: Co-branding, sports marketing, football team, equipment manufacturer, internationalization.

Introduction

Undoubtedly, branding is considered a strategic asset for companies, including sports organizations in general and sports teams in particular (Mizik and Jacobson, 2008; Quelch, 2007; Richelieu, Lopez and Desbordes, 2008; Stride and Lee, 2007). The rationale is that sports clubs can capitalize on the emotional connection between fans and their team of allegiance (Bauer, Sauer and Schmitt, 2005; Holt, 1995). As previous research has shown, it is not only the fact that branding is cornerstone in sports today (Bauer, Sauer and Schmitt, 2005; Gladden and Milne, 1999; Farrelly, Quester and Greyser, 2005; Mullin, Hardy and Sutton, 2007), but also that sports teams are brands in their own right and should be managed as such (Gladden and Funk, 2001; Mullin, Hardy and Sutton, 2007; Richelieu and Pons, 2006; Ross, 2006).
If not all teams are born equal in terms of brand potential, managers are increasingly looking at strategies to enable their team to reach their full potential, at national and, if possible, international levels (Richelieu, Lopez and Desbordes, 2008). Sports teams generally work hand-in-hand with partners to build their brand: for instance, with sponsors who are looking to initiate a partnership; or with equipment manufacturers who are interested in capitalizing on the brand image and brand appeal of a strong sports team brand, like Nike with FC Barcelona, Manchester United or Inter Milan; or Adidas with Real Madrid, Chelsea or AC Milan. Sponsors and equipment manufacturers are looking at ways of creating synergies with sports teams which could emulate the brands involved (Kwon, Kim and Mondello, 2008).
It is in this context that we dedicate this paper to the analysis of co-branding as leverage for both teams and equipment manufacturers in their internationalization endeavours. In other words, how can teams and equipment manufacturers benefit from their association in order to expand internationally?

By raising this question, we intend to contribute to the literature in sports marketing by exploring:

1) What are the gains of co-branding for sports teams and equipment manufacturers when they follow this strategy?
2) How does co-branding complement or contradict other initiatives sports teams and equipment manufacturers might follow in order to internationalize?
3) What factors stimulate the internationalization of sports teams and equipment manufacturers in following a co-branding strategy?
4) What are the possible side effects of a co-branding strategy for sports teams and equipment manufacturers in their internationalization activities?

With these ideas in mind, we first look at the literature on co-branding. Second, we shall present the methods. Third, we will detail the results and analysis, followed by a conclusion summarizing our findings.

Literature review

By definition, co-branding consists of combining two or more brands in producing, commercializing or promoting a product or service (Kapferer, 2007; Lewi, 2005). Its purpose is to create synergy through the complementary nature of the brands involved, and thus increase market share, revenues and competitivity through customer awareness (Chang, 2009).

There are two types of co-branding: product co-branding and promotional co-branding (Keller, Fleck and Fontaine, 2008). Product co-branding implies that two brands are working together to develop and launch a new product. This new

product can wear both brand names or be introduced under a new name; for example, the Puma Ferrari sneaker and the Smart car (Mercedes and Swatch).

Promotional co-branding occurs when two or more brands combine efforts in a promotional campaign (Lewi, 2005). An example of this is the promotion of New Era caps sported by Will Smith in his video clips, which played at Foot Locker stores worldwide where the caps were sold.

There are three main advantages to co-branding (Keller, Fleck and Fontaine, 2008; Lewi, 2005). First, co-branding enables the respective brands to limit financial risks associated with the development and launch of a new product. This is because the costs associated with research and development and communication and distribution are shared. Second, each brand involved in the co-branding strategy should be able to benefit from the other brand's image and expertise in order to penetrate new markets, and thus improve product image and credibility with another brand association (Chang, 2008). This expands the target market(s), increases revenues and strengthens customer loyalty. Third, co-branding generally increases the number of selling points and, by extension, the opportunities to generate revenue, sometimes beyond the original geographic territory of the brand.

In fact, co-branding should trigger synergy, by capitalizing on the strengths of the brands involved. This synergy helps organizations: enlarge their customer base, increase their profitability, satisfy the needs and wants of customers through new product lines or services, improve their competitive position through higher market share, improve the brand image and facilitate new product introductions, increase customer perceived value, and reduce operating costs (Chang, 2009).

However, co-branding can only work under two conditions. First, the brands must have credibility or perceived expertise in the eyes of the consumers. Second, a functional or symbolic complementarity (fit) between the brands should exist. Without these two elements, there will be no transfer of positive associations from one brand to the other, and vice versa (Chang, 2009).

In order to achieve this, the brands should create a new code or universe in order for the product to differentiate itself on the market and establish its Unique Selling Proposition [USP] (Kapferer, 2007; Lewi, 2005). It is important to develop a meaning that will be easily understood by the consumer and a truly differentiating USP. Otherwise, the benefits of co-branding could be offset by the loss of control of the brand image, the dilution of the brand image or confusion about what the brand really stands for (Keller, Fleck and Fontaine, 2008).

According to Chang (2009), there are four possible co-branding strategies:

1) Market penetration: it combines an existing market and an existing co-brand name (Miller Coors);
2) Brand reinforcement: it implies an existing market and a new co-brand name (Nike Air Jordan);
3) Global brand: it refers to a new market and an existing co-brand name (BenQ-Siemens); and,
4) Brand extension strategy: it happens with a new market and a new co-brand name (Sony Ericsson).

In the sports industry, co-branding between sports teams and equipment manufacturers is starting to garnersome attention. Kwon, Kim and Mondello (2008, p. 170) emphasize that "sport consumers' attitudes toward licensed apparel is partially determined by their attitudes toward a manufacturer." However, the literature remains limited, especially when it comes to analyzing co-branding strategies between a sports team and its equipment manufacturer in international markets. This may sound surprising, considering the opportunities and the financial gains that are at stake. As of 2008,

merchandising exceeded 19 billion USD a year in North America for all teams and all sports combined; this amount was estimated at 7 billion USD for Europe (Price Waterhouse Coopers, 2004, 2007). This is why we shall focus on this issue for our paper, with the following research questions:

1) What are the gains of co-branding for sports teams and equipment manufacturers when they follow this strategy?
2) How does co-branding complement or contradict other initiatives that sports teams and equipment manufacturers might follow in order to internationalize?
3) What factors stimulate the internationalization of sports teams and equipment manufacturers in following a co-branding strategy?
4) What are the possible side effects of a co-branding strategy for sports teams and equipment manufacturers in their internationalization activities?

Methods

We adopted a qualitative approach for this research paper, choosing a case study method, which allowed us to analyze a limited number of organizations within a reasonable timeframe and at a reasonable cost (Yin, 2003). Moreover, case study analyses provide useful results that can be discussed using a theoretical framework (Lee and Lings, 2008). Authors such as Eisenhardt (1989) recommend using between four and ten cases in order to allow for in-depth analysis and relative diversity in order to increase the validity of the results. In this paper, we look at four football teams, selected by convenience, because of accessibility, and their respective equipment manufacturers: Olympique Lyonnais (Umbro), Olympique de Marseille (Adidas), Paris-Saint-Germain (Nike) and the French national football team (Adidas).

We engaged in semi-structured interviews with managers involved with the four teams and their respective equipment manufacturers. The selected managers were directly involved in the organization's marketing initiatives given that the main criterion in the choice of a respondent for a case study was the quality of the information that could be obtained (Kolb, 2008; Lee and Lings, 2008; Patton, 1980). The managers were marketing directors, VPs of marketing, sales managers or presidents of their respective organization. We also interviewed sponsors, university professors and journalists who interact closely with the teams and equipment manufacturers.

Each one-to-one interview was conducted at the headquarters of the respective team and equipment maker in France, or at the sponsor's, university or newspaper office, and lasted 45-90 minutes in the Fall of 2008 and the Winter of 2009. The researchers were accompanied by their research assistants to facilitate collection of data. Between five and eight people were interviewed from each organization, depending on their level of expertise and availability. Interviews were transcribed within 24 hours (Lofland and Lofland 1995). Here are the details of the 26 respondents we met, representing each team-equipment manufacturer combination.

For Paris-Saint-Germain (PSG) and Nike:

- Alain Cayzac, former President of PSG;
- Antoine Théry, Commercial and Merchandising Director of PSG;
- Stéphane Thuillier, Marketing Director of PSG;

- Jean-François Jeanne, Sales Manager, Sportfive[1];
- Daniel Riollo, journalist RMC radio;
- Stéphane Régy, journalist So Foot magazine;
- Jean-Marc Barreaud, Sponsorship Director, Nike.

For Olympique de Marseille (OM) and Adidas:

- Cédric Dufoix, Director of OM Development;
- Lionel Maltèse, Associate Professor at the University of Marseille and consultant for the club;
- Thierry Muratelle, journalist La Provence newspaper, responsible for OM;
- Romain Prigent, person in charge of the communications at Adidas football;
- Vincent Bobin, CRM Manager at OM.

For Olympique Lyonnais (OL) and Umbro:

- Matthieu Malkani-Giraud, Director of International Development at OL;
- Patrick Iliou, General Director of OL;
- Pascal Le Goff, Director of the OL Store at Gerland stadium;
- Laurent Riquier, in charge of relations with OL at Sportfive;
- Thierry Duverdier, General Director of Umbro France;
- Véronique Le Guyader, Marketing and Communication Director of Umbro France;
- Simon Orhand, Football Manager at Umbro France.

For the French national football team and Adidas:

- François Vasseur, Sponsorship Director at SFR[2];
- Pierre Jean Golven, Communication Director at the *Fédération Française de Football* (FFF, French Football Union);
- Florent Soulez, Product Manager « French national team » at the *Fédération Française de Football* (FFF, French Football Union);
- Laurent Riquier, in charge of relations with FFF at Sportfive;
- Vincent Baptiste Closon, Brand Manager football at Adidas;
- Rodlophe Prigent, in charge of relations with the French Football Union at Adidas;
- Alexandre Urvoys, Football Marketing Manager at Nike.

In order to increase the validity of our primary data, we consulted sports publications, team documents, team websites and media articles (print and electronic). Secondary sources provided specific information regarding the organization, as

[1] SPORTFIVE is the world's no.1 football agency and one of the largest sports agencies worldwide. SPORTFIVE handled the exclusive marketing of the European TV rights for the UEFA EURO 2008™ and is responsible for marketing individual TV rights for Italy's Serie A and the rights of Spain's Primera División in Asia. SPORTFIVE has co-operations with more than 30 football associations and over 250 clubs, as well as 10 leagues. SPORTFIVE is also the exclusive agent of MATCH Hospitality in the territory of Continental Europe for the sale of the Official Hospitality Programme for the 2010 FIFA World Cup (www.sportfive.com).

[2] SFR is the second largest mobile company in France. It is part of the Vodafone group. It has been one of the most loyal sponsors of the national French football/football team since 1998.

well as their brand building and brand management with respect to their international endeavours (Yin, 2003). Content analysis was used to give meaning to the responses of the managers, focusing on the organization's internationalization. The qualitative method enabled us to carry out an in-depth case analysis of the managers' strategic visions of co-branding as leverage for teams and equipment manufacturers in their internationalization endeavours.

Results and analysis

Paris-Saint-Germain

PSG is the biggest contract for Nike among French teams; PSG can use the distribution network of Nike, the world's leading equipment manufacturer. Nike can capitalize on the PSG image, which is strong in Paris (a market of 10 million people) and worldwide.

As far as internationalization is concerned, it is clear that PSG uses Nike more than vice versa: the club now has a presence worldwide in Nike stores (Asia, Europe, even in North America). Nike and PSG have a common interest, however, the gains for Nike could be more profitable if the brand would use "the Paris image" (the logo of the club that includes the Eiffel Tower): *"Having the Eiffel Tower on the jersey is unique in the world"* (J.F. Jeanne, Sportfive).

The internationalization of PSG suffers from the club's organization: stability and long-term strategic vision are necessary to leverage the brand (Table 1). The construction of the brand is also dependent on the results on the pitch. Nike has to find a way to promote Paris by selling France abroad through the club. *"Results on the pitch are fundamental for the marketing policy. The particularity of our job is that we do not control anything!"* (S. Thuillier, PSG).

Paris has a strong brand awareness and brand association abroad, on which PSG can capitalize:

"Sportfive organizes the Emirates Cup, where you find at least two clubs sponsored by Emirates (PSG and Arsenal). This allows us to export the PSG brand in England, even though PSG has not played in England for a while. We have just renewed the contract for the next five years with Emirates. The goal is to internationalize and leverage the PSG brand abroad" (J.F. Jeanne, Sportfive).

Undoubtedly, there is strong potential for the PSG brand in co-branding with Nike. However, there is a need to implement this partnership with a real "win-win" outcome between the football club and its equipment manufacturer. Neither PSG nor Nike seems to be activating the partnership.

Table 1

Paris Saint-Germain SWOT analysis

Strengths	**Weaknesses**
PSG is the only club in the most visited capital city in the world. The stadium, the *Parc des Princes*, is almost sold out for every game. The club has important media exposure. The club begins to implement international operations. The club is young (established in 1970) with high potential. The club is popular in France, even though it cannot be compared to OM. The logo of the club includes the Eiffel Tower, an	A lack of results on the pitch for the last five years. Managerial instability. Some conflicts of interest occurred in the last few years. The place of the club in Europe is quite weak. A negative image in peoples' minds in France.

internationally recognized symbol.	
Opportunities	**Threats**
An international sponsor, "Fly Emirates", based in the Persian Gulf. A football academy, where new talents emerge every year. The possibility to optimize the partnership with Nike. The sporting results, which improved in 2009. A development of CRM programs. An international recruitment strategy for players.	The possible birth of a new professional top club in Paris. The end of the contract with Fly Emirates or Nike. The persistence of bad results. The international development of other French clubs (OM, OL).

Olympique de Marseille

Adidas can be satisfied with its relationship with OM at the national level. The club is popular, it can count on millions of fans in France and it represents the opposition to Paris, the arrogant capital city, as seen by most French people. For these reasons, there is not much more to do in France, except opening new Adidas stores[3], which is totally independent of the relationship with OM.

However, there is work that can be done abroad. If internationalization in North Africa has started and is a "natural" expansion considering the socio-demographic landscape of Marseille, it is less interesting than the internationalization in Asia where the market is much more considerable and the consumers are richer:

> *"In fact, OM has three markets to reach: the local one, the European one, and the rest of the world. This implies three different strategies and targets. The local market (Marseille) is ours and does not need any effort*." (C. Dufoix, OM).

> *"We will concentrate on the African market for our international development because we believe our image there is as strong as the English clubs' image in Asia or in the Middle-East, for example."* (C. Dufoix, OM).

> *"Canal+ has announced the launch of a cable TV package in North Africa. OM TV (the club's official TV channel) is included in this package"*. (www.om.net).

Compared to English clubs, the Olympique de Marseille club currently has neither brand awareness nor brand reputation in Asia. Moreover "Marseille" does not mean much to non-football fans. A new stadium might help improve the OM brand, as it could play the role of a modern shrine:

> *"OM does not export itself easily for now. Only 4% of the turnover of its merchandised products comes from abroad. Considering these data, we can say that the OM brand does not really exist abroad"*. (R. Prigent, Adidas)

> *"If OM wants to be an international club, it deserves an international stadium!"* (L. Maltese, University of Marseille)

[3] For now, there are eight Adidas "concept stores" in France where OM has a systematic corner (about 100 sm).

The history of the club is a key factor in its internationalization: the 100th birthday of the club, in 2009, gives credit to the OM brand. In comparison, PSG was established in 1970 and OL rejoined the first French division in 1987.

That being said, the potential for the OM brand and a co-branding strategy does exist. The merchandising policy could be improved because of the popularity of the club in France. However, the club needs more international visibility, and good results on the pitch would help a team that benefits from a strong emotional bond with its fans: *"OM fans spend the most in France for merchandising products" (260 euros per capita)* (*La Lettre du Sport*, March 24, 2006).

The club has not won any titles since the 1993 Champions League victory, which seems far away now. The credibility of the brand is dependent on the team's success. OM will also need internal or "political" stability in order to implement a long-term strategy (Table 2).

OM could benefit from Adidas, considering that the German equipment manufacturer sponsors only a few big clubs in the "top 5 markets" (Real Madrid in Spain, AC Milan in Italy, Bayern Munich in Germany, FC Liverpool and Chelsea FC in England). OM should benefit from Adidas exposure and international distribution channels.

Table 2

Olympique de Marseille SWOT analysis

Strengths	**Weaknesses**
A centennial story (team established in 1899). Marseille is a multicultural city. A passionate interaction between fans and the club. The only French club that has won the Champions League. A city that has a natural expansion through the Mediterranean sea. The opening of a new store in Algeria which was very successful. OM is the absolute first club in the South East of France (30% of the territory) and has millions of fans in France.	A lack of managerial and sporting stability. The stadium is completely unfit, considering the level and the ranking of the club. A lack of sporting results for the last ten years.
Opportunities	**Threats**
The development of the African market. France is a candidate for the Euro 2016 which could be an opportunity to renovate the stadium faster than expected.	The reputation of the club (bribery scandal in 1993) and its presumed links with the criminal world. The competition of other clubs (French and foreigners).

Olympique Lyonnais

As the club has a very thin history despite its recent successes, the leverage of the brand abroad is dependent on the results on the pitch: *"For the last ten years, we can be proud of our performance on the pitch, while being financially profitable at the same time"* (J.M. Aulas, President of OL, www.olweb.fr). Lyon must win a European Cup to bridge this gap; the club still needs credibility at the international level.

However, being a club sponsored by Umbro is a big handicap. The equipment maker has a "very English" image and is particularly strong in its home country where French people and French clubs are not particularly popular. Moreover, Umbro belongs to Nike now and Nike does not seem to have a real strategic vision for Umbro at this point in time.

Being sponsored by Adidas in 2010 might give an acceleration-effect to the club. OL has begun to investigate the Chinese market and is the only French club to do so: their website is translated in English, Chinese and Russian. If the

club can negotiate some dedicated shelf-space in Adidas stores in Asia next year, it will be able to increase its visibility in this crucial strategic market; awareness could trigger the internationalization of the brand (Richelieu, Lopez and Desbordes, 2008): "Our development model consists in building a brand that has international recognition" (M. Malkani-Giraud, OL).

Furthermore, we should not overlook the new stadium, OL Land, a futuristic sports and entertainment project, which would give Lyon a means for its ambitions: *"We will be famous worldwide because our future stadium already belongs among the ten most beautiful stadiums in the world!"* (P. Iliou, OL).

In conclusion, the OL brand still needs to be established outside of France but the co-branding perspectives are promising, especially when Adidas takes over from Umbro in 2010 (Table 3).

Table 3

Olympique Lyonnais SWOT analysis

Strengths	**Weaknesses**
A strong and emblematic president, Jean-Michel Aulas. An impressive sporting performance on the pitch[4]. Positive financial results. An important managerial structure, with a huge marketing department. An international strategy which is specified and clearly planned, which is not the case in other French football clubs.	No European trophy. No club history[5]. No players from Asia, which is the main target for the club abroad. The lack of audience for the French First League abroad. Umbro has a weak commercial network and is only present in football/football.
Opportunities	**Threats**
The future OL Land: a new stadium with an entertainment center. The possibility to export the First French League abroad. Nike bought Umbro[6]; and Adidas will replace Umbro in 2010 as the team's official supplier. The development of football/football academies abroad. The recruitment of players who are famous worldwide. Winning a Champions League.	The club is listed on the stock market. Declining performances on the pitch. The brand OL could be discredited if it is overused, as it tends to be with wine, pizza, hairdressers, driver licence classes, etc. The competition in the market is important and English clubs are ahead of French clubs.

French National Football Team

The French national football team brand is strong abroad, thanks to the team's history: World Champions in 1998 and European Champions in 2000. This performance has created a real market for merchandising products[7]. Adidas has used the team abroad as a key success factor in the implementation of new stores. However, history is behind the team and the new generation is not as popular as the previous one:

> *"The marketing structure of FFF is young, it was only created in 1998 when we became World Champions." (*F. Soulez, FFF).

[4] OL won seven French championships titles in a row from 2002 to 2008.
[5] In the 1980s, the club was in second division. J.M. Aulas (he is still president of the club in 2009) bought it in 1987 and created a company in OL Group. But the club has not the glorious past of Saint-Etienne or Marseille in the French fans' heart. It is a "business" success more than an "emotional" success for some fans.
[6] At the end of the 2009-2010 season the contract between Umbro and OL will end. Adidas will be the new equipment brand of the club. This will increase considerably the possibilities to expand abroad, as Adidas is a much stronger brand than Umbro.
[7] In 1998 and 2000, more than 1 million replica shirts were sold. In a "regular" year, this is about 400,000 (source: Adidas).

> *"It is a passionate relationship between fans and the team. When we win, everybody is ecstatic but as soon as we lose, media and fans are very rude with us and leave no hope for the future! We need to help spectators become fans!"* (P.J. Golven, FFF).

This is one of the major hurdles of a "national team brand" compared to a club brand. In a club, players belong to the teams and they can work together on a daily basis. A national team is fundamentally different: players are selected for their performance, but the national team does not own them, and the work they can do with them is much harder to implement. Sometimes, some players do not want to be ambassadors of the team because their personal equipment manufacturer is different from the national team[8].

One of the constraints of a brand that is constructed through a national team is the "national dimension": a national team is supposed to be popular inside the country and mostly "hated" in the rest of the world. It is particularly hard to transcend this reality. Only a few mythical teams have managed to become appealing worldwide: the New Zealand All Blacks in rugby, Brazil in football, and the US "Dream Team" in basketball.

This will be one of the stakes of the new contract with Nike, starting in 2010. The American equipment manufacturer will have to build this "myth". But at 42 million euros per year, we believe Nike will do its best to reach its goal:

> *"We have no other choice but to develop our brand abroad. The new equipment manufacturer (Nike) will push us and leverage our brand at an international level. This is one of the stakes of this new contract with Nike"* (P.J. Golven, FFF).

> *"Nike will help us develop values and will implement advertising campaigns as they usually do"* (F. Soulez, FFF).

> *"Nike will perhaps bring this "crazy touch" that will Americanize the image of the team with a bit of "show off." Quality, conception and creativity in the collections of Nike products will help the French national team abroad"* (L. Riquier, Sportfive).

For now, the FFF is in a slightly problematic transition stage: it is the end of the contract with its historical equipment manufacturer (Adidas), one year before the World Cup. Adidas tries to sell its French national football team shirts and maximize its investment that is almost over. At the same time, it does not want to prepare the ground and leave a legacy for the next equipment manufacturer, especially not Nike (Table 4).

Table 4

French national football team SWOT analysis

Strengths	**Weaknesses**
Football is the absolute n°1 sport in France, in Europe and in the world. The French national team is the most popular among French teams. The team has a real place in the mythical history of football/football. The team has had an international presence at major events	Bad performances on the pitch since 2007. The image of some players, the opinion of some media about the team and the coach. The allegiance to the brand depends on the results (contrary to the English national football/football team). The national team does not play regularly and games are concentrated (10 games during a World Cup qualifying

[8] Everybody remembers the 1992 image of Michael Jordan hiding a Champion logo with the US flag in the Olympics when he received his gold medal. He did not want to offend Nike, his personal sponsor.

for the last ten years.	campaign, for example, and no games for three months).
Opportunities	**Threats**
Most players from the French national team play in the biggest championships in Europe (Spain – *Liga*, England – *Premier League*, Italy – *Lega Calcio*, Germany – *Bundesliga*). The image of the French national team is still under construction: it has no specific value. The French national team has a huge fan potential outside Paris, but is still underexploited. The new contract with a worldwide equipment manufacturer that has an international strategy: Nike (from 2011 to 2017).	Other championships are more popular. The competition of other national teams. The FFF is not active enough and follows the other strategies of competitors. The Stade de France[9].

Conclusion and discussion

In this paper, we analyzed how co-branding could act as leverage for both teams and equipment manufacturers in their internationalization endeavours. We studied four cases: Paris Saint-Germain and Nike, Olympique de Marseille and Adidas, Olympique Lyonnais and Umbro, and the French national football team and Adidas.

If we look back at our research questions, we will be able to underline the main findings of our paper, along with the managerial and conceptual contributions:

1) What are the gains of co-branding for sports teams and equipment manufacturers when they follow this strategy?

   In the case of football teams, we can definitely say that all three advantages are present: limit financial risks, benefit from each other's brand image and expertise, and increase the number of selling points (Keller, Fleck and Fontaine, 2008; Lewi, 2005). It seems that capitalizing on each other's brand image is key, here. Of course, the teams that we have studied do not enjoy the same brand equity as FC Barcelona or Real Madrid. Hence, we might think that, in general, these teams would benefit more from the brand awareness and reputation of the equipment manufacturer, than vice versa. This could impact the motivation of the equipment manufacturer to piggyback the football team to its full potential abroad. Truly, the brands involved should find a mutual gain in the co-branding strategy; otherwise, the relationship might be neglected somehow (Chang, 2009). Hence, a good performance on the field becomes central in leveraging a sports team brand, with or without the help of the equipment manufacturer (Richelieu and Pons, 2006; Waltner, 2000).

2) How does co-branding complement or contradict other initiatives sports teams and equipment manufacturers might follow in order to internationalize?

   In line with what we just said, the football team and the equipment manufacturer need to be true partners with joint interests, which can be difficult at times.

[9] The Stade de France was built in 1998 for the football World Cup. A private group comprised of three private construction companies (Vinci, Dumez, Bouygues) financed 50% of the facility. In exchange, they now have the possibility to manage the stadium for 15 years : in the contract, they have the insurance that the French national team plays at least six games per year in the arena. The consequence is that there is almost no other possibility for the French national team to play outside Paris. Therefore, it is a handicap for the popularity of the team in the regions.

In our case studies, it seems as if the team and its equipment manufacturer do not have a formal strategy to jointly benefit from their association. That would be very important for a successful collaboration (Kwon, Kim and Mondello, 2008) and for joint internationalization. Currently, the actions appear a little too ad hoc and opportunistic (i.e. Adidas with the French national football team, as the equipment manufacturer's contract ends soon), with some exceptions (i.e. PSG and Emirates Cup). In other words, the commitment does not really perspire yet in the co-branding partnerships that we have studied. In fact, ironically, Nike seems more motivated about its future partnership with the French national football team, which only begins in a few months from now, than about some current partnerships.

3) What factors stimulate the internationalization of sports teams and equipment manufacturers in following a co-branding strategy?

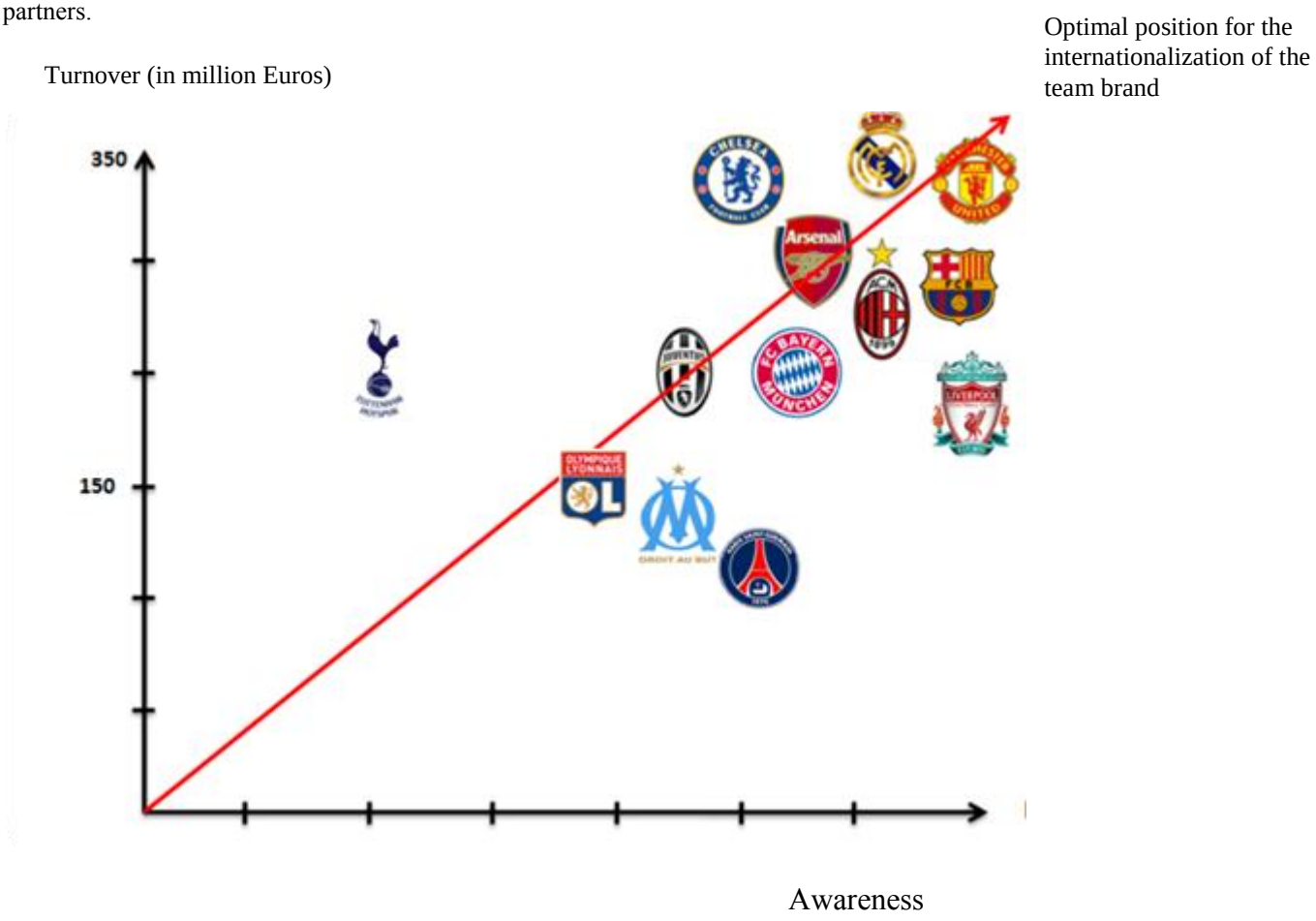
   Based on our study, it seems that team success on the field, the distribution channel of the equipment manufacturer and the intensity of the relationship between the partners, which could depend on the balance of power between them, are potential success factors in the internationalization of clubs and equipment manufacturers.

   That being said, co-branding, as valuable as it is (Chang, 2009; Kapferer, 2007; Keller, Fleck and Fontaine, 2008) cannot replace the lack of brand awareness and brand equity of a sports team, which often depends on a winning record and/or star players (Couvelaere and Richelieu, 2005). Olympique Lyonnais' efforts to penetrate the Chinese market, still unsuccessful, are a good case in point. As pointed out by some managers in previous research, there might also be room for only a few international or global brands in each sport (Richelieu and Pons, 2006). And in this context, French football teams might be at a disadvantage in comparison with other European teams, at least until their performance improves at the continental level (see Figure 1 below).
4) What are the possible side effects of a co-branding strategy for sports teams and equipment manufacturers in their internationalization activities?

   Based on our analysis, we could say that sports teams and equipment manufacturers should not only focus on going international thanks to the help of the other, but also understand how each partner can strategically contribute to their respective internationalization project. As we have noticed with the cases at hand, a formal co-branding strategic plan does not seem to exist between them. This would be the best way to generate synergies between the team and the equipment maker, because there would be a commitment to make the partnership work.

In terms of a co-branding strategy for internationalization, we believe that the global brand strategy, which refers to a new market and an existing co-brand name (i.e. BenQ-Siemens) would be the most appropriate for sports teams and equipment manufacturers (Chang, 2009). This would be especially true when both the equipment maker and the sports team benefit from a strong brand equity, which they could carry into international markets and use to trigger a strong synergy abroad. Also, this would imply a very good distribution channel from the equipment maker, which would provide awareness and prestige to the sports teams at an international level.

As per the limits and future research, admittedly, this is a case study of four teams. Other teams in other sports and other countries should be studied in the next stage of our research. All the more so since we focused on a convenience sample, comprised of only French teams. Furthermore, we should pay special attention to the differences between North America and Europe; indeed, in North America, the league is very much involved and controlling in the international expansion of its teams, brands and merchandising offering; whereas in Europe, teams have much more freedom to expand abroad. These differences should impact international co-branding strategies between clubs or leagues and their different partners.



Source: Deloitte, Football Money League Inquiry, 2008, p. 18.

Figure 1: The optimal position for the internationalisation of a football team brand

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Can Subsides Help Buy Success? Revenue Sharing in English Football

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Abstract

This paper investigates the impact of redistribution of revenues from large successful organizations to small unsuccessful ones. In particular, we ask whether such redistribution actually makes the performance of these organisations closer. Such redistributive mechanisms are common in sports where the motivation is to ensure that competitions are closely run in the sense that the outcomes become hard to predict. In some cases this is achieved through regulation, in others through handicapping, and in the case of English football and many other sports financial redistribution is employed.

We aim to identify the effect of such redistribution by looking at how exogenous variation in financial resources impact on success of the field. This is achieved by exploiting the random assignment of teams to games in the FA Cup knockout competition. We use this random assignment to investigate the extent to which the resulting variation in revenues impact on the performances of clubs in the League competition where all teams play each other (twice) each season.

Keywords: revenue sharing, football, FA Cup, instrumental variables

1. Introduction

In professional sports leagues it is often claimed that a competitive equilibrium might result in too little competitive balance, in the sense that strong teams dominate weak teams 'too much' and more even contests might be more attractive to fans and audiences. Consequently, sports leagues have often adopted forms of revenue-sharing in an attempt to redress perceived lack of competitive balance. The question of effectiveness of revenue sharing in sports leagues has occupied the attention of sports economists since the seminal contribution of Rottenberg (1956). According the invariance proposition, itself an application of the Coase theorem, redistribution of revenues in team sports cannot affect competitive balance in a sports league. For a two team league, with profit maximising clubs, Fort and Quirk (1995) showed that gate revenue sharing displaces the marginal revenue curves of each team with equal shifts so that competitive balance remains unchanged. This conclusion was questioned by Szymanski and Késenne (2004). Using a contest game-theoretic model, in which two players (teams) choose levels of talent so as to maximize profits given the choices of rivals, they obtain the result that, comparing before and after Nash equilibria, gate revenue sharing will worsen competitive balance. The intuition behind this result is that gate revenue sharing reduces the incentives for small teams to invest in player talent, relative to large teams. Small teams gain more from the success of large teams than big teams gain from the success of small teams. Then small teams reduce investment in player talent relative to large teams. Inequality in competitive balance is then exacerbated.

Gate revenue sharing and sharing of broadcast revenues are prevalent in North American sports. In American football, 40% of gate revenues go to the away team. In Major League Baseball, in which the league collects a fixed share of all net local revenues and redistributes these revenues in a progressive manner such that teams with lower revenues receive a greater share of the pool of money that is redistributed (Maxcy, 2009). As Maxcy points out, this arrangement could lead to the unintended and perverse result, as identified by Szymanski and Késenne (2004), that the League subsidy reduces the incentive to win for lower income teams. This implies that such teams are more likely to engage in player trades with better talent moving away from small-revenue teams to large-revenue teams. Maxcy's empirical analysis of player trades in baseball supports this prediction.

In contrast, if teams have the alternative objective of win maximisation subject to a break-even or maximum loss constraint then Késenne (2000, 2007) shows that gate revenue sharing will succeed in improving competitive balance, whether the league consists of just two teams as in Fort and Quirk (1995) or many teams. Hence, theory has the capability to offer predictions that revenue sharing can improve competitive balance, worsen competitive balance or leave competitive balance unaffected. These contrasting predictions turn fundamentally on assumptions surrounding the objectives of teams and on elasticity of talent supply to wage rates.

In European football, there appears to be a general movement away from revenue-sharing. In the English Football League, gate revenue sharing was practised until 1983, when it was formally abandoned (Dobson and Goddard, 2001). Broadcast revenues are shared in European football leagues to some extent, but lower divisions receive low levels of television coverage and there is no mechanism to redistribute revenues from teams in the top division to teams in lower divisions. Over time in English football, club revenues have shown increased dispersion, both between divisions and within divisions (Dobson and Goddard, 2004).

Empirical evidence on the effects of gate revenue sharing on league outcomes is not conclusive. Szymanski (2003) and Borland and Macdonald (2003) note the lack of consensus in attendance demand estimates on impacts of outcome

uncertainty on attendance demand, either at the level of individual matches or in terms of seasonal outcomes. As with the theory of competitive balance, studies can be cited that show positive effects of outcome uncertainty on attendance demand, zero effects and negative effects. Recently, Buraimo and Simmons (2009) have shown for Spanish football that gate attendances respond negatively to increased match outcome uncertainty, as measured by match win probabilities extracted from ex ante betting odds. In contrast, broadcast audiences, measured by viewing figures, respond positively to increased match outcome uncertainty, controlling for quality of the competing teams.

The present paper offers a new perspective on the question of effectiveness of revenue sharing on league outcomes. We examine English football and exploit the random assignment property of the FA Cup knock out competition. In this competition, teams compete against each other with opponents selected by random draw. There is no seeding apart from a stipulation that teams in the top two divisions enter at a later stage than teams in the bottom two divisions. Since the draw is random, lucky teams will meet larger opponents and this offers a revenue-generating opportunity. Revenues from a Cup draw against a large opponent can be recycled into team strength so as to compete more effectively in the League competition.

A paper by Szymanski (2001) also uses data from the English FA Cup and addresses the question of relationship between competitive balance in a league and attendances. Szymanski observed that attendances at FA Cup matches for teams drawn from the same division were less, on average, than attendances at the corresponding League matches between the same pairs of teams. Szymanski interpreted this result as due to increased interdivisional competitive imbalance between league teams. According to Szymanski, the growth of income inequality between divisions has reduced interest in inter-divisional Cup matches while intra-divisional League matches are more interesting to fans than comparable Cup matches.

We pose a very specific question. If revenue sharing helps recipient teams improve their prospects, then teams drawn randomly against large opponents in the FA Cup should generate greater revenues than their divisional rivals who do not benefit from a lucrative Cup draw. If the extra resources from augmented revenues can then be capitalised into improved League performance then we can take this as evidence that revenue sharing does indeed promote competitive balance.

Teams in the bottom two divisions of the English Football League are rarely televised and there is no mechanism to redistribute television broadcast revenues to clubs at this level. The lack of shared gate or broadcast revenues then makes the FA Cup competition particularly important for teams in the bottom two divisions. This is because revenues from progress through the FA Cup are of two types: a prize money component based on the round in the tournament that is reached and sharing of revenues from gate receipts and from broadcasting of Cup fixtures. Unlike the League competition, gate revenues are shared by the competing teams in all Cup matches. Hence, the FA Cup combines the twin features of random (unseeded) draw and gate revenue sharing. Below, we shall empirically estimate the impacts of FA Cup progress through the rounds on team revenues and team performances and pose the fundamental question of whether revenue sharing through the FA Cup competition has beneficial impacts on team revenues and team performances. The impact of the FA Cup random draw will be distinguished in our empirical model from the impact of success (momentum) gained by successful progress through the competition.

The FA Premier League and the Football League together currently comprise 92 teams with 20 in the Premier League and 24 in each of the three Football league Divisions. We shall refer to these divisions as tier 1 (Premier League), tier 2 (currently called Football League Championship), tier 3 (League One) and tier 4 (League Two). Prior to 1992, these divisions would have been referred to simply as Divisions 1 to 4. The FA Premier League was formed in the 1992/93

season, principally in order for top division clubs to capture a larger share of broadcast revenues offered by the new satellite TV company, BSkyB. Mobility of teams between divisions is obtained through promotion and relegation with three teams demoted each season from tiers 1 to 3 and four from tier 3, to be replaced by promoted teams from the tier below. A relatively recent innovation is the playoff competition for the third (or fourth for tier 4) promotion place. Two teams are promoted automatically from tiers 1 and 2, while teams placed third through sixth compete in a knock-out competition to secure one promotion place. This device was intended to raise audience interest at the end of the season, as more games would involve playoff contention. The promotion and relegation system contrasts sharply with the self-contained 'closed' North American league structures (Noll, 2002). As Rosen and Sanderson (2001) succinctly put it, the promotion and relegation system 'punishes failure'. In particular, it punishes failure to invest in team-building.

The remainder of the paper is structured as follows. Section 2 explains the role of the English FA Cup in terms of its impacts on team revenues, effort and performance. Section 3 outlines a model for estimation and explains our data set. Section 4 offers empirical results while section 5 concludes.

2. The FA Cup

The Football Association Cup began in the season 1871/72 with just 15 teams competing. In 2009/2010, a record number of 786 teams took part with qualifying rounds featuring amateur teams beginning in August. As rounds progress, sets of higher status teams are added until the bottom two divisions join the First Round in November, to be followed by teams from the top two divisions in the Third Round in January. This features 64 teams, with 44 from the top two divisions by right. The remaining 20 places are filled by a mixture of lower division and non-league teams. Currently, a tied Cup game leads to a replay at the away team's ground. It the replay is also tied after extra time then the tie is settled by a penalty shoot-out. Occasionally, a small team might cede home advantage to a bigger team so as to capture extra revenue, but this is rarely practised by lower division teams. After four more knock-out rounds, the FA Cup Final is contested at a neutral venue, usually Wembley Stadium, in May. This is a glamorous and prestigious occasion, regarded as a showcase for English football and the Final is broadcast live worldwide.

Recently, media commentators have questioned whether the FA` Cup has lost some of its glamour and appeal. In the 1999/2000 season, Manchester United withdrew its entry to the FA Cup, and competed in a new FIFA international club tournament instead (Dobson and Goddard, 2001). It has been observed that many Premier League clubs field weakened teams, consisting of fringe and reserve players, in earlier rounds of the FA Cup. Their argument is that they need to rest the best players for the Premier League competition. Implicit in this lack of effort to win Cup matches is the economic view that revenues from retention of Premier League status, by avoiding demotion, are much greater than revenues from progress in the FA Cup. Indeed, relegation from the Premier League to the Football League Championship is estimated to cost the unfortunate club around £60m in lost revenue, even though some broadcast revenues are distributed to relegated teams for a two year period following demotion.

In contrast, the opportunity for a small, lower division team presented by a random draw against a high-profile Premier League team is still considerable. Acts of 'giant killing' where low level teams actually beat big teams in the FA Cup are enshrined in history and add to the romantic appeal of the competition. Such exploits are remembered (and replayed on TV) for many decades after they occur. In immediate terms, the random draw against a large club can offer considerable revenue-generating opportunities as the following example illustrates:

Colchester (tier 3) away to Chelsea (tier 1) in season 2005/06, round 5.

Colchester beat two teams from tier 3 to reach round 5. In round 5, Colchester received £400,000 from their share of gate revenue from a crowd of 41,810 at Chelsea- Colchester's ground capacity is 7,000. Broadcast revenue from this game was £265,000. This one game raised £750,000 revenue for Colchester and their total revenues from the Cup competition came to £1m. At the end of the season, Colchester finished 2nd in their division and hence won promotion to the Championship (tier 2). This example shows that lower division teams can benefit both from progress through the rounds of the FA Cup, and also from being randomly drawn against bigger teams. Of course, the lower the divisional status of a team, the smaller is the probability of a team reaching later rounds such as round 5 or beyond. In fact, no division 4 team has reached round 5 since the 1985/86 season. Table 1 shows prize money and potential broadcast revenues by round of FA Cup assessed at the 2006/07 season. The introduction of prize money into the FA Cup revenue streams is quite new (2001/02) and was a response to perceived declining interest by fans in the competition (Szymanski, 2001). A Cup draw matching a lower division team against a Premier League team also has a greater chance of being televised than a fixture between two lower division teams and this offers additional revenue-generating opportunities.

3. Model and data

Szymanski and Smith (1997), Szymanski and Kuypers (1999) and Hall *et al.* (2002) have outlined a simple model that relates team financial resources to team performance. In a panel setting for team *i* in season *t*:

$$Revenue_{it} = f(team\ performance) \quad (1)$$

$$Team\ performance_{it} = g(relative\ wage\ bill_{it}) \quad (2)$$

In this model, *relative wage bill* is the total team payroll for club *i* divided by the divisional average for season *t*. The wage bill is seen as a suitable proxy for team talent. Team performance can be measured as end-of-season league position. In his various papers, Szymanski uses log odds of position defined as $-ln\ (n/(93 - n)$ for the English league as a whole comprising 92 teams across 4 divisions.

In a competitive market, players are paid according to their marginal revenues products and the total payroll of the team squad is simply the sum of wages which is then the sum of marginal revenue products. It is assumed that any externalities in player talents are fully dissipated into player salaries. We should note several problems with the assumptions that lie behind the measure of wage bills as a proxy for team talent resources. First, there is a concern with the available financial data that the payroll figures shown are actually total wages for the whole club, not just the players, and so include commercial, stadium and coaching staff. A further assumption needs to be made that payrolls on non-playing staff are a fixed proportion of payrolls of playing staff, but this cannot be verified. Second, transactions costs and player preferences for location and for matching with particular managers and coaches serve to inhibit arbitrage in the player labour market so differences in pay do not serve to encourage mobility so as to equalise marginal revenue products. Third, the labour market for players in the English leagues was subject to some restrictions in the 1970s, with full freedom of contract only enforced in 1978. Up to that point, clubs could keep a player's registration even if their contracts with players had expired, under the 'retain and transfer' system. The principle of freedom of movement across football leagues within the European Union was only enforceable after the Bosman ruling of 1995. Despite these objections, Simmons and Forrest (2004) found that *relative wage bill* was significantly and positively related to team performance in the top divisions of England, Germany and Italy. In the case of Germany and Italy, the recorded wage bills were actual player payroll figures.

However, Simmons and Forrest did not investigate the problem of causality between payroll and performance. Hall *et al* (2002) performed Granger causality tests for the payroll-performance relationship in English football and found that payroll did indeed Granger-cause team performance.

An alternative model of football team performance was set out by Buraimo, Forrest and Simmons (2007):

League position= f(relative wage bill) (3)

Relative wage bill= g(relative revenue) (4)

Relative revenue= h(market size) (5)

These equations can be combined to give a quasi-reduced form:

League position= f(relative revenue, market size) (6)

In this variation of Szymanski's model, team performance again depends on relative wage bill of teams but this is now endogenous to relative revenues. Team revenues are quickly, and almost fully, transformed into spending on player talent.Indeed, in English football, the correlation coefficient between team revenues and wage bills is observed to be almost one (Buraimo *et al*, 2006). Relative revenues, which are team revenues divided by league or division average in a given season, are determined by market size.

Without a natural experiment, we cannot distinguish between the Szymanski model and the Buraimo model shown above. The payroll-performance equation is not identified. There are actually three problems that lead to lack of identification of the payroll-performance relationship First, the team performance equation may suffer from omitted variable bias in that some other component of team financial or playing resources is not captured by the model. Second, the relative wage bill or relative revenue variables my be subject to measurement error. Finally, team performance and team payrolls or revenues may be simultaneously determined. We shall focus here on the first of these problems and exploit the FA Cup as an additional source of team revenues and playing resources that can help teams augment their playing talent and improve their team strengths and consequent performances. Industry folklore suggests an externality between FA Cup success and League success, as winning Cup games builds team momentum and crowd support that spills over into League performances. If this momentum effect is valid, it should hold independently of team revenue generation so that:

League position= f(relative revenue, market size, FA Cup progress) (7)

But performance spillovers is not the mechanism that we have in mind for FA Cup draws to impact on league positions. Rather, we propose to use various dimensions of FA Cup draws as instruments for team revenues. It is the random draw that creates possibilities for additional revenue generation, and these opportunities can occur independently of the actual outcomes of Cup games, such as a small team beating a big team in what is termed a 'giant-killing' exploit. The random assignment of teams in Cup draws means that extra revenue earned from playing a big team in a given round is itself a source of random variation in team resources. Hence, we use FA Cup draw measures as instruments for endogenous team revenues in order to resolve a potential missing variable problem for our performance-revenue relationship. We can, of

course, test for additional impacts of FA Cup success on League positions through momentum created by FA Cup performance but these effects occur for a given amount of revenue.

Hence our model will be

League position= f(relative revenue, FA Cup success, team fixed effects) (8)

where league position is simply the end-of-season divisional ranking with 1 for first, 2 for second and so on;

Relative revenue = g(FA Cup draw, team fixed effects, lagged relative revenue) (9)

In this adaptation of the model of Buraimo *et al* (2007) we subsume market size under team fixed effects. FA Cup draws will be captured by three variables. We take rounds 3 to 5 and create dummy variables for participation in each of these rounds. Round 3 is where teams from the top two divisions first enter the competition by right. It is very rare for teams from the bottom two divisions to progress beyond round 5. Round itself is clearly not exogenous since achieving any particular round depends on team performance. However, *Round*home* denotes round reached interacted with a home draw. Since *home* is determined by random drawn and there is a well-known home advantage that therefore affects the probability of winning that Cup tie, irrespective of opponent identity and status.

*Round*opponent size* captures the predicted gain in revenue from meeting a particular opponent. *Opponent size* is measured by stadium capacity and not League (or Cup) attendance. Attendances could well be endogenous to Cup progress and success while ground capacity is pre-determined before League and Cup competitions develop and can be taken as exogenous. We note the reconstruction of most English football stadia following the Taylor Report of 1989. Following the Hillsborough stadium disaster of April 1989 in which 96 fans lost their lives due to crowd congestion and crushing at an FA Cup semi-final at Sheffield Wednesday's ground, clubs were instructed by Government to refit their stadia to all-seater specifications. This led to smaller stadium capacity figures, but increased gate revenues, for most clubs. We made every effort to locate accurate stadium capacity figures especially during the refitting of stadia in the early 1990s, using *Rothmans Football Yearbook* and a thorough online search for club histories. Finally, we combine *round* reached with a dummy variable for opponent from the top division, *round*top team*, to capture the boost to revenues from meeting a big team. Typically, clubs in the top division bring higher revenues to Cup games than teams from lower divisions.

Hence, our full model is:

League position= f(relative revenue, FA Cup success, team fixed effects) (10)

*Relative revenue = g(**Round*home**, **Round*opponent size**, **Round*top team**, lagged relative revenue, team fixed effects)* (11)

The use of round interaction terms means that the impact of an instrument is switched on according to the round reached. This model is estimated by instrumental variables with team fixed effects at each stage. The FA Cup draw variables serve as instruments and we test for under-identification, weakness of instruments, and for over-identification. We estimate the model separately by division and then as a pooled regression combining divisions. We then contrast an OLS league

position fixed effects model with the IV version to check that the impacts of revenue on team performance are different when we allow for FA Cup draw effects on revenues. If the FA Cup draw is irrelevant to team revenues and team performances then the revenue effects on performance should be similar in both OLS and IV models. If the FA Cup draw adds to relative revenues for those teams that encounter big teams then we predict that this boost to revenues will enhance team performances to a greater extent than if FA Cup revenues are excluded.

Our data on team revenues come from Szymanski and Kuypers (1999), Stefan Szymanski and various issues of the Deloitte Annual Review of Football Finance. These data are taken from company accounts. Our sample begins at 1971/72 and ends in 2007/08 for the top two divisions but the best coverage for all divisions in from 1991/92 to 2000/01 with incomplete reporting for all divisions before 1991 and no records at all for the bottom two divisions after 2001. The fourth tier of the League is particular patchy in coverage with just three to six teams per season offering revenue data in the 1970s. Empirical results from the fourth tier must then be treated with caution. However, t-tests of mean finish positions for divisions 3 and 4, comparing teams with reported revenues and those without fail to reject the null hypothesis of equality of positions. This gives us some encouragement to persist with the relative revenue measure even where coverage is thin.

Details of FA Cup performance, including identity of opponents, round played and results, were extracted from www.soccerbase.com. Stadium capacity figures were obtained from editions of *Rothmans Football Yearbook* and cross-checked against online records of club histories, with particular attention given to the stadium reconstruction period of the early 1990s.

4. Empirical results

Table 2 shows mean revenues, both as totals and relative to divisional averages, for the four divisions according to progress through the FA Cup. We show three categories of revenue: by highest round of FA Cup achieved, whether or not teams play top division opponents in a particular round and whether or not teams defeat top division opponents in a particular round.

In broad terms, it appears that teams that progress to round 5 or beat top division teams generate higher relative revenues than teams who exit the FA Cup at round 3 or earlier. For divisions 1 and 2, either playing or beating a top division opponent in round 5 is associated with greater total and relative revenue associated with being eliminated at the earliest opportunity in round 3. In the bottom two divisions, either playing or beating a top division opponent in round 4 is associated with greater total and relative revenue associated with being eliminated before round 3. It is also notable that teams from the bottom two divisions that actually reach round 3 have higher revenues, on average, than teams that exit prior to this stage. However, the reported revenues in each FA Cup category do not increase monotonically by round.

We begin our regression analysis in Table 3 with a fixed effects OLS model of team finishing positions, estimated separately by division, with relative revenues as the sole exogenous regressor. The impact of relative revenue on League position is highest in the bottom division and greatest in the top division. Hence, a given increment in relative revenue is accompanied by greater returns in terms of League performance in the bottom tier. This appears to be plausible as the bottom tier contains a set of relatively small, somewhat homogeneous clubs, all with limited access to revenues. In this lowest division, a modest increase in relative revenues can deliver a substantial gain in League position. In the top tier, revenues are more highly dispersed than at the bottom. The standard deviation of relative revenue in the top tier is 0.65

compared to 0.42 for the lowest division. It is also apparent that the dispersion of relative revenues in the top division, has increased over time from a standard deviation of 0.48 before 1992, at which point it became restructured as the FA Premier League, to 0.76 under the new branding. This supports the finding of increasing dispersion of revenues stated by Dobson and Goddard (2004). In the post-1992 Premier League a given increase in relative revenue is associated with a smaller impact on League position.

Next, we add FA Cup momemtum effects to the OLS League position model. Momentum is captured by a set of dummy variables, *FA Cup progress*, defined as round reached interacted with victory over a top division team: *Beat top team*round3* through to round 5. The bottom division is excluded from this model since the number of cases where a team from this division defeated a team from the top division was two for round 3 and just one for round 4. For the top division, we see that defeating a same-division rival in round 5 is associated with a modest bur significant improvement in League position of 1.2 places, controlling for unobserved team fixed effects. In division 2, we see no significant effect at all from defeating top divison teams on League position. In division 3, we find a substantial, significant effect on League position from beating a top division team in round 4, with a 4.4 place improvement.

However, the performance-revenue relationships shown in the OLS estimates seen in Table 3 are not identified. Table 4 shows estimates of a two stage least squares model, pooled across divisions, in which FA Cup draw covariates are instruments. It is clear that when these instruments are included alongside relative revenue in an augmented OLS fixed effects model then not one of these instruments has a significant coefficient. Hence, a favourable draw against a top tier opponent, cannot be taken, in itself, to have a 'momentum' effect on League performance by raising confidence and 'form' of teams. The FA Cup can have an impact on League performance through revenue-generation and the dissipation of revenues into team strength. This can be achieved by retention of players who might otherwise leave or by hiring new players to reinforce team resources.

Table 4 shows estimates of our two-stage least squares model, pooled across divisions. The results do not give much support for the application of FA Cup variables as instruments. Few of the instruments have significant coefficients. In the case of division 2, none of the instruments returns a significant coefficient.

Nevertheless, there are some signs that FA Cup performance in some divisions does have an impact on League success. In the top tier, we see that meeting a rival top division team in round 3 adds significantly to relative revenue. However, this is offset by the negative effect of capacity of the opponent. For top division capacity levels of around 30,000, which corresponds to an average ground size over the sample period for this level, the gain to revenue from meeting a top team is wiped out by the fact that a sizeable opponent is confronted. This suggests that our capacity instrument actually conflates size of opponent with probability of winning. A big team with higher ground capacity is harder to beat. Moreover, if this big team comes from one's own division and wins the Cup tie then that rival advances to later rounds to accumulate more revenue from gates, broadcast viewing and prize money. Meanwhile, the defeated team is forced to 'concentrate on the League' to use the industry cliché but with fewer relative resources.

For the third division, it appears that playing a top division team in round 5 adds significantly to relative revenue. This impact is reduced as capacity of top division opponent is increased, but never enough in the sample to eliminate the positive effect entirely. A division 3-division 1 match in round 5 is not a frequent event and only occurs 18 times over a 30 year period in our sample i.e. once every two seasons. But when it does happen a tier three team benefits from extra revenue streams. Of course, top division teams are on average more likely to progress to round 5 than lower division

teams. Hence, conditional on reaching round 5, the probability of being drawn against a top team is quite high (0.64 in our sample).

The diagnostic test for underidentification rejects the null while the Hansen J overidentification test does not reject the null that the model is identified. However, the Kleibergen-Paap LM test reveals a problem of weak identification. This is not surprising as several of the instrumental variables have insignificant coefficients.

The impacts of relative revenue on team League performance are shown in Table 4 for the unrestricted case of relative revenue coefficient inequality. The coefficients are higher than in the OLS fixed effects case but are closer together in magnitude. F-tests suggest coefficient equality for divisions 1 to 3, but not 4, and so we proceed to restrict the model to impose equal impacts of relative revenue on performance across the top 3 divisions. The constrained coefficient on relative revenue in the league position equation is -6.339 with a t-statistic of 11.96. With the coefficient equality restriction imposed, the null hypothesis of weak identification is rejected, according to the Kleibergen-Paap critical values for their test, applied to a test statistic of 19. Also, the test for underidentification again rejects the null while the Hansen J test fails to reject the null of identification at 5 per cent (*p* value of 0.06).

5. Discussion and conclusions

Overall, our results show a larger impact of relative revenue on team league performance when revenues are endogenous to FA Cup performance. At first glance, this is not consistent with omitted variable bias apparent in estimates of wage equations, for example, where number of years of education is an imperfect proxy for worker ability. In that case, the impact of the endogenous regressor on the dependent variable is biased upwards in OLS, and instrumentation lowers the coefficient. Here, the coefficient rises once we introduce our set of FA Cup instruments. The apparent paradox can be resolved by thinking of the performance-revenue relationship as a long-run equilibrium relationship that is subject to shocks from unforeseen FA Cup performance. When these shocks are accounted for, League performance is raised above the normal level for a given set of inputs. The failure of our most general model to pass the weak identification test does, however, suggest caution in making inferences. Nevertheless, all instrumental variable specification tests pass when the lowest division is excluded.

We found some evidence of a momentum effect of FA Cup success on team league positions, given revenue, especially for division 3. Impacts of FA Cup draws on revenue are entirely absent for division 2. For teams at this level, the FA Cup appears orthogonal to their objectives which appear either to gain promoted to the top tier or to retain divisional status. Neither a favourable FA Cup draw nor a successful Cup run help Division 2 teams to make progress in the League. For division 3 teams, we do observe some impacts of FA Cup draws and momentum on League success. In particular, meeting a moderately sized top division team, with 25,000 ground capacity, in round 5 generates a positive impact on League position of 2.3 places. Beating a top division opponent in rounds 3 or 4 is predicted to generate an improvement in League position for a division 3 team of 3.2 and 4.4 places, *cet. par.*

The limited success of our FA Cup draw instruments in explaining variation in team revenues suggests that revenue-sharing in the FA Cup does not have a great deal of impact on League performance. For division 2 teams, several of which are aspiring to prize of a large revenue bonus (estimated by industry experts at around £60m), the FA Cup is simply irrelevant. If revenue-sharing were to be abandoned in the FA Cup then teams in the bottom two divisions would lose some of the opportunity to enhance their revenues and improve their League performance. At present, the FA Cup

combines elements of prize money and revenue-sharing and both of these serve as important incentives for teams in the third tier of English football. In the bottom fourth tier, the prospect of a home draw in the third round, after many divisional rivals have been eliminated, gives a revenue advantage over competitors from the same division.

We lack revenue data for teams in the bottom two divisions after 2001. Since then, English football has adopted the 'transfer window' practice by which teams can only trade players with permanent contracts within a season during the month of January. Before 2001, the deadline for player transfers in a given season was at the end of March. The current transfer window serves to restrict trades and, in particular, means that teams that make progress in the FA Cup cannot convert the extra revenues into player acquisitions financed by transfer fees selling clubs. We predict, therefore, that any beneficial effects of FA Cup draws on revenues and hence League performance would be reduced as this restriction on player trades comes into place.

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Table 1 Revenues per club in FA Cup 2006/07

Round	Prize	TV income
3	40,000	150,000
4	60,000	150,000
5	120,000	265.000
6	300,000	265,000
Semi final	900,000	
Final	1,000,000	

Revenues from ticket sales of a particular Cup match, net of VAT and eligible costs, are divided as: 45% per team (home and away) 10% to a central pool for later distribution to football associations and clubs.

Table 2 Team revenues by division and FA Cup round, £m

Division 1	Round 1 or 2	Round 3	Round 4	Round 5
Round reached		19.80	23.10	34.20
		(0.835)	(0.901)	(1.168)
Play top division team		16.50	26.20	34.20
		(0.850)	(0.949)	(1.230)
Beat top division team		30.50	46.10	37.40
		(1.238)	(1.217)	(1.359)
Division 2				
Round reached		4.96	6.78	6.33
		(0.921)	(1.064)	(1.109)
Play top division team		5.41	6.36	6.19
		(0.931)	(1.1.06)	(1.081)
Beat top division team		7.10	7.03	8.07
		(1.160)	(1.238)	(1.308)
Division 3				
Round reached	1.43	1.86	1.44	1.91
	(0.937)	(1.068)	(0.999)	(1.206)
Play top division team		2.20	1.37	2.10
		(1.134)	(0.998)	(1.309)
Beat top division team		1.74	2.09	
		(1.036)	(1.166)	
Division 4				
Round reached	0.82	1.15	1.24	
	(0.930)	(1.096	(1.385)	
Play top division team		1.44	1.23	
		(1.119)	(1.490)	

Note: relative revenues, scaled by divisional averages for a given season, are shown in parentheses. *Round reached* denotes the highest round achieved i.e. no further progress beyond the specified round.

Table 3 Impacts of relative revenues on League position

	Division 1	Division 2	Division 3	Division 4
OLS fixed effects only	-3.136 (2.70)	-5.177 (6.42)	-5.416 (5.24)	-7.978 (3.21)
OLS fixed effects plus Cup win effects	-2.995 (2.78)	-5.269 (6.71)	-5.067 (5.09)	

*Beat top team*round 3*	-1.033 (1.80)	-0.303 (0.32)	-1.420 (1.17)
*Beat top team*round 4*	0.023 (0.04)	0.337 (0.33)	-4.398 (5.84)
*Beat top team*round 5*	-1.207 (3.08)	1.839 (1.34)	-0.517 (0.17)

Note: Absolute *t* statistics in parentheses.

Table 4 Pooled estimates of a 2SLS model of league positions by division

	Division 1 1971/72 to 2007/08	**Division 2 1971/72 to 2007/08**	**Division 3 1971/72 to 2000/01**	**Division 4 1971/72 to 2000/01**
Relative revenue 1st stage				
Round 3 home	-0.008 (0.25)	-0.053 (1.53)	-0.025 (0.47)	**0.143 (2.20)**
Round 4 home	0.073 (1.84)	-0.009 (0.20)	-0.033 (0.45)	0.162 (1.42)
Round 5 home	0.150 (1.84)	-0.053 (1.12)	0.218 (1.48)	
Round 3 opponent capacity	**-0.003 (2.03)**	0.001 (0.56)	-0.001 (0.75)	-0.002 (0.34)
Round 4 opponent capacity	0.001 (0.58)	0.002 (1.09)	**0.001 (1.96)**	0.003 (1.56)
Round 5 opponent capacity	-0.002 (1.03)	0.002 (0.67)	**-0.011 (2.29)**	
Round 3 top opponent	**0.108 (1.96)**	-0.020 (0.40)	**0.204 (2.01)**	0.090 (0.81)
Round 4 top opponent	-0.029 (0.50)	0.039 (0.57)	-0.140 (1.22)	0.404 (1.84)
Round 5 top opponent	0.057 (1.13)	-0.034 (0.34)	**0.627 (3.15)**	
Lagged relative revenue	0.332 (2.68)	0.041 (1.40)	0.056 (2.41)	0.062 (2.26)
League position 2nd stage				
Relative revenue (IV)	-4.889 (5.37)	-5.178 (8.74)	-6.072 (10.58)	-8.354 (13.26)
*Beat top team*round 3*	-0.976 (1.74)	-0.502 (0.56)	**-3.169 (2.45)**	3.078 (1.25)
*Beat top team*round 4*	0.348 (0.57)	0.600 (0.61)	**-4.393 (2.09)**	
*Beat top team*round 5*	-0.832 (1.39)	0.637 (0.48)		

Notes: N= 1739, Kleibergen-Paap LM test for underidentification = 127.7 (p = 0.000), Kleibergen-Paap Wald F test for weak identification = 2.86, Hansen J test for overidentification = 47.87 (p = 0.09).

12h15 Session 2: INDECISIONS IN SPORTS IN AN UNCERTAIN ENVIROMENT
Chairman: Sergiy Butenko (Texas A&E University, USA)

- ***Economics of Gambling On Sports – A Multistage Stochastic Programming Approach to American Jai Alai Gambling Strategies***
  Panos Pardalos
  Professor of Industrial Engineering and Systems, University of Florida, USA

- ***The Stadium Game in an Uncertain Environment***
  Daniel Mason
  Professor of the University of Alberta Edmonton, Canada.

- ***A Complex Network Approach to Crisis Recovering in Sport Applications***
  Francesco Carlo Morabito
  Professor of Electrical Engineering, Università Mediterránea di Reggio Calabria, Italia.

Economics of Gambling On Sports – A Multistage Stochastic Programming Approach to American Jai Alai Gambling Strategies

Qipeng P. Zheng, Yingyan Lou, Panos Pardalos (USA)

Abstract

With the increased gambling tolerance, the economic stake of gambling on sports is growing bigger than ever before. One common type is the para mutual gambling, where the gamblers bet on the results of games, such as Jai Alai, dog racing or horse racing. Uncertainties lie both in the game itself and in the bets made by all gamblers. This study attempts to develop the optimum betting strategies for Jai Alai game based on the rules, the historical results and the random return of each game. Two main concerns of this study are: modeling the randomness in both the game and the player sides, and formulating multistage stochastic mixed-integer models for the strategy-making problem to maximize the return and controlling the risk as well.

Keywords: Economics, Sports, *Jai Alai, Arbitrage, Strategy, Sequential Investing, Dynamic Programming, Multistage Stochastic Integer Programming*

1. Introduction

Since the 1970s, sports have become more economically important than ever before. Gambling on sports is also flourishing due to the increased tolerance on gambling worldwide, and helps make the economic stake of sports even bigger (Andreff and Szymański (2006)). The impact of gambling is even more vital to some specific sports, such as Jai Alai, horse and dog racing, etc. For example, in United States these sports would not even exist in those states where gambling is prohibited. On the other hand, in order to organize and manage sports more efficiently and increase its importance, operations research has been widely applied in sports managements (Butenko et al. (2004)). Due to the advances of optimization techniques, sports management's models have been becoming more realistic and useful than ever. This study focuses on modeling and finding para mutual gambling strategies that can accommodate the trade-off between profit and risk based on a multistage stochastic programming approach. As a typical para mutual gambling game, betting strategies for Jai Alai are studied. This sport game was developed in Spain Basque area three centuries ago. Similar to the racket ball, this game is played between two opposing teams in an enclosed rectangular fronton. The players alternatively catch the ball and throw it to the front wall by using a big basket tied on one hand. There are two types of games: single and double, in which each team has one or two players respectively. In United States, there are usually eight teams in a Jai Alai game. All teams are arranged in a queue and each time the first two teams in the queue play against each other. The winner wins point(s) and goes to the top of the queue, and the loser goes to the end without gaining any point. The rank of the eight teams is determined at the end of each game. Bets can only be placed before the game and the payoffs are calculated based on the wagering poll. Given the initial sequence of the eight teams in the queue and the payoffs, the betting strategies are investigated.

There are many ways to wager, and a good betting strategy should take into account the uncertainties lying in both the game results and the payoffs. On one hand, the results of Jai Alai games were widely studied in the literature. Goodfriend (1975) analyzed the results using Monte Carlo simulation. The winning probability of each team was examined by Moser (1982) using a tree formulation. Skiena (1988) further discussed the impact of limiting point on the results. More recently, Markov Chain analysis was applied to simulate the Jai Alai results by Byrne and Hesse (1996). On the other hand, the randomness in the payoffs is still not very clear. This is because that there is not enough data to compute the real expected return due to the large number of betting combinations and the fact that the composition of gamblers varies from time to time. Limited research has been done on Jai Alai strategies. Lane and Ziemba (2004) studied the Jai Alai arbitrage strategies. They developed the perfect arbitrage conditions for the Mexican Jai Alai game. However, the Mexican gambling rules differ a lot from what are used in United States, thus their problem setting is quite different than the one studied in this paper.

In this study, the determination of a betting strategy is modeled as a multi-stage planning problem which considers uncertainties coming from both the game itself and the gamblers. Randomness in the game results is replicated using Monte Carlo simulation and the payoffs are assumed to follow a simple distribution. These data are described in Section 2. Multistage stochastic betting strategy problems with different objectives are formulated in Section 3. Two other simple strategies are studied as well. Numerical examples and comparison between different strategies are provided in Section 4 with discussion on risk arbitrage conditions. In Section 5 the concluding remarks follow.

2. Modeling Randomness in the Game

2.1 Game Results Simulation

We use Monte Carlo simulation to calculate the probability of each scenario. Similar to Skiena (2001), we put eight teams in a queue and simulate the game between the top two teams. Instead of simulating the players' detail actions (which is difficult to do and is not the main point here), the result of a particular game is calculated by applying a Bernoulli trial based on the winning probability (obtained from Jai Alai websites) of each team. Simulation of the game between the top two teams is repeated sequentially until a winner team (rank 1) can be determined. To find out the second and third place teams, playoff rules are then introduced. The playoff simulation is similar to the previous one only that a queue with the remaining seven teams is used instead. The playoff rules are made by law. Details can be found in Skiena (2001). To sum up, the simulation procedure is as follows:

Step 1: If top team's points are higher than the limiting points, go to step 3. Otherwise, go to step 2.

Step 2: Use Bernoulli trial to determine the winner and the loser for the game between the first two teams. Winner gets two more points if all eight teams have played at least once, and gets one more otherwise. Winner goes to the top of the queue and loser goes to the end of the queue. All other teams move up by one position. Go to step 1.

Step 3: Playoff.

2.2 Payoffs

Payoffs will be affected by individual bets through their contribution to the wager pool. This type of interaction is very difficult to model explicitly. To simplify the problem, we assume the payoffs are random variables independent to the gambler's betting decisions. This assumption can only be justified when the gambler's wager is small enough to be neglected compared to the whole wager pool. Therefore, the maximum amount of bet each gambler can place should be restricted. Under this condition, the payoffs are further assumed to follow a two-point distribution with probability 0.5. That is to say, there are two equally probable realizations of the payoffs, under which the payoffs for any bet b are 1.1 and 0.9 times of the average payoff respectively. This is an over-simplified assumption. However, if a realistic payoff distribution was to be modeled, the number of possible final scenarios would grow exponentially with the size of the finite sample drawn to approximate the actual distribution. For modeling purpose, we accept the above simple assumption. Denote the payoff for a particular bet b by $payoff(b, t, sp)$ where t denotes the stage and $sp \in \{1,2\}$ denotes the payoff realization scenario. The average payoff data is obtained from Skiena (2001). The return of a bet under each game result scenario can then be calculated based on $payoff(b, t, sp)$. The format of the data should be adjusted for different formulations. This will be explained in more details in Section 3.

3. Determination of Betting Strategies

3.1 Scenario-Based Multistage Stochastic Betting Strategy

Consider two ways of wagering.

- PLACE – Gambler wagers that a team or player will finish first or second.
- QUINIELA – Gambler picks two teams to finish first and second in **any** order.

We first consider the tree representation of the problem.

Figure 2 illustrates the tree structure of the problem. The nodes denoted by a circle are decision nodes where major betting decisions are made. Arcs in the tree represent the possible realizations of the game results and payoff scenarios. Total returns of betting on the *T* Jai Alai games are calculated at the leaf level square nodes. Note that as we are only interested in the combination of top two ranked teams without any exact order information, we only need to consider $\binom{8}{2} = 28$ possible game results. For each game result realization, there are two possible payoffs. Hence, the total number of arcs for each decision node is 56. The number of nodes thus grows exponentially with a base of 56 at each stage. More specifically, there are 56^{t-1} decision nodes at stage t and 56^T leaf nodes at the end of the gambling game.

Alternatively, the full horizon scenarios can be considered directly without specifying the history of the process. This way, nonanticipativity constraints (Birge and Louveaux, 1997) are needed to link related scenarios. Figure 3 presents the full-horizon representation of the problem. As in

Figure 2, circle nodes are decision nodes and square nodes are leaf nodes. In this representation, the total number of decision nodes is expanded to $T56^T$ instead of $(56^T - 1)/55$ in the previous one. The solid vertical lines give an idea of the linkage between related scenarios, those who share common previous states. The full-horizon representation actually expands all the decision nodes in the tree representation, and the nonanticipativity constraints serve as the linkage to group them back.

3.1.1 Decision Variables

As discussed above, the bets placed by the gambler may affect the payoffs. To minimize this effect, we assume the gambler can only place at most one bet on each different combinations. Corresponding to "place" and "quiniela" betting rules, two groups of major decision variables are introduced. For $i, j = 1,2, \dots ,8$:

- x_i, binary variable denoting whether to place bet on player *i* for "place" game.
- x_{ij}, binary variable denoting whether to place bet on players at positions *i,j* for "quiniela" game. Here the order does not matter. Therefore, this group has 28 variables in all.

These 36 binary decision variables consist of the decision vector denote as $x(b)$ at each decision node. Auxiliary variables y and z are introduced at each leaf node to measure the total win and loss.

For tree representation, major decision variables can be expressed as $x(b,t,k_t)$, where k_t is the index of the decision nodes at stage *t*. For full-horizon representation, major decision variables are $x(b,t,s)$ where *s* denotes a full scenario. Since the number of the leaf nodes is the same as the number of total scenarios, we denote the auxiliary variables as $y(s)$ and $z(s)$ in both representations.

3.1.2 Constraints

The constraints for this problem are relatively simple. The most important one is that at each decision node, the total bets placed by the gambler cannot exceed the money available to him at that node. Another constraint is needed to calculate the net profit at the leaf nodes. For full-horizon representation, a set of nonanticipativity constraints is further introduced. Other constraints include non-negativity of all the decision variables and that the major decision variable x should be binary.

3.1.3 Betting Strategies

After the above discussion on decision variables and constraints, the problem is now ready to be formulated as a mathematical program. Two different objectives, maximizing the expected profit and minimizing the weighted sum of expected loss and conditional value-at-risk (CVaR), are studied in this section.

3.1.3.1 Profit maximization

The most straight forward objective is to maximize the expected return. Under the tree representation, the problem can be formulated as:

EP-T

$$\max_{x,y,z} \quad Z = \sum_{s} prob(s)(y(s) - z(s)) \tag{1}$$

$$\text{s.t.} \quad I(t,k_t) = \sum_{b=1}^{36} p(b)x(b,t,k_t) \qquad t = 1,2,3,...T,\ \forall k_t \in K_t \tag{2}$$

$$R(t,k_t) = \sum_{b=1}^{36}\sum_{sr=1}^{56} r(b,t-1,sr)x(b,t-1,l_{k_t}) \qquad t = 2,3,...T,\ \forall k_t \in K_t \tag{3}$$

$$w(1,k_1) = M \tag{4}$$

$$w(t,k_t) = R(t-1,k_t) + w(t-1,l_{k_t}) - I(t-1,l_{k_t}) \qquad t = 2,3,...T,\ \forall k_t \in K_t \tag{5}$$

$$w(T+1,s) = \sum_{b=1}^{36}\sum_{sr=1}^{56} r(b,T,sr)x(b,T,l_s) + w(T,l_s) - I(T,l_s) \qquad \forall s \in S \tag{6}$$

$$w(T+1,s) - M - y(s) + z(s) = 0 \qquad \forall s \in S \tag{7}$$

$$I(t,k_t) \le w(t,k_t) \qquad t = 1,2,3,...T,\ \forall k_t \in K_t \tag{8}$$

$$y(s),\ z(s) \text{ non-negative} \qquad \forall s \in S \tag{9}$$

$$x(b,t,k_t) \text{ binary} \qquad \forall t, \forall b,\ \forall k_t \in K_t \tag{10}$$

In the EP-T model, $p(b)$ is the ticket price of a bet *b*; K_t is the set of decision nodes at stage *t*; $r(b,t,sr)$ is calculated through the payoff data, representing the return under game result/payoff scenario *sr* for a bet *b* made at stage *t*; l_q denotes the farther node of node *q* in the tree and M is the initial amount of money; $w(t,k_t)$ denotes how much money we have at the beginning of game *t*. Constraints (2) and (3) define the investment, i.e., cash outflow, and the total return at each decision node respectively; constraint (4) – (6) calculate/define the total available money for each node (both

decision and leaf nodes); constraint (7) then computes the total win and loss for each leaf node; finally constraint (8) restricts the investment at each decision node to be no more than the available money at that node. If the total available money is zero or less than the minimum ticket price, then the gambler will quit the game. Note that $w(t,k_t)$ and $w(T+1,s)$ are always non-negative, as there is no penalty to the wrong bets, one can only lose to the maximum all the money he has in the worst case.

Alternatively, under the full-horizon representation, the problem can be modelled as:

EP-F

$$\max_{x,y,z} \quad Z = \sum_s prob(s)(y(s) - z(s)) \tag{11}$$

$$\text{s.t.} \quad I(t,s) = \sum_{b=1}^{36} p(b)x(b,t,s) \qquad t = 1,2,3,...T \ \forall s \in S \tag{12}$$

$$R(t,s) = \sum_{b=1}^{36} r(b,t,s)x(b,t,s) \qquad t = 1,2,3,...T \ \forall s \in S \tag{13}$$

$$w(t,s) = R(t-1,s) + w(t-1,s) - I(t-1,s) \qquad t = 2,3,...T+1 \ \forall s \in S \tag{14}$$

$$w(T+1,s) - M - y(s) + z(s) = 0 \qquad \forall s \in S \tag{15}$$

$$w(1,s) = M \qquad \forall s \in S \tag{16}$$

$$I(t,s) \le w(t,s) \qquad t = 1,2,3,...T \ \forall s \in S \tag{17}$$

$$\sum_{s' \in S^t_{J(s,t)}} prob(s')x(b,t,s') - \sum_{s' \in S^t_{J(s,t)}} prob(s')x(b,t,s) = 0 \qquad \begin{matrix} b = 1,2,...,36 \\ t = 1,2,3,...T \ \forall s \in S \end{matrix} \tag{18}$$

(9)-(10)

Constrains (12)-(17) are the same as in EP-F, only that they are defined for each node in the full-horizon representation (see Figure 3). Note that $r(b,t,s)$ is not the same parameter as $r(b,t,sr)$, though they both represent the returns. The expanded parameter $r(b,t,s)$ is computed by correctly assigning $r(b,t,sr)$ to each full-horizon scenario. Equation (18) is the nonanticipativity constraint, where $S^t_{J(s,t)}$ denotes the set of scenarios that share the common history of *s*. This constraint enforces the knowledge of future outcomes to be excluded when the decision at current stage is made.

Although the full-horizon representation is relatively simple in terms of modeling effort, it has a major drawback: the space and time complexity of solving the problem increases exponentially. This is because the expansion of all the decision nodes in the tree representation increases both the number of decision variables and the number of constraints. The nonanticipativity condition further adds $B \times T \times |S|$ constraints, where *B* is the total number of decision variables at each node. Therefore, it requires a lot memory to store the coefficient matrices. More importantly, as a mixed-integer program, the computational time and the memory required by the Branch-and-Bound (e.g., Floudas 1995) procedure grow exponentially with the size of the problem. As demonstrated later in the paper, standard solvers are not able to handle this formulation due to the lack of the memory.

3.1.3.2 Optimization using CVaR

Besides the expected profit, a gambler may also concern about the average loss in high consequence scenarios. Rockafellar and Uryasev (2000) proposed a linear programming formulation to calculate value-at-risk (VaR) and optimize CVaR simultaneously. This is done by introducing a free variable ζ and non-negative variables $\eta(s)$ for each leaf node. Intuitively, $\eta(s)$ measures the loss exceeding a certain value ζ, and the sum of the expected excess loss and ζ provides a measure of the average loss in high consequence scenarios. Following this idea, the betting strategy considering both the expected profit and the average excess losses can be formulated based on the tree representation as:

CVaR-T

$$\min_{x,y,z,\zeta,\eta} \quad Z = \zeta + (1-\beta)^{-1}\sum_{s} prob(s)\eta(s) - \lambda\sum_{S} prob(s)\big(y(s)-z(s)\big) \qquad (19)$$

(2) – (10)

$$\eta(s) \geq z(s) - y(s) - \zeta \qquad \forall s \in S \qquad (20)$$

$$\eta(s) \geq 0 \qquad \forall s \in S \qquad (21)$$

Since there is generally a trade-off between expected profits and the risks (represented here by CVaR), λ in equation (19) is a weighting factor representing the gambler's attitude toward risk. The smaller the λ is, the more risk-adverse the gambler is. β is the percentage parameter. Note that because gamblers are more concerned with losses, it is the right tail of $z(s) - y(s)$ distribution that we should model.

3.2 Dynamic Programming Formulation and Optimal Policies

Since the introduction of dynamic programming by Bellman in 1952, it has become a very important modeling and solution tool for a great variety of operations research problems. Many dynamic approaches to solve sports management's problems have been proposed and conducted as well, such as Sackrowitz (2004). Dynamic programming is a very useful tool to solve multistage deterministic/stochastic problems (Bertsekas (1987)). Because the results of each stage are independent of each other but payoffs and winning probabilities are different, using multistage dynamic programming can both capture the dynamics across all the stages and reduce the size of the problem since there is no need to formulate all the outcomes if the future cost/benefit function can be modeled appropriately. If the dimensionality explosion can be handled properly, we can include all possible decisions, e.g., all types of bets, instead of just PLACE and QUINIELA. Let $x_{k,l}^{t}$ denote the amount of bets placed on combination l for the bet of type k at stage t. It is an integer variable, since in most of Jai Alai places the bets are discrete. For example, the minimum bet is one dollar for any of your favorite combination. Let first relax this constraint and make every decision variable a continuous variable. Suppose we only want to maximize the ultimate value, i.e., the money you will have after the last game. So there will be no intermediate objective function. The multistage dynamic programming formulation of the profit maximization problem at stage t ($t < T$) for scenario j of stage $t-1$ is as follows,

DP_t:

$B_{t-1}\left(x^{t-1}, w^{t-1}, \xi_j^{t-1}\right)$

$$
\begin{aligned}
= \quad & \max_{x,w} \quad B_t(x^t, w^t) \\
& \text{s.t.} \quad w^t + \sum_{k\in K}\sum_{l\in L_k} x_l^t = w^{t-1} + \sum_{k\in K}\sum_{l\in L_k} R_{j,l}^{t-1} x_l^{t-1} \\
& \qquad x_l^t \geq 0, \qquad\qquad \forall\, l \in L_k, k \in K, \\
& \qquad w^t \geq 0,
\end{aligned}
$$

where $P_{s,l}^t$is the probability of scenario s when combination l wins at stage t; $R_{s,l}^t$ is the corresponding return; w^t is the money we do not bet at stage t; $B_t(x^t, w^t)$ is the future benefit function which is defined as follows,

$$B_t(x^t, w^t) = \sum_{j\in S} P_j^t B_t(x^t, w^t, \xi_j^t).$$

The last stage problem, DP_T, which does not have a future benefit function, is shown as follows,

DP_T:

$B_{T-1}\left(x^{T-1}, w^{T-1}, \xi_j^{T-1}\right)$

$$
\begin{aligned}
= \quad & \max_{x,w} \quad w^T + \sum_{k\in K}\sum_{l\in L_k}\sum_{s\in S} P_{s,l}^T R_{s,l}^T x_l^T \\
& \text{s.t.} \quad w^T + \sum_{k\in K}\sum_{l\in L_k} x_l^T = w^{T-1} + \sum_{k\in K}\sum_{l\in L_k} R_{j,l}^{T-1} x_l^{T-1} \\
& \qquad x_l^t \geq 0, \qquad\qquad \forall\, l \in L_k, k \in K \\
& \qquad w^t \geq 0,
\end{aligned}
$$

The solution of problem DP_T is not hard to find,

$$B_{T-1}\left(x^{T-1}, w^{T-1}, \xi_j^{T-1}\right) = \begin{cases} PR_{\max}^T (R_{j,l}^{T-1} x_l^{T-1} + w^{T-1}), & PR_{\max}^T > 1 \\ R_{j,l}^{T-1} x_l^{T-1} + w^{T-1}, & o/w \end{cases}$$

where $PR_{\max}^T = \max\{P_{s,l}^T R_{s,l}^T | s \in S, l \in L_k, k \in K\}$.

Let $ER_{\max}^T = \max(PR_{\max}^T, 1)$, and then we can write the objective function of stage $T-1$ as follows,

$$B_{T-1}(x^{T-1}, w^{T-1}) = ER_{\max}^T \left(w^{T-1} + \sum_{k\in K}\sum_{l\in L_k}\sum_{s\in S} P_{s,l}^{T-1} R_{s,l}^{T-1} x_l^{T-1} \right).$$

So the stage $T-1$ problem becomes the same as in stage T, since $ER_{\max}^T$ is a constant in stage $T-1$. The best policy is still to choose the combination with the highest ER_{max}^{T-1}. So do all the previous stages. Hence for a relaxed problem, the optimal policy for stage t is to choose the combination with the highest $ER_{\max}^t$, and then bet all your money on this combination if $ER_{\max}^t > 1$ and do not wager otherwise.

This policy in long run is the best, but it may be very dangerous in short run, since the series of games will never repeat and the formulation does not include any risk constraint. In order to control risk, we can add CVaR constraints in the above dynamic formulation since they are linear constraints and easy to handle. Suppose we would like to control the risk for each stage, which means that we include CVaR constraints to control the loss of each stage. The formulation is as follows,

$DP - CVaR_T$:

$B_{T-1}\left(x^{T-1}, w^{T-1}, \xi_j^{T-1}\right)$

$$
= \quad \max_{x,w} \quad w^T + \sum_{k\in K}\sum_{l\in L_k}\sum_{s\in S} P_{s,l}^T R_{s,l}^T x_l^T
$$

$$\text{s.t.} \quad w^T + \sum_{k\in K}\sum_{l\in L_k} x_l^T = w^{T-1} + \sum_{k\in K}\sum_{l\in L_k} R_{j,l}^{T-1} x_l^{T-1},$$

$$\sum_{k\in K}\sum_{l\in L_k}\sum_{s\in S} x_l^T - \sum_{k\in K}\sum_{l\in L_k} R_{j,l}^T x_l^T \le \eta + y_j^T, \qquad \forall\, j \in S,$$

$$\eta + \sum_{j\in S} \frac{P_j^T y_j^T}{1-\alpha} \le \psi,$$

$$y_j^T \ge 0, \qquad \forall\, j \in S,$$

$$x_l^t \ge 0, \qquad \forall\, l \in L_k, k \in K,$$

$$w^t \ge 0.$$

It is not that obvious to find the solution of this sub problem because of the risk constraints. But it is still easy to find a sub optimal solution, the one which has the highest expected return, $ER_{\max}^t$, great than 1 and whose conditional value at risk is lower than ψ.

3.3 Other Betting Strategies

3.3.1 Proportion-based formulation

One possible simple strategy is that we only bet a certain percent, α, of the money we have at each stage on the combination with the maximal expected net gain. With this strategy, the betting decision (which combination to bet on) is predetermined. Therefore, the result scenarios of the game can be simplified to two: whether this combination wins or not. Figure 4 is a demonstration for a simple two-stage game. Assume the winning probability of the combination a gambler bet on is p_t for stage t, and the average return is R_t. At each node (t, K_t), denote the available money on hand by $m_{t,k}$, and $p_{t,k}$, the probability this node can be reached. Then, for each node in the simplified scenario tree, the available money and the probabilities can be calculated. Thus, maximizing the expected return with respect to α in a T stage problem is formulated as:

PB

$$\max_{\alpha,m} \quad Z = \sum_{j=1}^{2^T} p_{T,j} m_{T,j} \tag{22}$$

$$\text{s.t.} \quad p_{i,j} p_{i+1} = p_{(i+1),(2j-1)} \qquad j = 1,\cdots,2^i; i = 0,\cdots,T-1 \tag{23}$$

$$p_{i,j}(1-p_{i+1}) = p_{(i+1),2j} \qquad j = 1,\cdots,2^i; i = 0,\cdots,T-1 \tag{24}$$

$$(1-\alpha)m_{i,j} + \alpha m_{i,j} R_i = m_{(i+1),(2j-1)} \qquad j = 1,\cdots,2^i; i = 0,\cdots,T-1 \tag{25}$$

$$(1-\alpha)m_{i,j} = m_{(i+1),2j} \qquad j = 1,\cdots,2^i; i = 0,\cdots,T-1 \tag{26}$$

$$m_{0,1} = M \tag{27}$$

$$0 \le \alpha \le 1 \tag{28}$$

$$m_{i,j} \ge 0 \qquad j = 1,\cdots,2^i; i = 0,\cdots,T-1 \tag{29}$$

However, this may not be a good strategy for the Jai Alai case, since the returns are greatly affected by the distribution of wagers made by the gamblers. If a gambler always wagers a certain proportion of his available money, the assumption that the payoffs are independent to the gambler's decision may not be valid anymore. Suppose the money bet on this combination by all the gamblers is n, and the empirical average return per dollar (without the influence of the gambler's bet) is R. If a gambler bets m dollars on this combination and he wins, then the real average return per dollar, $R^*(m)$, is computed as $R^*(m) = Rn/(m+n)$. This is a decreasing function when m is nonnegative. Since the wager pool for one particular combination is not very large, $R^*(m)$ is always no greater than R and sensitive to m. Because n is hard to be observed (not released by the Jai Alai frontons), it is difficult to predict the real average return in the objective function.

3.3.2 Simple arbitrage strategy

Suppose that all Jai Alai games are independent of each other, and our bets do not affect the returns. It is not difficult to perceive the arbitrage strategy: place bets on the team/combination k, which satisfies the following property, $p_k \times R_k > m_k$, where p_k is the winning probability, R_k is the average return, and m_k is the money we bet on this combination. This strategy is used in Skiena (2001). In the long run (infinite stages), this strategy leads to no loss of money. This observation is pretty rough and sensitive to the assumptions made.

4. Numerical Example

For demonstration, we consider a toy problem with only two stages. A gambler initially has ten dollars can place bets in either "place" or "quiniela" games. Eight players are simulated for each Jai Alai game to obtain the winning probabilities.
Table 1 reports the simulated probability of a combination *i,j* appearing both in the first two places for the two games. Average payoff data (Skiena, 2001) for "place" and "quiniela" games are summarized in Table 2 and Table 3 respectively. Tickets prices are all two dollars. The models are implemented in the algebraic modeling system GAMS (Brooke *et al*, 1992) and the commercially available solver CPLEX is used to solve the formulated mixed-integer programs.

We first solve the expected profit maximization problem. For the EP-F formulation, an "out of memory" error is thrown and GAMS is not able to generate the model with 1888MB memory. For the EP-T formulation, the model is solved within several minutes. The optimum objective value is 16.45 and the detailed betting strategy is reported in Table 4. According to the solution, the gambler should bet on more risky "quiniela" combinations in the first stage, and the more conservative "place" combinations in the second stage. The solution to the CVaR-T model with $\beta = 0.9$ and $\lambda = 0.65$ is summarized in Table 5. Similar relative risk-taking level is observed as before only that the overall risk level is reduced. With this strategy, the expected return is 5.55, less than that of the EP-T model; but the 90%-CVaR is 2 (while that of EP-T solution is 10), indicating the gambler will lose only two dollars on an average in the 10% highest loss scenarios. By adjusting the value of λ, the relationship between the risk measure and the expected return under the optimal solution to CVaR-T models is plotted in Figure 5. This observation confirms the trade-off between the two performance measures.

The PB model is solved as well with the same numerical settings. The proportion based strategy only bets on the combination with the maximal expected net gain. For the first game, the combination is quiniela (1,5) with expected net

gain of 2.61 per dollar, and quiniela (1,4) with expected net gain of 0.28 per dollar is the one to bet on for the second game. The problem becomes,

$$\max\{M(0.74\alpha^2 + 2.89\alpha + 1) \mid 0 \le \alpha \le 1\}$$

The optimal objective value is 4.63M with $\alpha^*=1$. Whether this net gain is greater than the stochastic formulation solution depends on M. If M is big, the strategy leads to a larger expected profit. However, since not many people bet on "quiniela" game in practice (small value of n), this solution is usually an over estimate of the actual situation. If M is small, the expected profit will be lower than the stochastic optimization solution.

As for the simple arbitrage strategy, consider the same two stage problem. Since the $p_k \times R_k > m_k$ condition holds for $k = 6,7,8$ at the first stage, rather than the strategy provided by the stochastic program, a gambler will make some bets on "place" if this strategy is adopted. Given $m_k = 1$, the optimal expected profit using this strategy is only 6.01, less than that of the stochastic solution.

5. Concluding Remarks

In this study, betting strategy problems for the Jai Alai game are formulated as mixed-integer scenario-based multistage stochastic programs. Different methods to maximize the expected net gain or to control the risk are investigated. Two other straightforward strategies, the proportion-based and the simple arbitrage ones, are studied as bench marks to the stochastic formulation. In our numerical experiments, the stochastic multistage planning formulation outperforms the others in terms of the expected net gain. However, there is no guarantee on the arbitrage property of the strategies obtained from the stochastic program. Future research will focus on the conditions under which there exists a better arbitrage strategy than the simple one in Skiena (2001). The computational issue is interesting problem in the future, since the model will grow exponentially if all possible wagering combinations and more stages are considered. Furthermore, how to handle the sub problem of $DP - CVaR_t$ to get an appropriate future benefit function is another problem of interest.

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Table 1 Winning Probabilities for the Two Games

Player Combination	Winning Probability	
	Game1	Game2
1,2	0.10348	0.06257
1,3	0.10618	0.06343
1,4	0.01220	0.05701
1,5	0.15607	0.04696
1,6	0.03913	0.03993
1,7	0.04196	0.03430
1,8	0.02933	0.03453
2,3	0.06986	0.06321
2,4	0.00793	0.05756
2,5	0.10861	0.04735
2,6	0.02687	0.04017
2,7	0.02667	0.03407
2,8	0.01777	0.03451
3,4	0.00453	0.03796
3,5	0.09345	0.03601
3,6	0.02137	0.03520
3,7	0.02562	0.03344
3,8	0.01794	0.03744

4,5	0.01391	0.02183
4,6	0.00392	0.02468
4,7	0.00446	0.02832
4,8	0.00261	0.03328
5,6	0.01626	0.01351
5,7	0.02148	0.01940
5,8	0.01712	0.02610
6,7	0.00487	0.01130
6,8	0.00428	0.01665
7,8	0.00217	0.00930

Table 2 Place Payoffs for the Two Games

Player	Payoffs	
	Game1	Game2
1	$5.91	$6.17
2	$5.80	$6.01
3	$6.54	$6.76
4	$7.06	$7.77
5	$7.51	$7.49
6	$8.51	$8.71
7	$8.25	$8.35
8	$8.61	$8.89

Table 3 Quiniela Payoffs for the Two Games

Player Combination	Payoffs	
	Game1	Game2
1,2	$47.21	$37.55
1,3	$39.99	$40.33
1,4	$41.08	$45.05
1,5	$46.25	$38.44
1,6	$51.70	$45.77
1,7	$50.56	$46.23
1,8	$55.07	$57.22
2,3	$35.85	$35.96
2,4	$39.64	$34.11
2,5	$44.41	$36.39
2,6	$61.83	$45.45
2,7	$44.17	$45.49
2,8	$57.06	$53.31
3,4	$51.46	$49.30
3,5	$43.35	$50.13
3,6	$54.32	$47.52
3,7	$48.38	$58.13
3,8	$47.23	$58.21
4,5	$66.51	$65.65
4,6	$62.83	$61.02
4,7	$46.99	$49.13
4,8	$61.85	$53.89
5,6	$84.20	$97.31
5,7	$55.56	$52.81
5,8	$65.37	$56.55
6,7	$88.73	$96.83
6,8	$71.07	$70.37

7,8	$90.40	$82.51

Table 4 Results for EP-T Model

Player Combination	Decision Node (*t,s*) 1,1	2,1	2,2	2,3	2,4	2,7	2,8	2,19	2,20	2,29	2,30
1		1	1	1	1	1	1	1	1	1	1
2		1	1	1	1	1	1	1	1	1	1
3		1	1	1	1	1	1	1	1	1	1
4		1	1	1	1	1	1	1	1	1	1
1,2	1	1	1	1	1	1	1	1	1	1	1
1,3	1	1	1	1	1	1	1	1	1	1	1
1,4		1	1	1	1	1	1	1	1	1	1
1,5	1										
2,3		1	1	1	1	1	1	1	1	1	1
2,5	1										
3,5	1										
3,8		1	1	1	1	1	1	1	1	1	1

Table 5 Results for CVaR-T Model with $\beta = 0.9$ and $\lambda = 0.65$

Player Combination	Decision Node (*t,s*) 1,1	2,1	2,2	2,7	2,8
1		1	1	1	1
2		1	1	1	1
3		1	1	1	1
4		1	1	1	1
1,2	1	1	1	1	1
1,3		1	1	1	1
1,4		1	1	1	1
1,5	1				
2,3		1	1	1	1
3,8		1	1	1	1

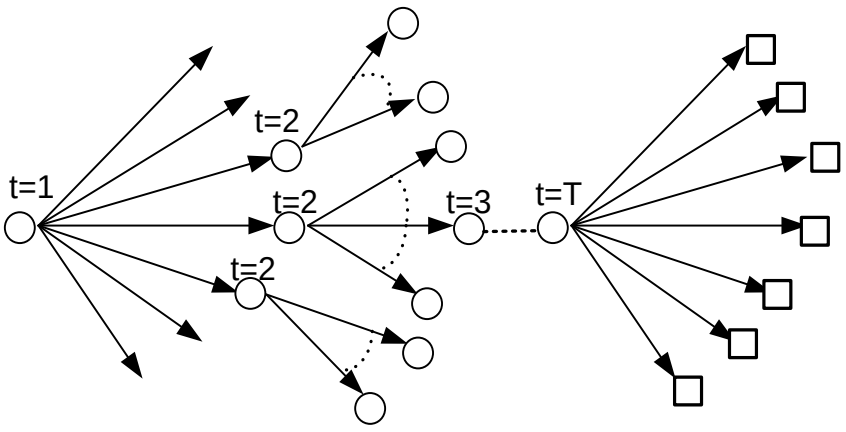

Figure 2 Tree Representation

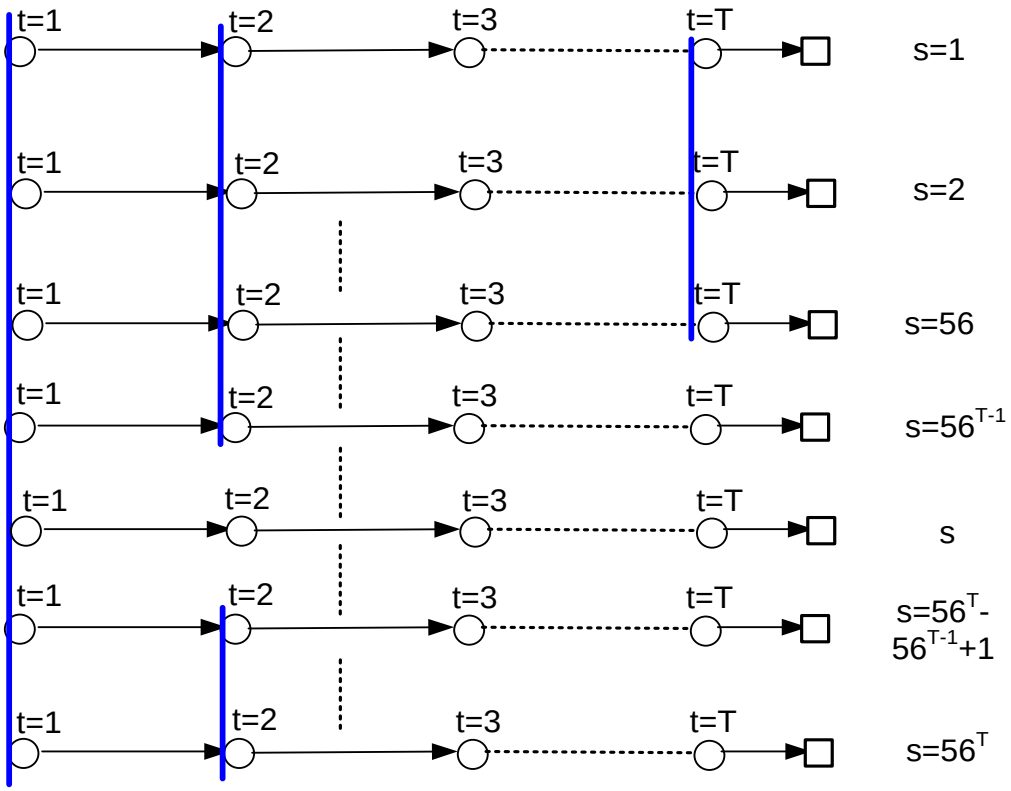

Figure 3 Full Horizon Representation

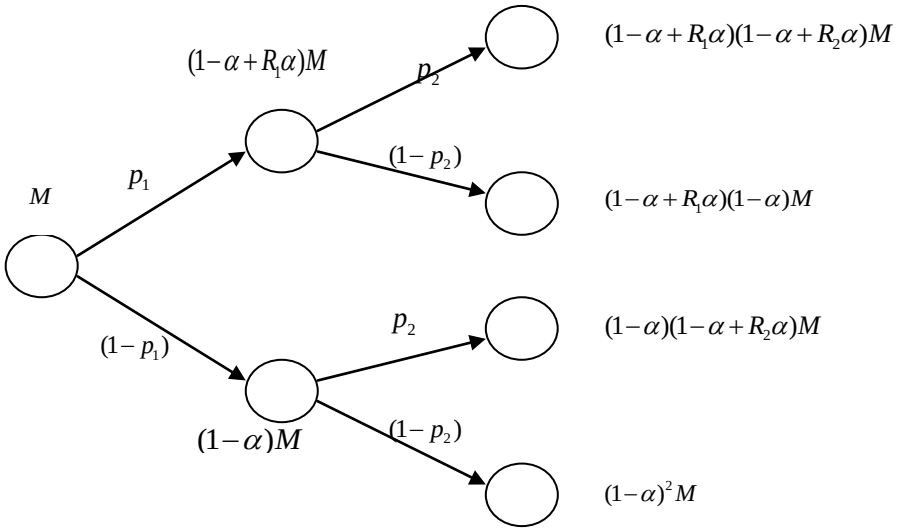

Figure 4 Tree Representation of the Proportion-Based Formulation

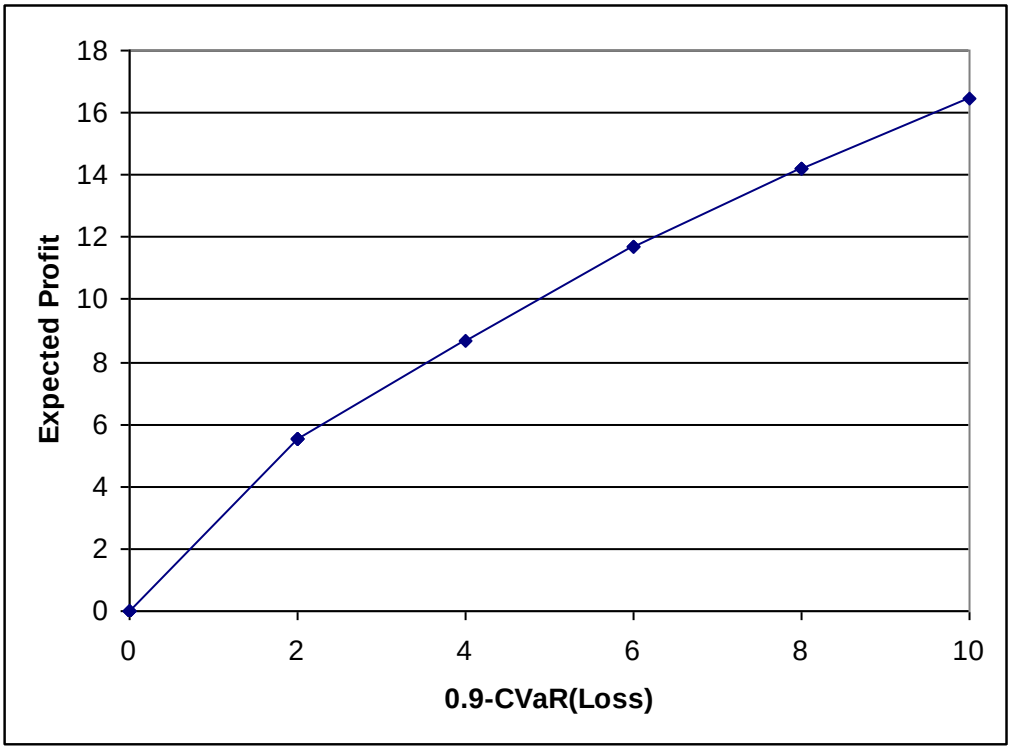

Figure 5 Trade-Off between Expected Profit and Risk Measure

The Stadium Game in an Uncertain Environment

Daniel S. Mason (Canada)

One unique characteristic of North American major league sports franchises relates to their mobility – they are businesses that can and do uproot and seek out better opportunities elsewhere where local communities fail to support them. However, due to the unique treatment of sports franchises by US antitrust law – which allows leagues to artificially limit the number of available franchises – these same sports franchises have also developed a means to leverage the presence of a local team to exact significant subsidies from their host communities; thus, rather than moving from financially untenable situations, teams may move from good financial situations to great ones, all at the expense of local taxpayers.

There are several reasons why cities continue to engage in the "stadium game." The first relates to the competitiveness of cities. Due to the changing global economy, cities now compete on a much broader scale for flows of capital, and many have been forced to reinvent themselves in the context of a movement away from traditional industries – such as manufacturing and distribution – toward a more service based economy (Sassen, 2002). Thus, as human capital becomes more mobile, cities try to present themselves as attractive places to visit, work, and invest in. To do so, significant public resources have been invested in convention centres, the construction of downtown "tourism bubbles", and the development of amenities that contribute to tourism and quality of life benefits (Spirou & Bennet, 2003).

Within this competition, stadiums and arenas, built as anchors of broader urban development (read revitalization) projects have become a flashpoint of debate among taxpayers and scholars alike (Danielson, 1997; Euchner, 1993; Rosentraub, 1997a; Shropshire, 1995). This is because the attachment that citizens have with their local sports teams, combined with restraints on the number of available franchises, has resulted in these developments becoming the most substantively funded pieces of the urban development puzzle, from a taxpayer perspective. And like other pro-growth development projects, there are a litany of usual suspects who stand to benefit from sports facility development.

Academic research has examined the stadium game from a number of different lenses. The first relates directly to the financial benefits that teams generate for their host communities. Perhaps in response to over-inflated economic impact studies put forth by facility proponents, a small group of academics began exploring the economic benefits of teams. This body of research has generally debunked the myth that sports arenas and their member franchises act as engines of economic activity within communities and, where measurable, economic impacts have even proved to be negative (cf. Baade & Dye, 1988; 1990; Baim, 1994; Coates & Humphreys, 2000; 2003; Colclough, Daellenbach, & Sherony, 1994; Fainstein & Stokes, 1990; Hudson, 1999; Humphreys, 2001; Rosentraub, 1997a; 1997b; Saidel, 2000; Zipp, 1996).

Another stream of research has been lead by economists seeking to measure the intangible benefits that teams have. These studies have attempted to ascertain the public goods value of teams as a way of evaluating the effectiveness of public subsidies. While this research has confirmed that there are indeed significant public goods associated with local sports franchises, they do not justify the size of subsidies that teams have received (cf. Johnson, Groothuis, & Whitehead, 2001; Johnson, Mondello, & Whitehead, 2007; Santo, 2008).

With this in mind, other scholars have sought to examine just how cities come to make the decision to subsidize teams, borrowing from urban affairs and political economic approaches. Thus, a focus is on the decision making apparatus and how facility proponents are able to get their way in providing the subsidy (Friedman & Mason, 2004; 2005). Further,

other scholars have examined the role that the media play in shaping public opinion, in light of the fact that the media are not disinterested parties in regard to the issue (Delaney & Eckstein, 2008). Buist and Mason (in press) examined how the local newspaper framed coverage of two separate proposals to build sports facilities in Cleveland, Ohio; one that failed in 1984, and another that passed in 1990. They found that several distinct frames were embedded in discourse surround coverage in the Cleveland *Plain Dealer*. As the discussion above would suggest, it is critical to better understand exactly how discourses surrounding facility development in communities emerge, as these provide the messages that shape public opinion. Clearly more empirical research is required to examine this issue in practice. The following extends this work by examining media discourse in a Canadian city considering the construction of an arena in its downtown core. The paper is organized as follows. First, an overview of the stadium game in North America is provided, followed by a description of the context in Edmonton, Alberta. Following a review of the method, the media frames emerging from the newspaper analysis are discussed.

An Overview of the Stadium Game

As mentioned above, decisions to fund sports facilities are ultimately rooted in the rivalries amongst cities competing in globalizing economies for tourists, jobs, and investment (Euchner, 1993; Harvey, 1989; Kotler, Haider, & Rein, 1993; Waitt, 1999). Sports facilities are viewed as particularly useful in cities where there is a transformation from traditional industries to more service-based economies (Laws, Scott, & Parfitt, 2002; Whitelegg, 2000), and where destinations are developed in urban areas for local and visitor consumption (Hannigan, 1998). The perception of increasing competition amongst cities has also created a sense of urgency for some communities (Altshuler & Luberoff, 2003), igniting a stadium and arena construction boom that has occurred in larger urban centres in North America, where 72 new facilities alone opened between 1990 and 2005. Costs have also increased dramatically – facilities that cost an average of US$51 million (in 2001 dollars) in the 1950s now exceed US$300 million (Altshuler & Luberoff, 2003). In addition, cities have chosen to use sports facilities as part of downtown redevelopment –79 percent of the new facilities built between 1990 and 2001 were situated in or very close to downtown, in contrast to 39 percent during the previous three decades (Altshuler & Luberoff, 2003). In sum, 80 per cent of the professional sports facilities in the United States have been replaced or undergone major renovation since 1987, at a total cost of more than US$19 billion, with the public providing US$13.6 billion (71 per cent), of that amount (Baade, 2003). Cities have traditionally paid for facilities using infrastructure and operating subsidies (Howard & Crompton, 2004), through general obligation and revenue bonds paid off using future stadium revenues, or hotel, admission, or sales taxes (Petersen, 2001).

In a study of minor league baseball stadiums, Johnson (2000) identified three objectives communities have in financing facilities. First, stadiums can be used to advance redevelopment activities, such as anchoring downtown development. Thus, in return for funding the sports facility and providing a favourable lease agreement, cities expect certain positive economic benefits, including direct (visitor spending), indirect (ripple effects of recirculating dollars), and induced (further ripple effects of employees spending wages, etc.) effects (Howard & Crompton, 2004). In addition, cities anticipate that tax revenues will rise as a result of increased economic activity, or sharing in revenues generated by the venue itself (Rosentraub, 1997a). Second, a facility and team can enhance community image (cf. Baim, 1994; Duquette & Mason, 2008). Finally, sports facilities provide additional recreational amenities for residents and contribute to the community's quality of life. Examples of this might include "the satisfaction people get from living in a 'big league' town, from having another topic of conversation that is common to most citizens, [and] from reading about [a team's] successes and failures in the newspaper" (Zimmerman, 1997, p. 121). However, Johnson noted that "communities should

not expect to recoup their stadium investment on a dollar-for-dollar basis" (Johnson, 2000, p. 146). This is because the actual economic development benefits of hosting franchises have been overstated (Coates & Humphreys, 2000; 2003; Hudson, 1999; Humphreys, 2001; Rosentraub, 1997a), so much so that enhanced image and quality of life arguments have become stronger arguments for facility proponents (Gratton & Taylor, 2000; Howard & Crompton, 2004; Shropshire, 1995). Nonetheless, economic arguments are still made in order to generate support locally for stadium construction, relying on faulty economic impact studies (Baim, 1994) "conducted by well-regarded consulting firms using generally accepted, though not necessarily accurate, techniques of analysis" (Utt, 1999, p. 4). For example, proponents of Toronto's Skydome (now Rogers Centre) promised that the facility would generate $450 million in its first year of operations and create 17,000 jobs (Coates & Humphreys, 2000). The stadium, which would ultimately cost taxpayers over $300 million (Rosentraub, 1997a), made $17 million in its first year of operations and was most recently sold in 2004 for $25 million (a fraction of the cost of its construction).

Once facilities are built, the interests of the city and the team quickly diverge. While teams are interested in moving to downtown locations in order to access lucrative corporate clients more easily (Altshuler & Luberoff, 2003), teams try to capture revenues solely within the facility whereas cities hope for more spending and economic activity surrounding the facility (Gamrat, 2002). Other issues concerning stadium development include neglecting the opportunity costs of public investment, where alternative uses of funds are not considered (Noll & Zimbalist, 1997, p. 62), or the tendency for high-profile projects such as sports facilities to overshadow and/or marginalize other important civic concerns, such as schools, parks, housing, and libraries (Euchner, 1993).

Despite the apparent lack of benefits to cities described above, there are some who *do* stand to gain from the construction of sports facilities. In this case pro-growth advocates in cities continue to view a new sports facility as a solution to the economic development needs of their communities (Turner & Marichal, 2000). In other words, there are certain groups within cities who have an interest in ensuring that a facility is built. For example, franchises and local newspapers have a mutual interest in the home town, which leads papers to provide extensive and sympathetic coverage to local teams (Danielson, 1997; Friedman & Mason, 2004). Because newspapers and other media are often owned or controlled by part of the local power structure in a city, the media share a common interest with pro-growth advocates (Delaney & Eckstein, 2003, p. 18). More specifically, "the newspapers are expected to be sympathetic to the demands of other growth actors because the paper stands to profit from growth through circulation and advertising sales" (Turner & Marichal, 2000, p. 192). Thus, the media often provide a platform to project a pro-growth agenda, which frequently includes the construction of a sports facility. In addition, construction companies, contractors, banks and bankers who arrange for financing, architectural firms, and team owners also benefit (Zimbalist, 2003, p. 32). Thus, while the cities themselves may not realize direct economic benefits, there is a concentrated group of stakeholders who stand to benefit from construction (Friedman & Mason, 2004). In contrast, those who stand to lose from stadium construction tend to be widely dispersed; "this means that proponents of public subsidies have a strong economic motivation to work very long and hard to ensure that the subsidies are forthcoming, but opponents have less incentive to resist the subsidies" (Rock, 2001, p. 4). It is also important to note here that stadium benefits are not limited to private interests, as political interests can be furthered by pushing a stadium agenda (by 'saving' a team or acquiring a new one), or damaged by losing a team to relocation (Euchner, 1993; Riess, 2000). As a result, political and business elites that control decision making in a city have a strong incentive to work together to finance a sports facility (Howard & Crompton, 2004, p. 85). With the construction of Jacobs Field in Cleveland, Sidlow and Henschen (1998) described the policy process as "an almost

seamless web of wealthy, well-connected sports entrepreneurs, politicians, and business executives [who] were interested in continuing downtown revitalization, and saw a new stadium complex as part of the strategy (p. 84).

A Proposed Arena Development Project in Edmonton

The current paper explores a contemporary example in the city of Edmonton, Alberta, Canada. The city of Edmonton has had a long standing affinity for the game of hockey, including successful amateur teams in the 1950s and 1960s. However, the city's first real taste of big-league hockey came when "Wild" Bill Hunter acquired a franchise in the fledgling World Hockey Association (WHA) in 1972. The early success of the Oilers franchise – especially in comparison to the financial struggles of other WHA teams – lead to the construction of a new arena in 1974. The facility was named Northlands Coliseum (later Edmonton Coliseum, Skyreach Centre and finally Rexall Place), owned/controlled by Northlands, a non-profit entity that operated arm's length from the City.

The team had the good fortune of acquiring the rights to star player, Wayne Gretzky, and when the WHA eventually merged with the National Hockey League (NHL_ in 1979, Gretzky remained with the Oilers. Building on the foundation of Gretzky, and through drafting strong players, the team won its first Stanley Cup championship in 1984, only five years into the team's NHL existence. The team would win four titles in a five year period, and won again in 1990 after it had traded the rights to Gretzky to Los Angeles. Perhaps Edmonton hockey fans had been spoiled by the competitive success of the Oilers in the 1980s, and as the team embarked on a less successful series of campaigns in the early 1990s, attendance waned at games, and the limitations of the arena, which lacked many of the revenue generating amenities found in newer arenas, loomed larger. The arena underwent a significant renovation in 1994 that saw seating capacity drop in favor of the introduction of new luxury suites on the facility's concourse level.

Through 2005, the arena had undergone some periodic upgrades but by the fall of 2005, Oilers management considered the facility to be, in the words of its CEO, "getting tired" (Mah, 2007). Recognizing that the Oilers' lease with Rexall Place was expiring in 2014, the City undertook some preliminary research by hiring an outside consultant to provide an overview of arena development projects in order to prepare the city for the team's impending expectations for a new facility. This occurred in the Fall of 2006 and was completed in the spring of 2007. In 2007, the City, Northlands, and the Oilers, under the guidance of the Edmonton Mayor, began a process to prepare a written document that provided some recommendations for a new or renovated facility for the Oilers. In the meantime, Northlands hired arena designers, HOK, to conduct a feasibility study into the renovation of Rexall Place, which was completed in early 2007.

The Edmonton Arena Feasibility Committee was made up of prominent members of the community, including several with ties to the Oilers and Northlands. Two subcommittees were also formed, Financing and Community and Design. The group also commissioned leading expert of sport and urban infrastructure development, Dr. Mark Rosentraub, who prepared a report as a supplement to the arena committee's final document, *City Shaping*, released in March of 2008. Among its recommendations, the document strongly advocated for locating the facility downtown, and using public funds, the debt which would be serviced by a "community revitalization levy" on business activities in the area surrounding the new arena.

In February of 2008, the University of Alberta and Edmonton Chamber of Commerce co-hosted a conference on The Role of Sports and Entertainment Facilities in Urban Development. The conference featured speakers from both the Academic and business communities, and focused on the successes and issues associated with broader, arena-anchored

urban development projects in other cities throughout North America. The conference sought to provide more context for Edmontonians as the arena issue continued to move forward.

This became the starting point for an ensuing discussion about the need for a new or renovated facility. Another issues woven into the debate related to the ownership of the team. In 1998, a groups of business leaders stepped up to buy the team from the previous owner, Peter Pocklington. The group took a stewardship approach to the franchise and as the notion of a new facility arose, questions were raised about the willingness and ability of all or some of the group to step up financially to fund a comprehensive arena development project. In the meantime, local drugstore magnate, Daryl Katz (Katz Group), made several attempts to purchase the team, which he eventually purchased in June, 2008, for $200 million. This may have also changed public perceptions of the role of the Oilers in the arena project, given that he was perceived to possess greater wealth and ability to fund the project privately.

As this paper is written, the process for the arena is ongoing. The Katz Group has acquired or hold options on nearly twenty acres of downtown land, and is working to develop a design model which will presumably be brought to the city. The issue has received substantial coverage in the local media, with commentary and coverage appearing almost daily. It is also important to note my own personal involvement in the arena issue in Edmonton. I was the consultant hired by the city of Edmonton in the fall of 2006, and also organized the conference held in February 2008. I have also made substantive comments in the media regarding the arena issue.

Method

Theory on media framing undergirds the analysis of newspaper coverage of the arena development project in Edmonton. Framing is rooted in communication research (Bryant and Miron, 2004) and has been employed across many academic disciplines (Van Gorp, 2007). Frames are "schemata of interpretation" that allow users to "locate, perceive, identify, and label a seemingly infinite number of concrete occurrences defined in its terms" (Goffman, 1974, p. 21), and can be defined as, "*organizing principles* that are socially *shared* and *persistent* over time, that work *symbolically* to meaningfully *structure* the social world" (Reese, 2001, p. 11). Thus, frames can provide context and create meaning for their audience (c.f. Gamson and Modigliani, 1989), and are found within texts. They are "manifested by the presence or absence of certain keywords, stock phrases, stereotyped images, sources of information, and sentences that provide thematically reinforcing clusters of facts or judgments" (Entman, 1993, p. 52). Frames organize experience through the selection and presentation of issues, as well as through the way in which certain issue attributes are emphasized or excluded (Tankard, Hendrickson, Silberman, Bliss and Ghanem, 1991; Gitlin, 1980).

The methodology used in the current paper employs a similar procedure to that used used by Buist and Mason (in press). The City of Edmonton tracks media coverage of issues germane to the City, including that of the new arena project. Articles, letters to the editor, editorials, and other published commentary were obtained from the city of Edmonton in electronic format, representing 470 pages of coverage, from December 2008 through mid November, 2009. While this represents a comprehensive database of all arena stories from this period, it does not capture some of the earlier discussion in the local media. In addition, the coverage remains ongoing as the issue remains a hot button topic in Edmonton. A modified content analysis (Suddaby and Greenwood, 2005) of both manifest and latent content was conducted. Berg (1998, p. 226) defined manifest content as, "the surface structure present in the message" and noted that latent content represents, "the deep structural meaning conveyed by the message". The focus on latent content is important as, "media texts often contain only portions of a frame and rely on audiences to infer the rest based on their

existing cultural knowledge" (Edy and Meirick, 2007, p. 125; c.f. Gamson and Modigliani, 1987). The modified content analysis was completed in several phases as outlined below.

Following Buist and Mason (in press), arena coverage from five local newspapers (the *Edmonton Journal, Edmonton Sun, Edmonton Examiner, See Magazine,* and *Sherwood Park News* were coded based on four frames identified by Buist and Mason (2009): 1) economic development, 2) civic status, 3) civic priorities, and 4) financing. Thus, the first phase of data analysis involved a form of deductive analysis. In addition, given the current state of the global and regional economies, data were also coded for an additional frame – economic downturn. In the second phase of data analysis, an inductive approach was undertaken to determine if any additional frames existed in the Edmonton context. This occurred through the identification and classification of common words and phrases within the data collected (cf. Entman, 1993). It is important to note that a single data point (article, editorial, or letter) may have contained several frames. Finally, chronologically ordered matrices (Miles and Huberman, 1994) were constructed around the frames in order to organize the coding and analysis of data.

Results

The four frames from Buist and Mason are detailed below, along with findings from the economic downturn frame. In addition, two additional frames, relating to the comprehensiveness of the project and the need for public consultation, are also discussed.

Economic Development

As in most arena debates, the issue of economic development figured prominently. However, in contrast to many other arena development scenarios, few proponents have introduced fantastic descriptions of the economic benefits that would be obtained through the construction of the arena. This is due to a number of factors. First, other research has shown that arena proponents have moved toward the use of intangible benefits to argue the merits of sports facilities in cities (Buist & Mason, in press). Thus, this may reflect a general trend in the discourse surrounding media coverage of facility development. This is likely due to the growing influence of the academic researchers who have developed a body of literature that questions the economic impact studies commissioned by proponents. In the case of Edmonton, there are two other reasons why this likely occurred. First, working as consultants on the project, and as contributors to the *City Shaping* paper released by the arena feasibility committee, another consultant and I were quick to clarify that supporters of the project could not credibly make strong justifications that an arena was indeed an economic engine. Thus, arguments for the development have focused more on the need to shift economic activity into the downtown core, as part of a revitalization plan. Second, the University of Alberta hired one of the leading experts on sports facilities and economic impacts, Dr. Brad Humphreys, in 2007. The presence of Dr. Humphreys, who could be called upon to refute any outlandish claims of economic benefits, also likely acted as a deterrent for proponents of the development in Edmonton to make many bold economic impact statements.

For this reason, arguments for and against the downtown development tended to focus on the utility of an arena in revitalizing the downtown core, and whether or not the downtown needed revitalizing at all. According to the Mayor,

"This is a project whose time has come….I think it will be a remarkable thing for our city and downtown." McKeen, S. (2008, December 15, p. A10). Others suggested that they would be more likely to come to the city to watch events in a downtown facility (Sound Off! 2008). In addition, in the

absence of any economic benefit arguments, proponents focused on the different groups that would benefit, including the NHL's Commissioner, Gary Bettman:

A building that is used not just for hockey games but for concerts and family shows and conventions can revitalize an area in the city. It can attract tourists. And it is something that is really critical, I think, both for the future of the Oilers and the city. (Jones, 2008, p. S3).

One city councilor argued that a downtown arena could be a catalyst for a much broader revitalization program (Landry, 2009b), a sentiment quickly championed by Oilers President and CEO, Patrick LaForge: "From my point of view, and the project's point of view, it's about Edmonton and developing a part of a key area of our city in the downtown core….It's an area that needs some refurbishing and redeveloping" (Van Diest, 2009, p. S4). Similarly, an unnamed source noted that:

This is not just about a hockey team or an arena. The city's need to revitalize the core creates this once-in-a-lifetime opportunity, and a development like this only works if you have the kind of anchor tenant that an arena can provide (Lamphier & Kent, 2009, p. A1).

Thus, as the debate continued, the development was positioned by proponents as an opportunity for hockey fans and the team, along with those interested in attending other entertainment acts. It was also positioned as an opportunity to jumpstart other development in the downtown, including expansion of the local light rail transit system (Davies, 2009).

However, the economic development arguments put forth by proponents returned to more traditional arguments when Commissioner Gary Bettman gave a luncheon presentation at the Edmonton Chamber of Commerce in December of 2008. Bettman emphasized the need for a new arena, and the need for public dollars to subsidize it. Stepping away from the more conservative rhetoric used by local proponents, Bettman exclaimed "It is imperative that the Oilers have a new building….It can become an economic engine. It can attract tourists. It is critical both for the future of the Oilers and the city" (Barnes, 2008, p. A1), adding that "I'm a big believer in downtown arenas. They are great economic energizers" (Jones, 2008, p. S3).

Even those in favor of the new development were wary of the display of exuberance, and raised questions about Bettman's role in the development McKeen, S. (2008a):

Edmontonians understand which foot the skate's on in this regard. Because of that, they will doubtless decide to back a privately financed replacement for shopworn old Rexall Place. The potential benefits for the whole community are not exaggerated by Mayor Stephen Mandel. But, please, leave us alone to make this major change to the fabric of our city on our own time, in our own way. (Gary Bettman's free advice, 2008, p. A18).

Not everyone was enamored with the possibility of a new arena downtown, or agreed with the economic development benefits put forth by supporters. A focus of these criticisms was on the "dead time" created during non-event times and dates, and whether an arena was needed as an anchor for such a project (Griwkowski, 2009, p. 10). Others were quick to note that successful arena-anchored development projects were the exception, rather than the norm in other cities, and that while an arena development might increase the number of visitors:

It's foot traffic,' says Brad Humphreys, a professor of economics at the U of A who lectures on the economics of sports arenas. 'But it's also drunks and a lot of people staggering around.'

But Humphreys points to St. Louis and Washington, D. C., as cautionary examples, places where major new baseball stadiums did little or nothing to spur promised residential projects. Both ballparks, he says, remain surrounded by huge vacant lots. Simons, 2009a, p. A12).

Another interesting counterargument suggested that the project might be damaging in its own success; that is, it might successfully attract so much activity that it might harm other parts of the downtown, acting "as a vortex, sucking up investment and entertainment dollars, not to mention existing retail and office tenants, from the rest of downtown (McKeen, 2009d, B1).

In sum, the economic development frame in Edmonton has focused on the value of building the new arena downtown as part of an urban revitalization program. Both supporters and opponents have both argued how they view an arena's role in generating a successful revitalization plan.

Civic Status

The civic status frame figured prominently in coverage of the arena issue in the local press. Edmonton had several incidents in recent years that reveal an undercurrent of concern about the city's image, at least in the eyes of those outside

of the city. One relates to a negative report about the city by a *London Daily Telegraph* reporter covering the IAAF World Track and Field Championships held in 2001. The article, titled "Deadmonton Comes Alive" described the Alberta capital as a "visually unappealing corner of Canada," igniting a firestorm of controversy locally. The article's author, Robert Philip, later wondered, "What puzzles this observer is that if Edmontonians are so confident about their city's greatness, why do they give a monkey's about what some visiting hack might think? But they do" (Reporter expresses regret, 2001, n. page). More recently, the highly publicized request of star player, Chris Pronger, who requested to be traded following the Oilers' 2005-06 season, has lead to concerns about the image of the city. This has been exacerbated by more recent attempts to sign and trade for high-profile players, who have accepted less money to play for other teams in other cities.

In terms of coverage of the arena in local newspapers, a focus has been on the progression of the city from a smaller, more familial community to an economically powerful, emerging city. Thus, debate surrounding the arena has been couched in terms of how the arena development can help the city reach a certain status amongst cities, and/or whether reaching this status is even something that matters to Edmontonians. For the most part, however, appeals to status were employed by those supporting the development project. As explained by one local columnist:

Like all high-profile and expensive projects, the arena brings out the best and the worst in Edmontonians. The best: a willingness to debate. The worst: a tendency to disparage bold ideas and bold thinkers, to wallow in negativity and self-loathing, to return to the abiding, operatic theme of potholes. (Babiak, 2008, p.B1).

For proponents, site selection was frequently articulated in terms of vibrancy, where supporters such as Mayor Stephen Mandel noted that "Edmontonians…sometimes forget how important a vibrant downtown is to a city's reputation and sense of itself (McKeen, 2008a, p. A10). In this manner, opponents were branded as hicks who could not contemplate the vibrant world-class city that an arena development project could build toward, and other cities with busier downtown cores were cited as examples of what Edmonton should aspire to (McKeen, 2008a). As a result the cost of not supporting the project was the (perpetuation of the) city's poor image elsewhere. The civic status frame was also bound to the financing frame, as many opponents were quick to note that the many of the cities that Edmonton aspired to – such as Vancouver – had built their own facilities using private funds (Jones, 2008). One author also tapped into Edmonton's rivalry with Calgary in articles appearing in both Edmonton and Calgary papers, noting that "the shovel isn't in the ground yet -- but the fact the Oilers now have earth to move is enough to have Calgary fans drooling with envy" (Platt, 2009b, p. 2), and that "Surely Calgarians can covet just a little, as Edmonton moves a huge step closer to replacing Rexall Place with an ice palace that will make the Saddledome look like the wooden skate shack at the local outdoor shinny rink" (Platt, 2009a, p. 23). In this manner, the arena project was articulated in terms of delivering a certain "world" or "first –class" status to Edmonton, (Klein, 2008), along with "all kinds of social, cultural and economic benefits to Edmonton" (Lamphier & Kent, 2009, p. A1).

The notion of changes to the city's position within a hierarchy of cities also figured prominently in coverage of the debate, where terms like world class (Lamphier, 2009b) figured prominently: "'People like to throw around the word world-class a lot, but I think (the arena project) should actually be measurable to that standard and not just Edmonton-class, or what we've experienced in the past,' says urban planner Dave Onishenko" (Staples, 2009a, p. E4). This rhetoric was widely used by Oilers CEO Patrick LaForge, who suggested that a comprehensive arena development would make Edmonton the "Greatest Northern City" (Kent, 2009b), making the city much more attractive for tourism, relocation and investment. (Van Diest, 2009; Staples, 2009a). To emphasize the need for a new facility, other Oilers executives touched on the notion of status to express the franchise's needs: "'We're a world-class city now and unfortunately our building is not world class,' Oilers hockey operations president Kevin Lowe has said" (Staples, 2009d, p. E1). Similarly, Oilers owner Daryl Katz emphasized the broader development, claiming that: "Like a lot of Edmontonians, we are very excited about the prospect of a revitalized downtown and a new multi-use development that can make Edmonton the place to be" (Jones, 2009, p. S3). Even players spoke to how the development could elevate the city and the downtown: "'I'm an Edmontonian and I think it's a great thing for the city,' said [Oilers defenseman] Jason Strudwick…. 'It will continue the revitalization of downtown that we have to keep pushing. We want to have a good, vibrant downtown'" (Tychkowski, 2009, p. S3).

Status arguments were not limited to local politicians and the franchise itself; for example, one letter to the editor (from "Frank") appealed to Edmonton's inferiority complex and tied this directly to the downtown:

I fully support a new downtown arena and would be more than happy if my tax dollars went into funding it as opposed to things I never use, i.e., ETS, homeless shelters, public schools, etc. I realize that those things are probably more important than the arena but I pay for them through my tax dollars and get no benefit. People do not seem to realize that our downtown is the single biggest reason that our city has an image problem. I've been to every major Canadian city and Edmonton's downtown is truly embarrassing when compared to Toronto, Montreal, Vancouver, and even Calgary. The downtown arena will not solve this problem; however, it is a giant step in the right direction. (Sound Off! 2008, p B3).

Another letter claimed that "Edmonton is on the cusp of making the transition from a mid-sized prairie city to a dynamic major Canadian city. The new arena will mean a new future in Edmonton" (Davies, 2009, p. A15). Similarly, another wrote that "The proposed new arena and entertainment district has the opportunity to create a dynamic and animated public place that will become a major focal point for our downtown and the region" (Dulaba, 2009, p. A16).

Some of those who saw the arena development as an opportunity were generally concerned about the lack of architectural uniqueness, a concern that could be addressed by a spectacular arena and district design (Staples, 2009a) that could overcome the generally bland, anonymous streetscapes (Towering vision, 2009). Others cautioned that it was smaller cities that felt a sense of inferiority that tended to subsidize these developments (Staples, 2009a). Even those not overtly supporting the project acknowledged that the arena development provided an opportunity "to build an architecturally striking, world-calibre sports and concert facility, and a chance to rejuvenate our city core" (Simons, 2009a, p. A12).

Even the debate over control and operations of the building became bound up in notions of world-class status and the caliber of facility and the events held there. While Northlands continued to operate the existing facility and planned on having some participation in the new one, grumblings out of the Oilers organization hinted that the new facility would be out of the non-profit's league: "The implicit message: Northlands may run a decent show in Edmonton, where it's insulated by government largesse, but if the city's new arena complex is going to be truly world class, it needs to be run by a world class [arena management] team" (Lamphier, 2009b, A1). This was later corroborated by Oilers CEO, LaForge:

We're interested in being the best in the world. I'm not trying to poke Northlands in the eye here. ... Northlands has done a good job so far. Nobody would have an issue with that. (But) the new world is big operators like AEG, Live Nation and the like. They are creating a new world of preferred outlets that they bring their best Triple-A entertainment to, and we want our place to be one of those stops. (Staples & Lamphier, 2009, p. A1).

Thus, notions of world class and the status of the city were used as a way of articulating the benefits that the new development would provide, while also providing a means for stakeholders to engage one another around their possible roles in the project.

Civic Priorities

The civic priorities frame was consistent with that found in other arena development debates, where justifications for the use of public funds were couched in terms of their opportunity costs. For opponents in Edmonton, this seemed to put the arena project at odds with basic services, and also became bound up in general dissatisfaction with the performance of local politicians. As the city moved into the recession, some columnists voiced concerns over spending approved by city councilors: "A majority of them agreed to borrow $1 billion for civic projects -- almost half of it for palatial new recreation centres. In doing so, council established a new financial benchmark in the public consciousness" (McKeen, 2008a, p. A10). Because the city agreed to push forward with several large-scale infrastructure development projects in spite of economic uncertainty, the likelihood of putting additional funds towards an new downtown arena seemed more remote. As suggested by Councilor Linda Sloan, "I don't see that kind of facility serving the needs of Edmonton….If the Oilers or if the National Hockey League want to contemplate building a facility, I think it's up to that sector to build it" (Landry, 2008, p. 2). Councilors from neighboring communities agreed; Jason Gariepy of Sherwood Park cautioned against nearby Strathcona County being brought into the funding issue (Di Massa, 2009). As explained by Gariepy himself, "I don't believe that City of Edmonton taxpayers are willing to service a big fat loan for the arena. I don't believe there is an appetite to use public funding for a private venture" (Gariepy, 2009, p. 9).

With funds becoming more scarce, other local politicians questioned the use of public funds to subsidize professional sports franchises (Diotte, 2009a). Locals also wrote into the newspaper to vent about the potential use of funds for an arena when they could clearly identify other, more pressing needs: "Instead of spending hundreds of millions of dollars on a hockey rink we don't need, how about spending that money on a couple of bridges that would make it easier to get into and out of downtown?" (Venting, 2009d, p. B12). Similarly another opined that

"Instead of spending hundreds of millions of dollars on a hockey rink we don't need, why not spend that money on improving the Yellowhead [Highway] instead? The traffic is getting worse every day, with no improvement in sight" (Venting, 2009b, p. B2). Others felt that the arena project would serve too few to justify any public investment: "An arena serves relatively few people and should not be the centre of the city. Not only is this a poor use of the property, but taxpayers should hold the mayor and council more accountable for these ridiculous, self-serving projects" (Dubeta, 2009, p. A17). Building on the sentiment that the arena project served too narrow a constituency, others complained that putting an arena downtown would cater simply to "rowdy fans", whereas "A diverse atmosphere of people and activities in the core would appeal to a more diverse population of visitors" (Stewart, 2009, p. A16). Concerns regarding the gentrification of neighborhoods also arose, with suggestions that "it would take serious political will to enforce any social housing or similar conditions on this kind of proposal" (Warnica, 2009, p. B1).

The fact that the team and its players would benefit heavily from a new facility was not lost on many observers:

How often do we allow someone to reach into our pockets and pull out not only our loose change but our credit card as well, so we can spend tomorrow's dollars to help fund a small number of multimillionaires who try to convince us that it is necessary if we want to maintain our privileged position of having major league sports franchises in our city? (Fan Forum, 2008, p. C2).

In addition, there was also an underlying resentment towards the Oilers organization, where the team and its management arbitrarily decided what was best for the local community (including a new arena downtown). One comment went so far as to accuse the Oilers, who created a charity lottery, of hurting another local charitable lottery by saturating the market for lotteries in the city (Fan Forum, 2008, p. C2).

The Oilers were more careful to try to disassociate from other controversial issues, including the issue of closing the city's downtown municipal airport. When Oilers Chairman, Cal Nichols, emerged as a champion for keeping the airport open, concerns were raised about how this would be viewed in light of the team's desire for a public subsidy for the arena (McKeen, (2009a; Staples & Gerein, 2009). As a result, Nichols relinquished his duties with the Oilers, acknowledging that "There's a number of people on the political side in City Hall that are of opposing view to me [in keeping the airport open], but at the same time (the) Oilers and Katz Group are trying to work with them on the development of a new downtown arena district and my being around the table is becoming an issue" (Virag, 2009, p.3).

To summarize, the arena debate was framed in terms of civic priorities as proponents prioritized the revitalization of the downtown; those unable to view the potential for the arena project to do so simply could not "see it yet" (Mackinnon, 2009b). In addition, opponents were considered cranks who opposed all kinds of forward-thinking development:

Bidding on Expo 2017 is too much money, bidding on the Universiade was too costly, and a hockey arena downtown is too expensive and will cause traffic problems. The LRT [light rail] is too futuristic, the Henday [ring road] is too noisy, and the cost of the 23rd Avenue interchange is prohibitive. Finally, the City Centre Airport is the jewel of Edmonton. Do you think maybe Tourism Calgary hired all these people to keep us stuck in the 1970s? (Venting, 2009a, p. B2).

In contrast, opponents clearly outlined the infrastructure and groups that would be better serviced by the funds that would need to go into the project, which would be primarily for the benefit of the team and its players. As the economy continued to decline, this only exacerbated the problem for some critics (to be discussed in greater detail below):

The front page of Saturday's Journal summed up the obscenity of financial management in the province of Alberta. The main headline is about the Katz Group and Northlands contending for the $1-billion prize of managing the new $450-million downtown arena;an arena that will largely be funded by taxpayers. A story lower on the page says Education Minister Dave Hancock may insist on cuts deeper than the $44 million already sought, with rumours indicating cuts will actually total hundreds of millions of dollars (Griwkowski, 2009, p. 10).

Financing

By far the most dominant frame in Edmonton newspaper coverage related to financing – who would be expected to pay for the arena development project and how the financing model would operate. Given that there is no such model in place at the time of this writing, all of this discourse remains speculation. From the perspective of arena supporters, the use of public money was justified, as there had been a history of public funding for sports facilities in the province, and comparisons were drawn to the new, publicly funded art gallery (Staples, 2009b). The team argued that it needed more arena-related

revenues to reduce the disadvantages it had in comparison to other league clubs (Staples & Lamphier, 2009). This was reinforced by NHL Commissioner, Gary Bettman, who proclaimed that "There is no way a building can be built here without a significant public investment" Jones, 2008, p. S3). Pro-arena supporters responded to opponents by arguing that tax revenues already went to many services that that citizens did not necessarily use:

Let's get it done already! To all those who don't want their tax dollars funding it I say, well, a lot of my tax dollars go to fund all sorts of stuff I don't and will never use and don't want to fund yet my tax dollars still go there so that others in the community can enjoy these things. That's life. Let's just do it already! (Sound Off! 2008, p. B3).

However, there was a strong response from those who did not want to see any tax dollars going towards the project, especially where the beneficiaries were private entities: “as nice a fellow as Mr. Katz may be, he doesn't deserve a free boost of hundreds of millions of dollars to help further milk the population behind closed doors” (Griwkowski, 2009, p. 10). This argument was not limited to non-hockey fans; in many cases those opposed were strong supporters of the team: “ I love the Oilers but I strongly object to our tax dollars building a play-ground for millionaire players and a billionaire owner. There are much better uses for our money” (Venting, 2009c, p. B2). This suggested that opposition might be linked to resentment fans had towards the salaries paid to players (Staples, 2009). Thus the core debate remained the appropriateness of using taxes to pay for the facility (Barnes, 2008).

Other groups, such as the Canadian Taxpayers Federation, became more vocal as the debate ensued; Alberta Director, Scott Hennig, professed that "Our only concern is that taxpayers' money not go into building a new arena," and cited other recent privately funded NHL arena development in Canada (Staples, 2009a, p. A1). In response, supporters tapped into the city’s alleged inferiority complex as a way of swaying public opinion:

If public money is deemed to be necessary, though, winning the hearts and minds campaigns will be crucial, Onishenko says, and the battle won't be easy, given the negativity in Edmonton. "We are a city of disbelievers and self-doubters at times, who like the growing vibrancy of our southern counterparts, as well as Vancouver, Toronto, but don't believe we can achieve something similar here, and are content to settle with our urban monuments of mediocrity.” Staples, 2009, p. A1).

The debate also shifted from the use of taxes in general, to the *types* of taxes required or to be used to service any public debt.

For the most part, letters to the editor were not concerned about the form of the tax; rather, they viewed the anticipated need for public money as directly affecting their finances:

As I'm driving down the heavily constructed 111th Avenue, trying desperately to figure out if any of the side streets are open for traffic, I'm contemplating this latest development scheme for the downtown core. Not being a mathematical genius, I'll use simplistic math because that seems to work for everyone else. If the new development costs $1 billion and the new owner chips in $100 million, that leaves $900 million owing. It's easy math--$900 million, three million Albertans, a mere extra $300 for every man, woman, child. In my household of three, that would only be$900. Collection would be the city's problem. (Pryer, 2009, p. A18).

Others were more succinct: “Let the business suits play at development and leave me and my taxes out of the equation. I don't trust the mayor when he says "no current taxes" will be used for the arena” (Taylor, 2009, p. A18). Another commented that “While the arena may be spectacular, citizens' awe will end when traffic problems become a daily frustration, and when they are called upon to pay for the arena through their taxes so a few people can get richer” (Kisilevich, 2009, p. A19). Concern over tax increases was linked directly to a recent general property tax increase (Gerard, 2009; Hanon, 2008).

The backlash was exacerbated when advice was given from others on the issue. This was directly particularly harshly towards the NHL Commissioner. When Bettman made his announcement re: the need for public funding, one response was “Let Bettman move to Edmonton and pay his taxes toward that stupid arena” (Venting, 2008, p. B2). As another wrote:

Wow! Thank you Mr. Bettman for your wonderful insight on our city. Maybe on your way, you may have noticed we need other things more important than another building for millionaires. Maybe they can put their own $$ into the building and leave us taxpayers alone. You know the taxpayers that cannot afford the luxury of watching grown men slap a piece of rubber around and get paid millions for it. You know, ordinary people that have nothing to do with this building, and only want to support their own families. Maybe another homeless shelter would be better suited. I know it would certainly be more needed. (Sound Off! 2008, p. B3).

In the same coverage, another commenter suggested that it was “Easy to say, Mr. Bettman, when you won't be affected in any way, shape or form financially if this fiasco goes ahead. We will be the ones choking down another insane tax hike -- mark my words” (Sound Off! 2008, p. B3).

As the issue of funding continued to swirl, the Mayor became outspoken about the use of taxes, reporting that the new development would have no impact on property taxes (McKeen, 2008a). While the use of a community revitalization levy had been suggested in March of 2008 with the release of the *City Shaping* report, opinions remained split on the utility of such a mechanism:

No, your property taxes won't rise. The only taxes supporting the project will come from the project itself. No project, no taxes to fund it. I'm fine with this idea. But many Edmontonians are not. More important, a number of city councillors are seriously leery. (McKeen, 2008b, p. A11).

This was viewed by some as a form of creative accounting. Thus, although Mandel clearly stated that "If you live in Edmonton, your current property tax dollars will not go into it, nor will mine" (Landry, 2008, p. 2), some were cautious:

Pardon me, Mayor Mandel, if I don't applaud. You promise us that none of the arena's estimated $450-million price tag (not including at least six acres of prime real estate) will be paid for with what you term "current property tax dollars." You'll have to forgive us for cringing at the word "current." (Hanon, 2008, p. 10).

The proposed community revitalization levy (CRL) would use incremental increases in tax revenues for the surrounding development to service the debt from the public investment. Although still a tax, this would reduce the directly pinch of a taxpayers would feel. Proponents argued that it allowed those who supported the project – by living, shopping, attending events – to bear the public’s burden for the development. This also served to create the need for a much larger development project, as there would need to be enough alternative types of development to generate the necessary taxes to service the debt (McKeen, 2009d). However, for the duration of the newspaper coverage reviewed in this paper, no definitive model was developed that explained how the CRL would work. Instead, the Mayor invited speculation with comments like

"There's a variety of methods to do it. I think at this point in time it's premature to discuss how it can be funded. We'll leave it as it is" (Landry, 2008, p. 2). As a result, the proposed project was described as being funded with “creative government cash” (Hicks, 2009b, p. 6).

The lack of a formal funding model and uncertainty about the use of a CRL versus other forms of public funding created a demand for more transparency and a lack of trust on the part of stakeholders in the community. Columnists began to question the benefits to the city, and the motives of the team owner, especially with no large scale vision that could be used to develop the CRL: “That sounds good, in theory. But where's the guarantee from the developer (i. e., Katz Group) that there would be any upfront spinoff projects that would be built alongside the new arena?” (Lamphier, 2009d, p. E1). Others became more critical of the wording that Mandel was using when promoting the arena:

Go all the way back to Omniplex [another arena development project], defeated in a referendum, and you find a citizenry leery of seeing its tax dollars used on big public projects. Mayor Stephen Mandel promises that your taxes won't fund the arena project. But let's be clear: Taxes will be used to fund the project. (McKeen, 2009b, p. B1).

Another suggested that:

Given the exorbitant tax increase just foisted on us, along with the uncertainty of the economy, surely you'll understand our skepticism over assurances that your new arena won't dig into our wallets. When you finally unveil your financing plan, the question taxpayers will ask is: what's really in it for us?” (Hanon, 2008, p.10).

As the issue dragged on, more speculation continued and a general impatience developed regarding what the city would ultimately have to pay into the project and what the component s of the development would be (Lamphier, 2009a; 2009d), a process described as the “great riddle of the Edmonton universe” (Hicks, 2009c, p. 6). To this point, speculation has lead to a lack of trust for the parties most directly involved in the project (Diotte, 2009b). For this reason, some questioned whether the project would be able to receive widespread public support (Fekete, 2009).

In terms of political support, while the Mayor clearly was a champion of the proposed development, others in the city and at other levels of government were less enthusiastic. In fact, Alberta Premier, Ed Stelmach, directly addressed the issue, stating that "It's very clear we're not putting money into arenas" (Staples, 2009b, p. A1). Even political candidates from other parties attempted to distance themselves from the use of funds for the arena project (Diotte, 2009). In October, 2009, the Mayor of Quebec City announced his intentions of building a new arena, funded from several levels of government. This did not alter the position taken by the Premier in Alberta: “’The request by the Quebec City mayor has no impact on the premier's

position,' says Tom Olsen, Stelmach's media relations director. 'His position was and continues to be that there will be no direct public financing of privately run hockey arenas in Alberta'" (Lamphier, 2009f, p. E1). Given that Mayor Mandel also promised that "We would not use grant money from the federal government (provided) for other projects" (Lamphier & Kent, 2009, p. A1) it is understandable that speculation regarding the burden faced by local taxpayers would grow.

Another issue related to financing that arose was concerned with the involvement of Northlands. As operators of the existing facility, some observers felt that their involvement was necessary to make to project work financially. Councilor Ed Gibbons, a Northlands board member, doubted that city council would put invest in the project without Northlands' involvement (Lamphier & Kent, 2009). Andrew Huntley, Chairman of Northlands, also argued that his organization's involvement would help to make the project more viable, and potentially require the assistance of higher levels of government (Staples, 2009f). This discussion also related to the question of which party would own the facility, the city, the team, the arena management company, or a development corporation (Kent, 2009b).

Other coverage discussed possible new revenue streams, such as personal seat licenses (Hicks, 2009a) and the use of casino revenues to service the debt. As the issue has moved forward, speculation has arisen regarding the size of the development and the ability of increasing tax revenues to service debt (Lamphier, 2009c; Staples, 2009e). However, no concrete financial model has been produced. As explained by on Katz spokesperson:

Funding models have been discussed, studied and pursued, but that remains very much a work in progress and could go any number of ways. There have been extensive discussions with Northlands, and we have also talked with the city and province, about roles, funding options, etc., but nothing definitive has come of those talks (Lamphier, 2009e, p. E1).

Economic Downturn

As explained above, in addition to coding the data for the four stadium frames identified by Buist and Mason (in press), data were also examined to determine the degree to which the broader economic environment was also influencing the newspaper discourse surrounding the arena development in Edmonton. The region had undergone a substantive boom in the years leading up to 2008, driven by development in the oil sands in northern Alberta. As a result, the global economic crisis had not hit the city and province as devastatingly as other parts of the country. In March of 2008, provincial Finance Minister, Iris Evans, claimed that "Alberta will be relatively well-off because we're safer. ... I think the long-term investments in the oilsands really protect us, so there's a sustainability to our economy that isn't there elsewhere" (Audette, 2008, p. A3). However, by late 2008 the crisis had clearly affected the local economy. One issue that was raised was how, during the boom, the city had not taken advantage of the opportunity to develop more arts, cultural, and entertainment amenities. One local columnist commented that "It was painful to come through a boom without anything to show for it but an art gallery" (Babiak, 2009, p. B1).

However for some, the recession increased the need for a new arena development project, which could be justified on the grounds of cheaper construction costs, which would lower the costs of the overall development (Fekete, 2009). This logic was shared by the Mayor, who claimed that the new arena would create jobs in a tough economic climate (McKeen, 2008a). After arriving in Edmonton to give a speech at a local luncheon, NHL Commissioner, Gary Bettman, suggested that Edmonton had weathered the recession well and was poised to build a new arena: "You build buildings for the next 30 years," Bettman told the press conference. "If you think you're going to be looking at a 30-year depression you certainly don't do anything" (Jones, 2008, p. S3). According to some reports, this sentiment was shared by some on city council (McKeen, 2008a).

However, to others the logic of spending $400 million on a new arena during an uncertain time, even if the region had not been hit as hard as others, was difficult to follow. To them, building such a significant project was unnecessary, especially with several major oil sands development projects stalled (Hanon, 2008). In addition, concerns were raised that there would not be enough discretionary money available to both fans and corporations to sustain the new facility. As one fan wrote:

Bettman, Daryl Katz, Pat LaForge and Co. should be embarrassed to even suggest the construction of new arena for Edmonton at this time. Do they really think businesses and taxpayers would contribute even greater amounts than they are now for a facility that would cost users even more money to access? (Fan Forum, 2008, p. C2).

The economic downturn also increased public scrutiny on public expenditures of all kinds, including capital grants that both NHL teams in Alberta had received through facility renovations (Diotte, 2009). While many continued to acknowledge that the facility would require some form of public subsidy, more argued that the subsidy should be borne by hockey fans and not the taxpayers at large (Sound Off! 2008). As the recession continued, letters to local newspapers questioned the value in pursuing such projects given the need to cut back other services:

Faced with a budget deficit, it is proper for city council and administration to try to cut expenditures and increase revenues with the least negative impact on residents. While I have concerns about some of the specific suggestions that have been put forward, my real beef is more general. That the city is going through this exercise, while continuing to pursue grandiose schemes (the Expo bid and pursuit of a downtown arena, to name but two) which will cost Edmonton ratepayers undisclosed millions, is ridiculous, if not outright negligent (Letters to the Editor Column, 2009a, p. 10).

The issue was exacerbated when it was articulated as a potential tax increase to "fund a new playpen for rich hockey players" (Lamphier, 2009a, p. E1).

Emerging frames

While the four frames identified by Buist and Mason (in press) and economic downturn frame figured prominently in the newspaper discourse surrounding a new arena in Edmonton, two other frames emerged from the data analysis. The first related to the comprehensiveness of the total urban infrastructure development. This was a key for some, who while not in support of a stand-alone facility, discussed a much larger, integrated development. For members of the Katz Group more broadly, and the Oilers more specifically, this was seen as a means to garner wider support from those not interested in the local hockey team:

'This is very much about the city,' said Josh Pekarsky, spokesperson for the Katz Group, on Wednesday. 'It's about far more than an arena. It's about an entertainment and sports district for the city and for the region. There are a number of options being considered.' (Babiak, 2008, p. B1).

In addition, supporters of the arena were then able to articulate its importance in terms of integrating with planned or existing downtown development projects, such as the new art gallery (McKeen, 2008a), and to promote an arena district as a means of revitalizing the downtown on a large scale (Hicks, 2009b; Lamphier & Kent, 2009). In addition, the arena district became embedded in a broader discourse of other Edmonton concerns, including sprawl and the need for greater density (Lamphier & Kent, 2009), and included, at various times, discussion of hotels, performing arts theatres, student housing, a casino, a hockey centre of excellence, hotels, and convention centre development (Jones, 2009, Lamphier, 2009b).

Comments from outside experts thus focused on the need for the city to develop a comprehensive development plan with "the right mix of amenities, such as parks, condominiums, restaurants and stores, creating a city neighbourhood where people will want to live and to visit" (Staples, 2009d, p. E1).

A final frame that emerged from the analysis was broadly concerned with public input; that is, regardless of whether or not one supported the proposed project or not, there was a building consensus that it should ultimately be the taxpayers that should decide if any public funds should be used (Loome, 2009). This was put forth more so by opponents, and was often couched in terms of the use of funds to pay the salaries of millionaire hockey players and the team's billionaire owner.

Another reason why more public input was sought related to trust – trust that the Oilers ownership was really looking after the interests of the public in proposing such a large development project, and also related to the faith that locals had in the political leadership to make the right decision.

So why isn't the population jumping on board enthusiastically? One word: trust. Edmontonians don't trust that they won't get dinged for a tax hike over the development. They don't trust the word of Mayor Stephen Mandel on the issue although he's constantly promised no tax money will go into the thing. Nor do they trust Katz who's almost a Howard Hughes-style recluse. Sadly, history teaches that it's not always wise to trust politicians or sports team owners. (Diotte, 2009b, p. 14).

Similarly, the larger the scale of the project proposed, the more input sought:

The arena's proponents would like to present their bold plan as a fait accompli. But this project will have a radical impact on the shape of our downtown. No matter who pays for the arena, or who profits from it, we citizens should--and do--have the right to decide if this is indeed an appropriate site for this urban megaproject. Just because this particular property deal suits the financial interests of those who are buying the land and those who are selling it doesn't make it good urban planning, or good for the rest of us. (Simons, (2009a, p. A12).

This view was supported by the Mayor, a vocal proponent. In an interview on a local radio station, Mayor Mandel clearly stated that the city would have a "big time say" in the development if public funds were to be used (Staples, 2009e). In addition, the secretive manner in which the team's leaders sought to explore the project also served to draw criticism from those seeking greater public input. As one columnist explained:

Somehow, a project with the potential to transform one's city should be pitched to the citizens not merely by the billionaire who has promised to kick-start it with$100 million.

This isn't merely a matter of protocol. It has to do with buy-in by the population, and that's critical here….That's fabulous, but who elected the Oilers, Katz or LaForge and gave them the mandate to make downtown more livable? (Mackinnon, 2009c, p. C1).

Discussion and Conclusions

The examination of newspaper coverage in Edmonton over the past year has revealed that many of the same frames found in other debates over the public subsidization of sports facilities are present. In the case of Edmonton, because the process is ongoing and has been drawn out over time, additional speculation regarding the financing of the project has become a dominant frame. Interestingly, bold claims of economic impacts have not been used by proponents to the same degree as elsewhere; however, as the project moves forward this does not preclude some of these claims from being made.

Despite the popularity of hockey and the Oilers in Edmonton there does not appear to be an appetite for the use of public funds to pay for a new arena development, nor does there appear to be a sophisticated understanding of how the funding mechanism will work. This is due to the lack of a definitive model being introduced to this point, but also a reflection of a general lack of support for public funding of any kind. While this has been exacerbated by the changes to the broader economy, I do not feel that there was widespread support for such funding when the economy in Edmonton was strong.

As can be found in other situations, coverage of the arena issue has been more generally positive in articles published in the local newspapers; this is a reflection of the local newspaper's role in the broader urban development agenda. However, letters to the editor remain skewed against the development. As the project moves forward, it appears that proponents will have to focus on transparency and building trust with the community in order to be successful. It also appears that those directly involved in the project will have to actively seek out the input of the community to make the development more in the interests of Edmontonians (Mackinnon, 2009b). If and when the issue is resolved in Edmonton, a content analysis of the entire body of newspaper coverage might yield more insights into the balance of media coverage.

There were several themes that were layered through the frames. One relates to the use of public funds to pay hockey players. Although the team's players only indirectly benefit financially from a new facility, resentment toward millionaire players remained an undercurrent in negative reaction to the project. It will be interesting to see how the frames evolve in Edmonton as development plans become more concrete and the city and economy emerge from the global recession.

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A Complex Network Approach to Crisis Recovering in Sport Applications

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Abstract

Network-based approaches may yield a powerful way to govern complex economic systems like the ones we face in sports, and, particularly in football. The network approach should be pursued to clarify which are the appropriate network structure and topologies that can improve robustness to economic crisis by facilitating integration and avoiding undesired synchronization events. This requires primarily the modelling of the interactions of structures and dynamics in complex networks that, in turn, calls for a cross-disciplinary fertilization in order to apply models already accepted and whose impact on real-world problems have been demonstrated. In fact, there is a lack of data adequately describing economic networks, nowadays built on intricate interdependencies, trade relations and supply chains on an international level. In this paper, we try to draw a general picture of what is implied by a complex network approach aiming to develop models that can both reduce the systemic risk of cascading failures and facilitate the recovery from crisis.

Keywords: Complex Networks, Economic Networks, Sports Management, Financial Crisis, Dynamic Synchronization, Network Robustness and Failure

1. Introduction

Crisis can be interpreted as an undesired consequence of synchronized behaviour: a presumably hidden pattern of strong interactions between agents in the financial market is responsible for crashes, in which the interactions are strengthened and the typical parameters measuring network complexity converge to unexpected levels (e.g., the average length is reduced and the underlying tree is packed). However, the existence of a highly networked financial market is also the only way to escape crisis. To understand the non linear dynamics and the evolutionary paths that represent the framework of interactions among different actors is needed to design a possible intervention to overcome crisis constraints.

In this paper, we shall review the main ideas behind complex networks and graphs, aiming to suggest the application of these concepts to the analysis of crisis in order to propose the described methodologies to face the crisis in the sports.

There is quite a subtle similarity in the study of the dynamic brain pattern formation and emergence of particularly relevant states and the evolution of the economic market before crisis. In particular, we suggest that the onset of epileptic seizures (crisis) in the mammalian brain, that is the result of an anomalous synchronization of neuronal groups initially in a focal area of the brain and then recruiting different, also far, areas of the cortex in a sort of progressive entrainment that end with the crisis. Some authors (see P.Parlados) seem to suggest that the epileptic seizure is basically a mechanism of reset of the brain after which the normal working operations can be recovered. Similarly, the market crisis can be seen as a long time evolving operational scenario where the crisis is, somewhat, needed to equilibrate some parameters that cannot be recovered through a linear behaviour.

The current economic crisis illustrates a critical need for new and fundamental understanding of the structure and dynamics of economic networks. Economic systems are increasingly built on interdependencies, implemented through trans-national credit and investment networks, trade relations, or supply chains that have proven difficult to predict and control. We need, therefore, an approach that stresses the systemic complexity of economic networks and that can be used to revise and extend established paradigms in economic theory. This will facilitate the design of policies that reduce conflicts between individual interests and global efficiency, as well as reduce the risk of global failure by making economic networks more robust.

We develop a new framework for modeling innovation networks which evolve over time. The nodes in the network represent firms, whereas the directed links represent unilateral interactions between the firms. Both nodes and links evolve according to their own dynamics and on different time scales. The model assumes that firms produce knowledge based on the knowledge exchange with other firms, which involves both costs and benefits for the participating firms. In order to increase their knowledge production, firms follow different strategies to create and/or to delete links with other firms. Dependent on the information firms take into account for their decision, we find the emergence of different network structures. We analyze the conditions for the existence of these structures within a mathematical approach and underpin our findings by extensive computer simulations which show the evolution of the networks and their equilibrium state. In the discussion of the results, particular attention is given to the emergence of direct and indirect reciprocity in knowledge exchange, which refers to the emergence of cycles in the network structure. In order to motivate our modeling framework, in the first part of the chapter we give a broad overview of existing literature from economics and physics. This shows that our framework bridges and extends two different lines of research, namely the study of equilibrium networks with simple topologies and the dynamic approach of hypercycle models.

While many scale-free (SF) networks have been introduced recently for complex systems, most of them are binary random graphs. Here we introduce a weighted SF network in associated with the cross-correlations in stock price changes among the S&P 500 companies, where all vertices (companies) are fully connected and each edge has non-uniform weight given by the covariance between the two returns connected, normalized by their volatilities. Influence-strength (IS) is defined as the sum of the weights on the edges incident upon a given

2. Complex Networks: a short review

Complex networks are ubiquitous both in nature and in man-made structures. There exist many excellent reviews and fundamental works on this subject; some of them are reported in the references and concerns not only the description of topological features of the underlying graphs but also the characterization of the growth, evolution and dynamics of the networks. The adjective "complex" mainly refers to the consideration of networks composed of a very large of nodes and links (edges) connecting them. The underlying architecture is governed by shared organizing principles. Most of the interesting processes that can be studied starting from the complex network approach, like robustness, tolerance to node failures and fragility to deliberate attacks to a particular class of nodes or edges (for instance, the highly connected nodes) as well as the analysis of synchronization processes have certainly benefited from the recent advances in the knowledge of complex topologies. Some emergent properties of complex networks (being them neuronal networks, the web or the internet, social networks, transportation networks or metabolic ones) are now more understood and novel avenues of researches have been opened.

In this short review, we wish to report just the main basic concepts of complex networks. The study started from the concept of *random graph*s proposed in a milestone paper in 1960 by the Hungarian mathematicians P. Erdos and A. Renyi. The concept of graph (also directed and weighted) is explained in Figure 1. Today, we use the Erdos–Renyi (ER) random graph as a kind of benchmark—to compare with non-random graphs. An historical timeline of significant events in network science can be found in the novel book of T. Lewis.

In the late 1960s and 1970s graph theory was used by social scientists to model social networks and study the behaviour of humans in groups. Stanley Milgram is credited with introducing the notion of a small-world network to the social science

community. Milgram's famous "six degrees of separation" experiment suggested that the distance between two people selected at random from the entire population of the United States is approximately six intermediaries.

In the late 1990s, a number of scientists in other fields began to use networks as models of physical and biological phenomena. In particular, the pioneering work of D. Watts, S. Strogatz, and A.-L. Barabasi stimulated renewed interest in the theoretical analysis of the networks. Watts equated the structure of very sparse networks with small diameter (*small worlds*) with a diverse number of phenomena such as phase transitions in materials, evolution and metabolism of biological organisms, and distribution of energy in electrical power grids.

How could a simple graph model explain such diversity of real-world behaviours?

Strogatz studied the impact of network structure on complex adaptive systems in physics as well as explaining why hearts beat in a regular synchronized pattern in mammals, and why a certain species of firefly rhythmically synchronize their

chirps in unison without centralized control. It appeared that living organisms tend to synchronize their behaviour without global rules, but in an *emergent* way. Synchronization is a by-product of the structure of "living networks."

Barabasi introduced the concept of *scale-free* networks, there can be defined a kind of non-random networks with hubs. In a number of studies of the structure of the Internet and WWW, Barabasi et al. discovered an emergent property of the decentralized Internet, that means that it had emerged without central planning into a structure consisting of a small number of extremely popular sites called hubs.

Instead of being random, like an ER (Erdos–Renyi) network, the Internet topology was highly non-random. In fact, the probability that a site has k links obeys a power law, which drops off quickly for large k. Furthermore, they speculated that this was the result of a rule of growth and evolution of the underlying graph which was named preferential attachment, meaning that the probability a site will obtain a new link is directly proportional to the number of links it already has. Thus, the more links a site has, the more it gets, the so-called "rich get richer" phenomenon.

In the following sub-sections, we shall give some relevant additional element needed to understand the concept of scale-free networks and the dynamical phenomena of robustness, fragility and synchronization.

2.1 Some Basic Concepts

Although many definitions of complex networks have been proposed and deeply investigated in the last decades, three major concepts, namely, the *average path length*, the *clustering coefficient*, and the *degree distribution*, play a key role in the recent developments and achievements of complex networks theory. In fact, the original attempt of Watts and Strogatz in their work on *small-world* networks, was to construct a network model with *small* average path length as a random graph and relatively *large* clustering coefficient as a regular lattice, which evolved to become a new network model. On the other hand, the discovery of *scale-free* networks was based on the observation that the degree distributions of many real networks have a power-law form, although power-law distributions have been largely known for a long time in physics, for many other systems and processes.

2.1.1 Average Path Length

In a network, the distance d_{ij} between two nodes, labelled i and j respectively, is defined as the number of edges along the shortest path connecting them. The *diameter D* of a network, therefore, is defined to be the maximal distance among all distances between any pair of nodes in the network. Accordingly, the *average path length L* of the network is defined as the mean distance between two nodes, averaged over all pairs of nodes. Here, L determines the effective "size" of a network, the most typical separation of one pair of nodes therein. In a friendship network, for instance, L is the average number of friends existing in the shortest chain connecting two persons in the network. It was an interesting discovery that the average path length of most real complex networks is relatively small, even in those cases where these kinds of networks have many fewer edges than a typical globally coupled network with a equal number of nodes. This is reported as the *small-world effect*, hence the name of *small-world* networks.

2.1.2 Clustering Coefficient

If we analyse a *social network*, it is expected that your friend's friend is also your direct friend; namely, two of your friends are quite possibly friends of each other. This property refers to the *clustering* of the network. More precisely, one

can define a *clustering coefficient C* (also known as *Cluster Index*) as the average fraction of pairs of neighbours of a node that are also neighbours of each other. Suppose that a node *i* in the network has k_i edges and they connect this node to k_i other nodes. These nodes are all neighbours of node *i*. Clearly, at most $k_i\ (k_i - 1)/2$ edges can exist among them, and this occurs when every neighbour of node *i* connected to every other neighbour of node *i*. The clustering coefficient *Ci* of node *i* is then defined as the ratio between the number *Ei* of edges that actually exist among these k_i nodes and the total possible number $k_i\ (k_i - 1)/2$, namely, $Ci = 2Ei/(k_i\ (k_i - 1))$. The clustering coefficient *C* of the whole network is the average of *Ci* over all *i*. Clearly, $C \leq 1$, and $C = 1$ implies that the network is globally coupled, which means that every node in the network connects to every other node. In a completely random network consisting of *N* nodes, *C* is proportional to $1/N$, which is very small as compared to most real networks. It has been found that most large-scale real networks have a tendency toward clustering, in the sense that their clustering coefficients are much greater than $O(1/N)$, although they are still significantly less than one (namely, far away from being globally connected). This, in turn, means that most real complex networks are not completely random.

2.1.3 Degree Distribution

The simplest and perhaps also the most important characteristic of a single node is its *degree*. The degree k_i of a node *i* is usually defined to be the total number of its connections. Accordingly, the larger the degree, the "more important" the node is in a network. The average of k_i over all *i* is called the *average degree* of the network, and is denoted by $< k >$. The spread of node degrees over a network is characterized by a distribution function *P(k)*, which is the probability that a randomly selected node has exactly *k* edges. A regular lattice has a simple degree sequence because all the nodes have the same number of edges; and so a plot of the degree distribution contains a single sharp spike (delta distribution). Any randomness in the network will broaden the shape of this peak. In the limiting case of a completely random network, the degree sequence obeys the familiar Poisson distribution; and the shape of the Poisson distribution falls off exponentially, away from the peak value $< k >$. Because of this exponential decline, the probability of finding a node with *k* edges becomes negligibly small for $k >> < k >$. In the past few years, many empirical results showed that for most large-scale real networks the degree distribution deviates significantly from the Poisson distribution. In particular, for a number of networks, the degree distribution can be better described by a *power-law* of the form $P(k) \sim k^{-\gamma}$ (typically, the exponent $2<\gamma<3$). This power-law distribution falls off more gradually than an exponential one, allowing for a few nodes of very large degree to exist. Figure 1 shows the difference existing between a power-law and an exponential distribution: the power-law distribution has a heavy tail. Because these power-laws are free of any characteristic scale, such a network with a power-law degree distribution is called a *scale-free network*. In non-mathematical terms, a scale-free network is one with a small number of nodes showing a high-degree and a a large number of nodes with low-degree. The rare nodes with high degree are called *hubs*; therefore, *scale-free* networks are networks with hubs, which results in a skewed degree sequence distribution. The small-world and scale-free features are common to many real-world complex networks.

Many networks have a *community* structure, in that case nodes are linked together in densely connected groups between which connections are sparser.

2.1.4 Special properties of Complex Networks

Apart from the concept of evolution of networks that strongly differentiate the analysed models from standard static networks, the discussed topologies have some relevant properties. The SF networks are robust to avoid a malfunctioning when a fraction of its components is damaged. This property largely affects the efficiency of any process running on the

network. Figure 3.1 describes the different abilities of ER random graphs and BA scale-free models with respect to this property.

3. Network Economy

Recently, the huge growth of interest and the renaissance of the studies on networks and graphs motivated new findings about the power of networks in Economy from the organization of companies to marketing. The main example proposed by Barabasi [1] in his fundamental book, regards the formation of a sparse network of a few powerful managers controlling all major appointments in Fortune 1000 companies. The growth of a network of alliances is the basis of success in the biotech industry, the structure and the underlying topology of the network is the key to gain an organization's ability to adapt to rapidly changing market conditions. Also, the ideation of strategies based on the essence of complex networks can lead to unpredictable successes in marketing. In other word, understanding the network effects, in terms of dynamical growth and preferential attachments to hubs is needed to guarantee a survival in the new economy evolution.

The standard organization of firms was long time based on a hierarchical structure, i.e. a tree with decreasing responsibility levels starting from the root till the final executors of orders derived from them. The tasks of manager were non-overlapping and the work became specialized through the bifurcating branches. The structure of tree shows problems in terms of information flow that should be properly filtered in order to avoid overload in inappropriate branches; however, the main limitation stems from the rigidity of the organization which can be very stiff: each possible problem and/or implemented modification in the productive cycle could strongly impact on all levels of the tree generating shut down and inability to recovery and to adapt to changing environment. Finally, the firm's model relying on hierarchy is best suited for mass production, where, in a sense, the hardware continuously improved is the main productive factor. Today, in the information era, the assets are more volatile and based on ideas, exchange of information and preparation for change. Flexibility of organization calls for a rethinking of the entire structure for facing the requests of the information economy. For example, this gives rise to outsourcing, i.e. renouncing possibly to the industrial secrets and giving out some manufacturing parts of the production cycle. The major step of the organizational change is the shift from a tree to a network structure: the hallmark of the graph topology are the web-map of directed links between the nodes. Sometimes, the integration is virtual and the reach of business expands from local (domestic) to global (worldwide). The invasion of new markets with novel products requires both a political level of interactions among integrated countries (like European Union) and new alliances between firms apart from internal parts of the same company. In short, companies change their organization to survive in a fast changing economic world from the optimized tree where each actor has a specific, truly specialized, role to a dynamic and continuously evolving, more flexible structure. A strong consequence of this novel approach to market is the search for collaborations with other institutions, for example by inclusions of the top managers in other organizations' board of directors. The interactions are the effect of the network structure. A short group of top managers is involved in several boards taking decisions in important steps for companies' future, like merging, fusions, and acquisitions. In the network generated by the directors, each node is a member of the boards linked to other directors: being thousands of firms so linked through their directors, the result is a complex web of relationships with the character of a *small-world* network due to a limited but not to be neglected number of directors who serve on several boards. According to Barabasi [ref], with reference to the network of Fortune 1000 companies, made up of 10,100 directorships held by 7,682 directors, well 14 percent of directors serve on two boards and about 7 percent serve on three or more. The resulting 21 percent of directors implement a small-world network with five

degrees of separation. These intricate relationships among board directors form the underlying topology of the economic network, however, to really gain insights into the dynamics develop, it is needed to explain the interactions among agents. The alliances among corporations make the network emerge: some companies are related through a high level of connectedness that is not possible to achieve in both random and small-world networks. In these kind of networks, some nodes work as hubs, which are responsible for leaving the complex network connected, these are companies with a large number of partnerships. Through the hubs, like in a network of airports, it is possible for not directly connected nodes to maintain relationships. In particular, for the biotech industries, dynamically related by exchanging knowledge and patents in R&D partnerships, it was shown that the evolution of the network is ruled by a *scale-free* scheme. This means that the number of companies that entered in collaboration with exactly k other firms, representing the number of links they form in the network, followed a *power-law*, the main property of a *scale-free* network. In the case of sports like football, the scheme is not so different: we have a group of well-connected large societies that work as hubs for a large number of small societies, all of them integrated into an evolving *scale-free* network. This topological structure works well in normal times, but is strategic during and by recovering from crisis. One of the characteristic of football societies is that the alliances are fluid, periodically renegotiated as the consumer interests and the evolving marketplace shift: we can use this case as a paradigm of future worldwide network economy. It is quite strange that these obvious network effects are neglected from economic theory. In the standard formal model, the economy is seen as the result of the interaction of anonymous individuals through the price system: in this framework, the actions taken by the individual agent (companies and consumers) have little consequence on the global market. Actually, the market is by itself a network where companies, firms and institutions are the nodes and the interaction among the agents are the link (or branches) of the underlying graph. What's more interesting in the network economy is that the (directed) links are weighted through a sort of "value" of the transaction. The formal model for studying the evolution of the network is not a binary one, but a real network displaying a large heterogeneity in the capacity and the intensity of the connections. For example, in social networks, the weights are represented by the existence of weak and/or strong ties between individuals. A weighted network is a network in which each link carries a numerical value measuring the strength of connection. It comes out that the a weighted network has a special propensity for synchronization, i.e. the presence of weighted connections has relevant consequences in determining the network's dynamics.

Several authors studied how the presence of weighted connections can enhance the propensity to synchronize [Ref]. It has been shown that this can be reached by making use of the information contained in the global topology. The main idea is to scale the coupling strength between two nodes to the load of the edge connecting them. The load l_{ij} of the link connecting nodes i and j is a measure of the traffic of shortest paths including that link. This can be interpreted as a measure of the network structure at a global scale. By counting the number $n(i, j)$ of the shortest paths connecting the nodes i and j for all the couple of nodes in the network, one can scale the load by $1/n$, this way associating to the load distribution the information on the network structure of pathways at a global level: indeed, the value of each load l_{ij} can be influenced also by pairs of nodes that are far away from the nodes i and j. This procedure of weighting does not use the information on the node degrees since nodes with high degrees can have links with low load and, on the contrary, nodes with low degree may be linked by connections with high load.

It was shown [Ref] that for networks weighted based on link load the propensity for synchronization is by far improved with respect to weighting procedure based on the node degree distribution. This is particularly true for *scale-free* topologies. In the network economy, by consequence, the synchrony effect is favoured and could give rise to catastrophic

failures, as reported by Barabasi [Ref] with reference to the case of the cascading failures of companies and financial institutions in Thailand, Indonesia, Malaysia, Korea ant the Philippines starting from the failure of Somprasong Land, a Thai property development company, on February 5, 1997. The Asian crisis was a large-scale example of a cascading financial failure: these kind of events cannot be interpreted within the framework of the standard market model, but they are direct consequence of the interdependencies generated in an economy network-structured. Understanding these events can help to limit future crisis, by some anticipated intervention on the nodes and the paths of the damage.

4. Crisis in the framework of Complex Networks

The economic crisis we are facing today is paradigmatic of a critical need for a deep understanding of the topological structure and dynamics of economic networks and of the importance of novel investigation on these topics. Economic systems are increasingly built on interdependencies, implemented through trans-national credit and investment networks, trade relations, or supply chains that have proven difficult to predict and control [Ref]. As clarified in the previous Section, it is needed an approach that may highlight the systemic level and complexity of economic networks that should drive novel researches and paradigmatic developments in the economic theory. This is a privileged way to facilitate the future strategis and policies in order to reduce conflicts between individual interests and global efficiency: the prize to win is a reduced systemic risk of global failure and, thus, the gain in robustness of economic networks. Indeed, the current crisis is hardly predictable by considering the failure of a few relevant agents. The current view is to relate the system's dynamics to the topological properties of the underlying complex network. The two approaches to the studies of economic networks can be resumed as follows: i) a molecular level, in which the focus is on individual agents and the map of their relationships; ii) a macro-level, where the perspective looks to some statistical regularities of the network considered as a whole. Both the approaches have some advantages and disadvantages: at a molecular level, we emphasize the incentives of agents in developing links within nodes, this way failing to understand the global dynamics; at the macro-level, we can learn the large-scale properties of the network at the cost of losing the effective impact of individual agents.

To prevent the onset of crisis it is now clear that it is mandatory to gain a deep understanding of not only the dynamics that originate the real economic complex networks but also the evolution at the two-scale level (individual agents- global network) assuming nodes heterogeneity and weighted links (in terms not only of hubs structure and co-operation but also of loads and low probabilities interactions). In fact, as reported in [Ref], heterogeneities of agents can give rise to dynamics of the networks that prevent phase transitions, in this way introducing a source of unexpected stability. In times of crisis an order parameter of network dynamics is the individual search for efficiency, conflicting with aggregate welfare. The environmental volatility due for example to individual governs ephemeral actions, like temporary incentives to some kind of firms, or to innovation in the productive cycles can strongly reduce the network efficiency measured on the basis of the aggregate centrality of agents. The environmental volatility implies that when a single agent is exposed to an exogenous shock, it may force the deletion of links. If the environmental volatility grows up at a critical level, the network structure is subject to changes and breaks down into a sparse one, thus reducing the global efficiency. If a node fail, it may induce cascading failure, as previously argued, thus generating the systemic risk. This is certainly the case of football societies, where links represent debts and credits spread over multiple years between linked clubs. In general, a strongly connected networks can more easily compensate for individual failures by forcing diversification; however, this is not true for the failure of a few hubs or the deletion of links with heavy load. Since the removal of group of nodes may result in obtaining less stable networks, it seems that the *scale-free* structure is best suited to prevent cascading crashes.

5. Sport: a network of societies and consumers

Sport events as a social phenomenon per se and as an interesting research topic have gained increased popularity during nineties. Sports, as a leisure activity and, in particular, sports at a professional level, have grown into an industry sector of their own: one key example of the increased popularity is the emergent development of sports hall of fame and museum complexes all over the world. The sport industry, including sport events management, can be nowadays regarded as an important and relevant part of the more general entertainment business.

Sport (football) societies tend currently to make partnership to maximize the global utility (in terms not only of direct money income, like TV revenues and ticket costs, but also of increment of players' value, society marketing initiatives and other somehow related financial and commercial activities of the top management). In the recent literature, scientific results can be found in terms of both modelling of networks of collaborative agents that maximize the total profit (efficiency of the network) and the cost of adding and deleting topological nodes. It has been shown that this process can drive the network to multiple stable states (dynamic evolution analysis) and there is a relevant interest in trading-off network stability and efficiency.

In football, like in the economic networks we described in previous Sections, the societies network show the characteristic fat-tail behaviour of *scale-free* networks, which suggests that only a limited number of top societies (in Italy, for example Inter, Milan, Juventus; in Spain, Barcelona and Real Madrid) interact with many others, also outside the country. The big societies form clusters and they are the hubs of the complex network. Here, the links are weighted because of the level of economic interactions under consideration (think, as an example, to the financial trade of changing the top player Ibrahimovic and Eto'o, between Barcelona and Inter, in the summer 2009). The weights of the links implies that it is not only important to know if a link between two societies does exist, but it represent, for example, traded volumes, invested capitals, and so on. The evolution of the resulting network different at all, as we have discussed, not only in terms of growth and dynamical paths, but what's more, in terms of stability and propensity to synchronization. Definitely, the model we are building strongly affects the onset of cascading failures and, at the same time, the success in avoiding the impact of crisis and the ability to recovery from it.

In the football framework, there are some well-known financial problems that we should look following the complex network approach we are suggesting in this paper. TV revenues are one of the main financial income for societies. Here the network effect can be easily understood: it is clear that top club gain most of the money income from TV, but without small clubs there are no TV game diffusion.

This is simply stated in the fundamental Neale's paper [Ref], through the "Louis Schmelling Paradox" referring to the boxer Joe Louis whose earning were higher if there was an evenly matched contender available for him to fight than if the nearest contender was relatively weak. In professional sport the monopoly is less profitable than competition: the football team is a firm that aims to improve the profits, however, it has to share the market with other teams that co-operate with each other to produce a viable league competition.

Contracts of top players for advertising could in part help to mitigate this effect: part of the money for funding players wages can derive from non-football companies that wish to ad their products through the image of top players. Players' wages and transfer fees increases is another aspect to be analysed. Till some years ago, there was a wage inflation and a sudden increase trend in the top players' wages. This implies limited investment in small societies of lower divisions.

This generates not only controversies in the relationships within League's organizing body, but a weakness of the nodes less linked and a reduction of investment in the young players (minor) teams. In European countries, football teams used to spend in advance the money supposed to come from future revenues. On the other hand, the balance sheets are mostly based on intangible fixed assets, that are, by their very nature, mostly volatile. For example, it is not possible to guarantee that the cost of a top player does not decline in future years, since it depends on the market conditions. Also, the TV revenues could change, because of financial world crisis, the team could be relegated to Second Division, and so on. Furthermore, the total debt of most clubs is increasing. In summary, there is a condition of unstable financial equilibrium that could be well understood in order to avoid cascading failures. We have seen that the environmental volatility strongly impact on network's efficiency and that after a threshold value the network structure can face a breakdown effect. If some clubs should not survive to crisis, being exposed to exogenous shocks, in the network model we shall have the deletion of nodes and links. The ephemerality of the value of players, the proportional reduction of tangible fixed assets and the out-of-equilibrium state of some agents (clubs) due to balance sheets weaknesses going towards bankruptcy condition reduce the performance of the network as a whole. Big societies search for a community of alliances with other big clubs to prevent collapses: unfortunately the formation of communities (groups of nodes such that there is a higher density of edges within groups than between them) cannot help stability. The above discussed *scale-free* structure appears a more appropriate schemes to improve robustness (i.e., the ability of the network to avoid failures when a fraction of its constituents is damaged) in a systems where deliberate attacks to nodes are not predictable.

Finally, spending the future income and the structural weakness of club's balance sheets can strongly impact the equilibrium of the networks and generate a route to phase transitions, instability and cascading failures.

6. To escape from crisis

In conclusion, it seems clear that a strong effort should be made in better understanding both the dynamic of formation of networks, through nodes attachment and deletion, and the role of network topology in determining paths to synchrony and, thus, economic crisis. It is important to clarify that the knowledge of complex network in economy can yield suggestions in order (a) to favour the emergence of more stable and robust networks, (b) to anticipate the onset of cascading failures also motivated by exogenous triggers, like financial crisis; (c) to recovery from crisis by a dynamic reconfiguration of the underlying graph implying the knowledge of the way topology and dynamic evolution interact. The football societies network could present a scale-free structure governed by power-law scaling, due to the evidence of hubs (great clubs, like Barcelona, real Madrid, Inter, Milan, Chelsea, Manchester United) in different countries. In fact. there is an exchange of players between top clubs and smaller ones in different countries and the number of interactions is growing continuously. The network we analyse is certainly weighted and includes lot of cycles and motifs, thus the propensity to synchronization effects should be deeply investigated (the comparison with cortical network generating hyper-synchronous behaviour driving to epileptic seizures is structurally confirmed). It is clear that an effort should be made to obtain more and better quality data in order to simulate the behaviour of large-scale economic networks: the definition and generation of properly designed databases reflecting clubs interactions and network properties is to be fostered.

7. Conclusions

In this earlier version of the paper, we have proposed a critical reading of the financial-economic crisis on the structured economic networks. The analysis of sport societies, in particular football ones, can be considered as a paradigmatic case-

study for the analysis of the impact of both topology and dynamic interactions among nodes in a network of agents that represent the clubs interacting through competitions and leagues organizations. The model of weighted complex networks has been considered as the most relevant one in order to both understanding the genesis of crisis and cascading failures of nodes and finding suitable ways to reduce the impact of the crisis or to prevent it. A comparison is proposed with the cortical (neuronal) networks in the brain, with particular reference to the hyper-synchronization of sub-networks that generate the epileptic seizures. The paroxysmal activity may be localized or spread by going through cascading failures. The resetting of the previous state and, thus, the restoring of normal brain activity is seen as a dynamical process that emerge on the underlying topology of involved network of networks. Similarly, the collapse of an economic network could be predicted and mitigated by an accurate description of the weighted complex network. In that case, it is possible to early recovery from crisis by a dynamic redistribution of the network load and flow. The case of football teams interacting in a very special example of economic network, subject to decisions which are taken and implemented collectively at league level, by eliminating geographic boundaries and limitations.

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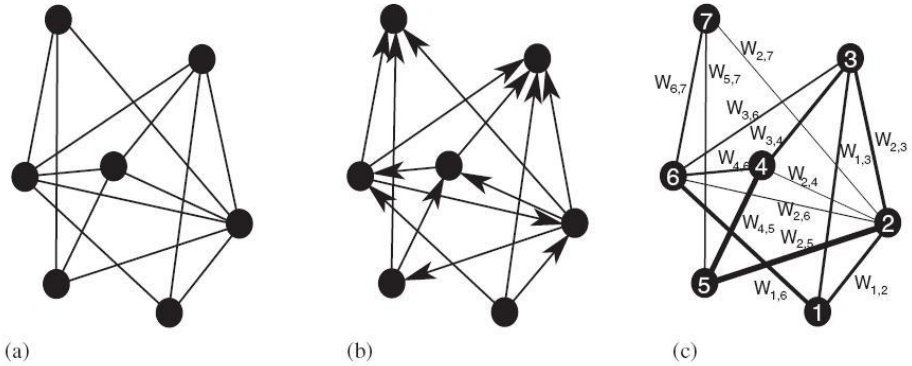

Figure 1 – Undirected (a), directed (b) and weighted undirected (c) graph with N=7 nodes and K=14 links. In directed graphs, adjacent nodes are connected by arrows, connecting a source and a sink nodes. In the weighted graph, the w quantities indicate the intensity of the connection, represented by the thickness of the link. From S. Boccaletti et al., Physic reports, Vol. 424, 2006

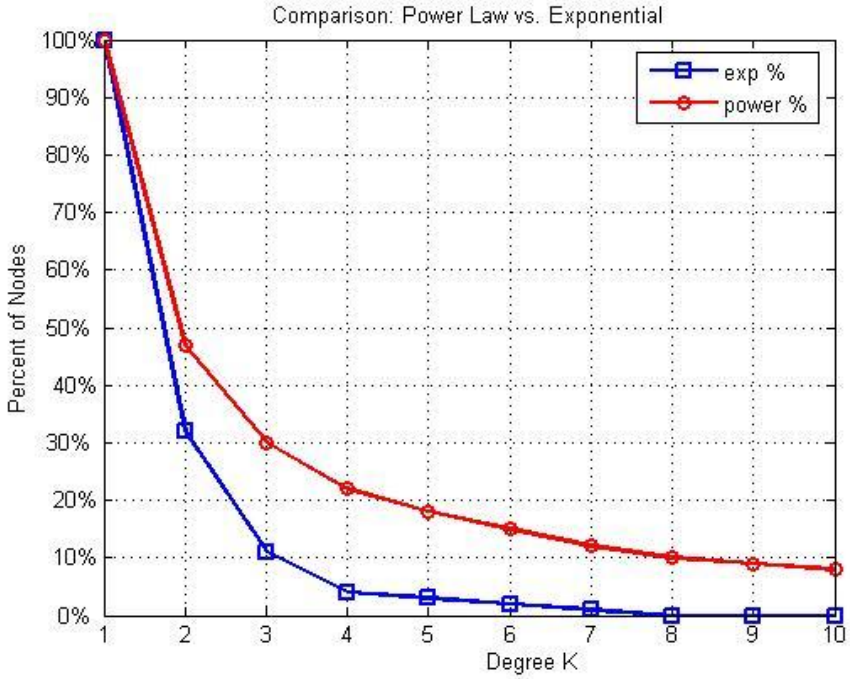

Figure 2 – Nodes with Degree k, in percent, versus the Degree k for Random and Scale-Free Graphs (power-law distribution). The SF networks includes some hubs nodes with a very high number of links, although most nodes have just a few connections. If plotted in a double-logarithmic scale, the distribution of nodes results in a straight line.

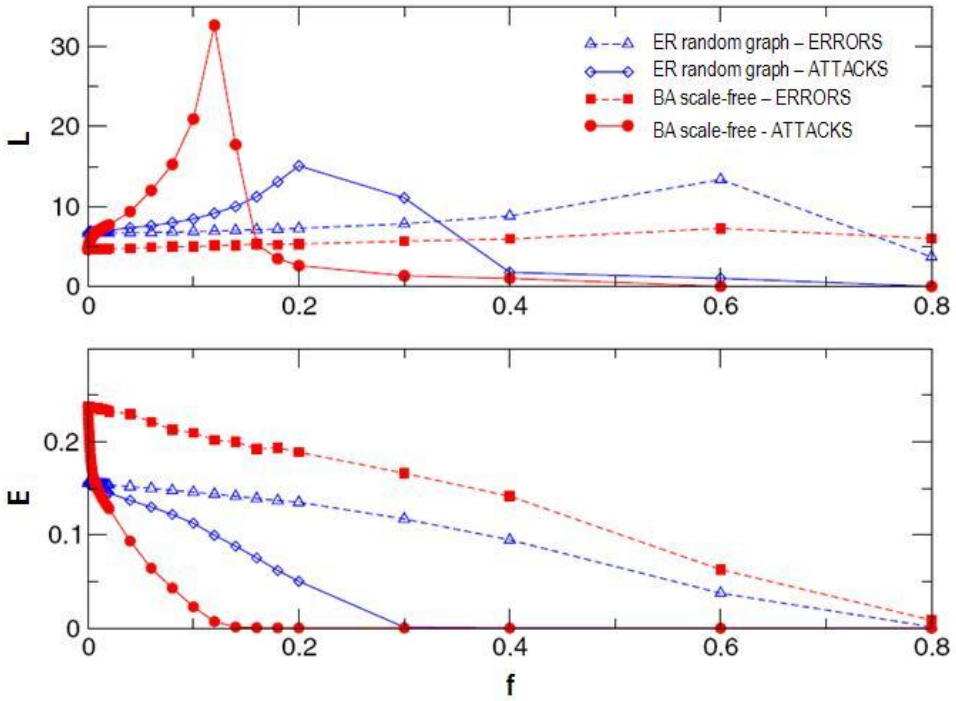

Figure 3 – Robustness of the network under random failures and attacks on nodes. The average shortest path length L and global efficiency E are reported as a function of the fraction of removed nodes f. An ER random graph and a scale-free network,

both with N=5000 and K=10,000 are considered. From P.Crucitti et al, Physica A Vol.320, p.622, 2003

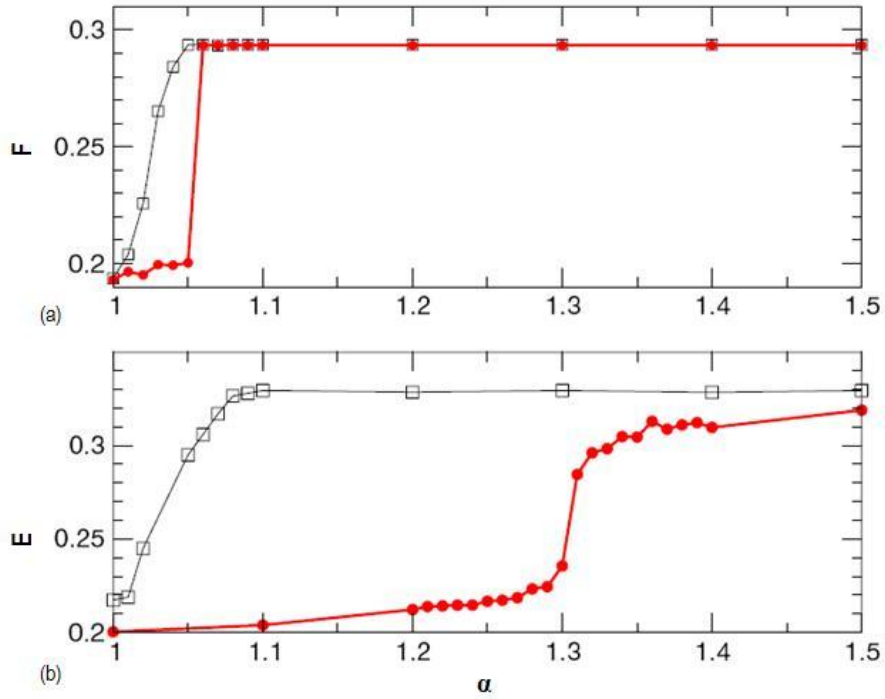

Figure 4 – Cascading failures in (a) ER random graph and (b) scale-free network as triggered by the removal of a node chosen at random (squares), or by removal of the node with largest load (circles). Both the networks considered have N=2000 and K=10,000. the efficiency, E, of the network is reported as a function of the tolerance parameter αIn the case triggered by the removal of a node chosen at random the curve corresponds to an average of 10 triggers. From P.Crucitti et al, Phys. Rev.- E 69, 04510 (R), 2004.

Session 3: MANAGEMENT IN FRONT OF THE CRISIS

Chairman: Anna Maria Gil (Real Academia de Doctores, Spain)

- ***The Impact of the Global Financial Crisis on Sport in North America***
  Brad Humphreys
  Professor of Economics of Gaming, Universidad de Illinois, USA

- ***General Principles for Real Options applied to Professional Football Player Valuation***
  José Luis Sánchez Fernández de Valderrama
  Professor of Financial Economics and Accounting, Universidad Complutense de Madrid, Spain.

- ***Governance and Sporting Success of Top20 Football Clubs after Economic Crisis***
  Domenico Marino
  Físico Nuclear, Università Mediterránea di Reggio Calabria, Italy

The Impact of the Global Financial Crisis on Sport in North America

Brad R. Humphreys (USA)

Abstract: Beginning in early 2007 the global economy entered into a tumultuous period of contraction in real economic activity and disruption in financial markets. This paper explores the effect of the recession and financial crisis that began in mid 2007 on professional sports leagues in North America. While attendance and franchise values declined slightly, and a few teams experienced financial problems, the nature of the sport product and institutional factors associated with the sports industry have, so far, insulted professional sport from significant negative impacts. Structural change in lending may have an impact on new facility construction in the long run. The increasing reliance on revenues from businesses in the form of premium seats, luxury suites, and sponsorship may lead to future problems if the downturn continues for a prolonged period.

JEL Codes: E32, G01, L83

Key Words: recession, financial crisis, professional sports, attendance, franchise value

Introduction

The global economy experienced an extraordinary sequence of economic and financial problems beginning in early 2007. Economies around the globe contracted as real and financial markets simultaneously dropped. The size and duration of this contraction has not been matched since the early part of the 20th century. The economic and financial crisis affected all sectors of the economy; employment, household income, industrial production, and retail sales have all declined significantly since the business cycle peak in mid 2007. In addition, financial institutions failed at alarming rates, and the prices of securities traded on stock markets fell sharply world wide. The impact of these economic and financial problems on certain sectors of the economy, like the labor market, commercial banking, central banking, and stock markets, have been widely documented and analyzed. Here, I assess the impact of the recent economic and financial turmoil on professional sports leagues in North America.

Sports leagues have a different organizational form, operating methods, goals, and institutional characteristics than firms in other sectors of the economy, so there is good reason to expect them to react differently to economic and financial downturns than other firms. North American professional sports leagues also differ from European sports leagues in a number of important ways that also contribute to a different reaction to economic turmoil. I begin with a discussion of the unique economic characteristics of professional sport, and then describe the economic and financial characteristics of professional sports leagues in North America. After documenting the size and scope of the economic and financial crisis, I explore the ramifications for teams in the National Football League, National Basketball Association, National Hockey League, and Major League Baseball, and briefly touch on the impact on Major League Soccer.

The evidence suggests that attendance, a key source of revenue in professional sports leagues, responded to changes in the business cycle in the past, implying that revenues from ticket sales and other game day revenue streams like concessions and parking may decline. Anecdotal evidence indicates sales of premium seats and luxury suites may decline more because the businesses who buy these relatively expensive products have experienced sharp declines in revenues. Television viewing, another key source of revenues for professional sports leagues, has not declined during the downturn, and most of the revenues earned from broadcast rights come from long term contracts that will not expire until 2012 or beyond; these revenue streams are unlikely to decline in the short or medium term. The disruption of credit flows due to the financial crisis may affect future sports facility renovation and construction projects, which require access to capital markets to complete.

The Professional Sports Industry in Context

Determinants of Demand for Professional Sports

In economic terms, sporting events are entertainment goods that are produced by teams and leagues and purchased by households and businesses. Borland and Macdonald (2003) define the product produced by sports teams as games or contests between two teams and the product produced by leagues as the annual regular season and post season competitions for the league championship. Borland and Macdonald (2003) identify two types of demand for sport: direct demand based on live attendance at sporting events and derived demand based on mediated viewing of sports and the purchase of related goods like merchandise bearing team names or logos.

Borland and Macdonald (2003) also discuss four different factors affecting demand for sporting events: consumer preferences, economic factors, quality of viewing, and the nature of the contest or event. Consumer preferences affect demand for all goods and services in a fundamental way. Consumer preferences for sporting events, however, are in many ways more complex than preferences for other goods or services, because, unlike preferences about consumer necessities like housing or food, consumers' preferences for sporting events depend on phenomena like habit formation, conspicuous consumption, and bandwagon effects that may alter preferences over time. The economic factors affecting demand for sport are similar to hose affecting demand for other goods and services. The price of attending or watching a sporting event, the price of substitute activities, the opportunity cost of time, income, and macroeconomic factors like the unemployment rate all affect direct and indirect demand for sporting events in much the same way that they affect demand for television sets or mp3 files. The quality of viewing sports depends on environmental factors like weather, temporal factors like the day and time of the sporting event, as well as the facility and the amenities at the facility (sight lines, concession stands, scoreboards, etc.). The nature of the contest or event depends on the relative quality of the two teams involved and uncertainty about the outcome of the event as perceived by buyers. Generally, contests with greater uncertainty of outcome will generate greater direct and induced demand than contests with a lesser degree of uncertainty of outcome, at both the match and season level.

Many of the factors that affect direct and induced demand for sporting events will not be affected much by the current economic and financial crisis. For example, the relative quality of teams, environmental factors like the weather, and temporal factors related to day and time of games played should all be relatively insensitive to the economic and financial climate in the general economy. In addition, uncertainty about the outcome of games or seasons, identified as an important component of direct and induced demand for sporting events, should be entirely unaffected by general economic and financial conditions in the economy. Much of the core of the sports product, and many of the factors that affect direct and induced demand for sports events, should lie outside the influence of the business cycle and any turmoil in financial markets.

North American Professional Sports Leagues

North American professional sports leagues differ from European leagues in a number of important ways, including the revenue sources, roster sizes, league composition, championship determination, and the methods of allocating players to teams and player compensation. In order to understand the effect of the financial and economic crisis on professional sports in North America, it is important to understand the differences in leagues and league structure.

League Structure

There are five major professional sports leagues in North America: Major League Baseball (MLB), the National Football League(NFL), the National Basketball Association (NBA), the National Hockey League (NHL), and Major League Soccer (MLS). Although some might argue that MLS does not constitute a "major" professional sports league, I include MLS in this description because it is comparable to the most popular European professional sports leagues in terms of the sport played, the sport called soccer in North America and football in the rest of the world. There are also a large number of minor professional leagues in North America in these five sports, as well as in other sports like lacrosse. I restrict my analysis to only these five professional leagues because of a lack of financial and economic data from other leagues and because of the prominence of the NFL, MLB, NHL, and NBA in North America.

Professional sports leagues in North America are closed, static leagues. No system of promotion and relegation exists, so the composition of leagues does not change from season to season. The only change in the composition of the five major professional sports leagues occurs when the leagues periodically expand their membership. The NBA last expanded in 1995, adding two teams; the NFL last expanded in 1999, adding two teams; the NHL last expanded in 2000, adding two teams; MLB last expanded in 1998, adding two teams; MLS is the only league currently expanding, adding two teams in 2005, one team in 2007, and one team in 2009, and another new teams will be added in 2010.

All professional sports leagues in North America feature exclusive territorial agreements that divides the US and Canada up into distinct geographic areas where each team enjoys monopoly power, except in a few cases where two teams play in the same large metropolitan area like New York City, Chicago, Los Angeles and the San Francisco Bay area. This system works because leagues have implicit or explicit exemptions from anti-trust law and can operate as monopolies, completely controlling the number of teams in each league and the location of each team.

Governance and Team Ownership

Although each professional league in North America has a commissioner with nominal power to make league policy, the true power resides with the owners of the teams in each league. The league commissioners primarily handle the day-to-day operation of the league, enforce existing rules governing play, and act as a figurehead and spokesman. No multinational governing body like UEFA exists in North America, and individual teams have much more power than their European counterparts. This stems primarily from the static nature of North American leagues.

With very few exceptions, professional sports teams in North America are privately held businesses that do not issue shares on stock exchanges. None are operated by clubs or organizations of supporters, as is common in Europe. Because of this ownership structure, information about the financial condition of professional sports teams in North America is nonexistent. They are not obligated to release any audited financial data, and seldom open their books for inspection by outside parties. This lack of information makes it very difficult to assess the financial condition of these teams, including the effect of the business cycle on the financial health of teams.

The one exception in North America is MLS, which operates under a single-entity league structure. In MLS, all teams are centrally controlled by the league, revenues are shared across teams in the league, and players ultimately contract with the league, not with individual teams. However, MLS is also a privately held business and does not release financial information to the public.

On the player side, professional athletes in team sports in North America are all unionized. The National Football League Players' Association, the National Basketball Players' Association, the Major League Baseball Players Association, the National Hockey League Players' Association, and the major League Soccer Players Union represent players in the main professional leagues in North America. In all four leagues, a collective bargaining agreement (CBA) between the players' union and the league governs all aspects of the economic interaction between players and teams. CBAs typically last for five years and the re-negotiation of a CBA often leads to significant work stoppages in North American professional sports leagues. For example, the NHL lost the entire 2004-2005 season to a work stoppage, teams in the NBA played only 50 games, instead of the usual 82, in the 1998-1999 season because of a work stoppage, and MLB cancelled the last two months of the regular season and the entire post-season, including the World Series, in 1994 because of a work stoppage.

Revenues

Teams in North American sports leagues earn revenues from five broad sources: gate revenues from ticket sales, facility-based revenues from concessions, parking, local and national broadcast rights fees, and licensed merchandise sales revenues. Facility-based revenues depend primarily on attendance at games, since the more people attending games, the more money spent on these goods and services. Transfer fees do not exist in North American sports leagues, and some leagues prohibit that sale of players for cash. The relative contribution of each type of revenue differs across leagues, but in general, ticket sales and revenues related to attending games represents the largest source of revenues for professional sports teams in North America; media rights fees, including television and radio broadcast rights, represent the second largest source of revenues.

For most of the economic history of professional sports in North America, sales of tickets to individual fans, either in the form of "season ticket" packages to all home games, or tickets to individual games, represented the single largest source of revenues to professional sports teams. Beginning in the 1990s, teams began to generate significant revenues from premium seating, including luxury boxes and other "club seats" located in special sections of sports facilities separated from general admission seats (Mason and Howard, 2008). A new stadium or arena in North America typically contains between 70 and 140 luxury suites and several thousand premium seats. Tickets for seats in these premium locations typically cost two to four times more than other tickets and come with enhanced concessions and other amenities like personal television screens. Luxury suites must be leased for an entire season at an average price often exceeding $100,000, not including mandatory purchases of food and beverages at each game. The primary customers for premium seats and luxury suites are not individual fans; these seats are primarily sold to corporations and other businesses (Mason and Howard, 2008).

Another important source of revenues in professional sports in North America is sponsorship. In North American leagues, sponsorship revenue comes from facility naming rights fees, revenues from signage in sports facilities, and rights fees associated with product endorsements. Facility naming rights deals can be quite lucrative in North America. For example Reliant Energy paid $10 million per year for the naming rights to the stadium where the Houston Texans play football and Royal Phillips Electronics paid $9.3 million dollars per year for the naming rights to the arena where the Atlanta Thrashers HNL franchise and the Hawks NBA franchises play. Stadium signage rights fees are typically smaller. Product endorsement revenues come from sponsorship deals that make certain products the "official" product of some sports team or league. There are no jersey sponsorship deals in the NFL, NBA, MLB or NHL. Corporate advertising on jerseys is forbidden in these leagues at this time, unlike the current practice in Europe. O'Reilly and Nadeau (2006) document an increase in revenues from sponsorship in North American sports leagues over the past few decades.

Costs

Like professional sports teams all over the world, player compensation accounts for the largest operating expense incurred by teams in North American sports leagues. One unique feature of the payroll costs of North American sports leagues is the presence of salary caps that limit the total compensation paid to players in the league. The current collective bargaining agreements between players' unions and the NFL, NBA, NHL, and MLS include salary caps or other restrictions on player salaries. Only MLB does not have a formal salary cap in place at this time. Salary caps in North American sports leagues limit total payroll on each team to a specific fraction of total revenues earned by teams in

each season. New players are acquired either through amateur entry drafts that assign rights of new players to specific teams and limit salaries paid to these new players, through trades, or through free agent signings. There are almost no transfer fees in North American professional sports leagues. Players change teams through trades or free agency. The only exceptions are that professional baseball players moving from Japan to North America sometimes require the payment of a transfer fee to a Japanese team, and professional hockey players moving from European teams to NHL teams must require a $200,000 transfer fee be paid to the European club.

Professional athletes in North American leagues have limited free agency. In general, new players in leagues are assigned to teams through amateur entry drafts and the teams assigned the rights to these players can keep them under contract for a number of seasons before players can become free agents and sell their services to the highest bidder on the open market. MLB players can become free agents after playing 6 seasons, NBA players can become free agents after playing 3 or 4 seasons, NFL players can become free agents after playing 3 seasons, and NHL players can become free agents after playing seven seasons or turning 27 years of age. In addition, long term contracts, contracts of duration 3 or more years, are relatively common in North American Sports Leagues.

The existence of salary caps, limited free agency, and long-term contracts mean that payroll expenses are relatively stable in North American professional sports leagues. Salary caps place limits on the number of new players that can be acquired in any season, and the limited nature of free agency means that players with relatively little experience are paid low salaries. It also means that teams in financial difficulty cannot raise large sums of money quickly through transfer fees earned by selling off star players.

The Dimensions of the Financial and Economic Crisis in North America

The economies of the United States and Canada are in the midst of a significant economic downturn which began in 2007. This downturn can be described as a recession, a macroeconomic event characterized by a general downturn in economic activity over a sustained period of time. Recessions feature co-movement of most or all aggregate economic indicators, including employment, industrial production, sales, income, and household spending. This downturn affected both the real economy, reducing employment, industrial production, income, and consumer spending, and the financial sector, generating significant interruptions in the flow of capital and the ability of households and firms to borrow against future earnings. The events in the real economy and the financial sector are related, although the timing and extent of the downturn differ somewhat in these two areas. The decline in real economic activity in past recessions has been temporary – aggregate production, income, sales and employment have returned to their pre-recession long-run trends eventually, and sometimes rapidly. The financial consequences of this downturn may, on the other hand, feature important long-term permanent structural changes (Chari, Christiano, and Kehoe, 2008). Although the worst period of contraction appears to be over, economic conditions have not yet begun to improve, and many sectors of the economy may not recover for quite some time. Whenever this downturn ends, it will probably be the longest and deepest recession in the United States since World War II (Kliesen 2009).

The decline in real economic activity, like production and earnings, began in December 2007, when the NBER Business Cycle Dating Committee determined that the economy in the United States experienced a turning point, moving from expansion to recession. The NBER dating committee determines the precise point in time when the economy moved from expansion to contraction after a long period of deliberation and analysis. The December 2007 business cycle peak was announced on December 1 2008.

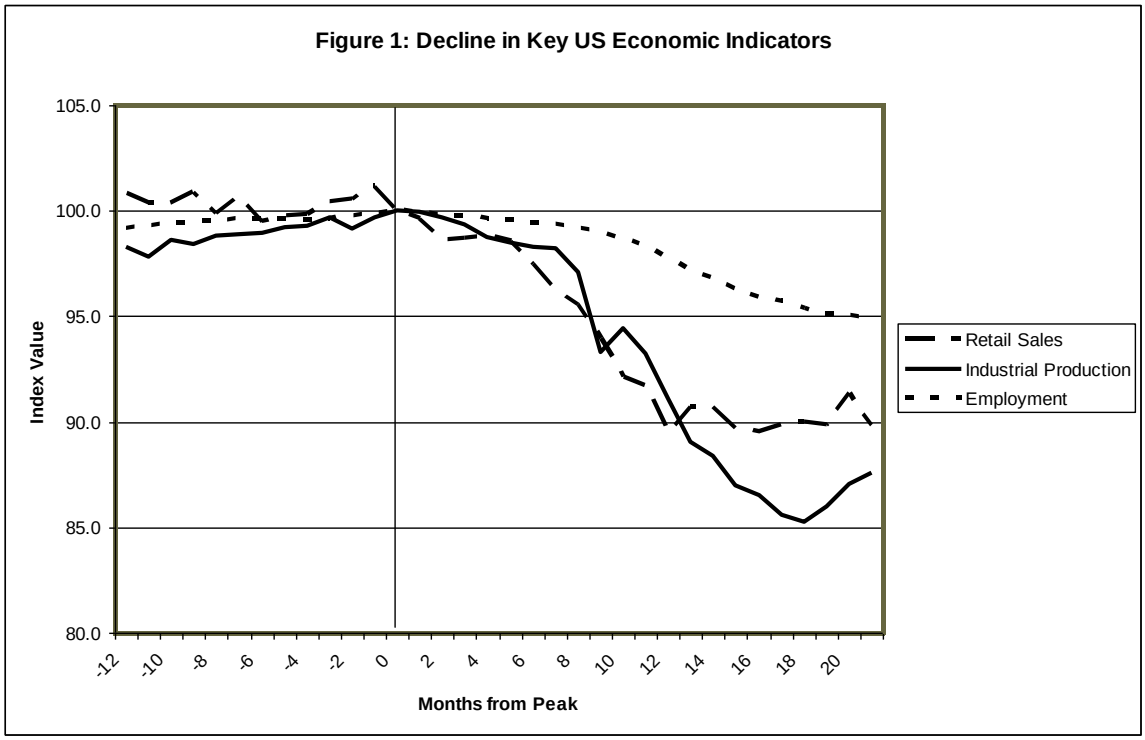

Figure 1 documents the decline in several key economic indicators for the US economy after the business cycle turning point in December 2007. Retail sales, defined as revenues earned by establishments that sell goods and services to households, employment, defined as the number of persons working, and industrial production, defined as the dollar value of goods produced, are considered important indicators of macroeconomic performance in developed economies. On Figure 1, the estimated monthly value of each of these three economic indicators was normalized to 100 in December 2007, which is represented by zero on the horizontal axis. Negative numbers on the horizontal axis refer to months before December 2007, and positive values to months after December 2007. Since the values of each variable have been normalized to 100, the percent decline in each variable can easily be read off of the vertical axis.

From Figure 1, retail sales, industrial production and employment all declined in the months following the December 2007 peak in the business cycle. The decline was small in the first few months, but picked up considerably in the summer of 2008, roughly six months after the peak. Industrial production and retail sales fell by more than employment in percentage terms. By the end of 2008 retail sales and industrial production had declined by 10% and employment by almost 5%. However, employment continued to decline two years after the peak, while retail sales and industrial production stabilized somewhat.

The decline in retail sales and industrial production are both important for understanding the effect of the current economic and financial crisis on professional sports leagues in North America. As discussed above, professional teams in North America have moved from a heavy reliance on consumer spending, in the form of single game and season ticket sales, concessions and other game day spending, and licensed merchandise for revenues to a much larger reliance on business spending for revenues. This business spending takes the form of premium seat and luxury box leases, facility naming rights, and other sponsorship revenues. The decline in retail sales and industrial production means that business revenues have fallen sharply since the start of the economic and financial crisis in 2007. Businesses have considerable flexibility in adjusting their expenditures, and as profit maximizing organizations, businesses will rapidly cut costs when faced with declining revenues in order to avoid losses. Businesses cut costs by laying off employees, and reducing

expenses on other inputs to production. Economic theory predicts that profit maximizing firms will reduce costs based on the marginal revenue product generated by each input. Spending by businesses on sports, in the form of premium seats, luxury suites, and sponsorship deals, are indirectly related to the production of output in most cases. The marginal revenue product of inputs indirectly related to production may be relatively low, implying that businesses will reduce spending on these inputs first. Businesses may drastically reduce spending on sports related inputs to production during an economic downturn.

These three economic indicators tell only part of the story of the decline in real economic activity after the December 2007 business cycle peak. The decline in employment also reflects significant declines in earnings for the households of unemployed workers. Since recessions feature co-movement of most economic variables, many additional economic variables also declined at about the same time, and by similar magnitudes.

The timing of the financial crisis is harder to determine exactly and the impact both wider and harder to assess. The first signal of an impending financial crisis in the US came in February, 2007, when the Federal Home Loan Mortgage Corporation ("Freddie Mac") announced that it would stop buying the most risky type of home mortgages, those falling in the "subprime" category, as well as any mortgage-related securities based on derivatives of these mortgages. Subprime mortgages refer to loans made to individuals with poor credit histories to purchase a home. In April 2007, New Century Financial Corporation, a large lender in the sub prime mortgage market, declared bankruptcy. By the end of 2007, the subprime mortgage problem had spread well beyond this relatively small area in the financial sector. Large financial institutions in the US and Europe began reporting large losses and, in short order, a credit crunch developed that featured reduced liquidity across the financial sector and limits on the flow of credit between financial institutions (Mizen, 2008).

The event that touched off the financial crisis, a sharp increase in defaults on subprime mortgages, was relatively small. Blanchard (2009) estimates that the value of losses on subprime loans and derivative securities based on subprime loans, was only $250 billion in the US as of October 2007. Unfortunately, structural factors in financial and housing markets rapidly amplified the subprime loan collapse. Blanchard (2009) estimates the worldwide loss in all financial markets (stocks, bonds, real estate) to be more than $26 trillion dollars, roughly 100 times the initial subprime mortgage losses. In addition, the financial crisis featured a dramatic decline in the flow of capital between lenders and from lenders to borrowers. Brunnermeier (2009) characterizes this as a liquidity squeeze where lenders fear for their future access to capital markets and begin hoarding funds.

The mechanisms through which the relatively small subprime loss were amplified are beyond the scope of this paper. The key is to understand the ramifications of the financial crisis for professional sports teams in North America. For North American professional sports teams, the key consequence of the financial crisis will be the extent to which access to borrowing, in the form of short term commercial paper, and long term debt to finance new facility construction and renovation, will be reduced. All businesses require some short term borrowing to smooth out temporal differences between revenues and expenses. For example, broadcast rights fees are paid out in lump sums and game day revenues are realized only during the season while salary expenses are monthly or bi-weekly; these temporal differences may require short term borrowing to meet payroll. Professional sports teams also must periodically replace or renovate stadiums and arenas and practice facilities. These expensive capital investment projects require borrowing against future revenues. The financial crisis will clearly bring about significant structural changes in the flow of capital from savers to

lenders to borrowers. Problem for professional sports teams will emerge in the long run if team's access to short and long term borrowing declines.

Impacts of the Financial and Economic Crisis

Attendance

General Admission

The response of attendance at professional sporting events to past economic downturns can shed light on the effect of the current economic and financial crisis on sports. The exact date of turning points in the business cycle have been determined by the National Bureau of Economic Research (NBER) in the US for each recession and expansion since the 1950s. The exact date of each turning point in the business cycle – a peak when the business cycle switches from expansion to recession and a trough when the business cycle switches from recession back to expansion – has been identified to the month by the NBER as part of the business cycle reference date project undertaken by the Business Cycle Dating Committee. These business cycle reference dates identify define the start and end of recessions and expansions with great precision in the US over a long period of time. Data on attendance at professional sporting events over long periods of time are, however, difficult to obtain for many professional leagues in North America. After considerable searching, I located data on total league attendance in each season in MLB from 1900 to 2008, in the NBA from 1949-2008, in the NHL from 1960 to 2008, and in the NFL from 1970 to 2008. However, total NFL attendance for 1992 and 1998 were not available.

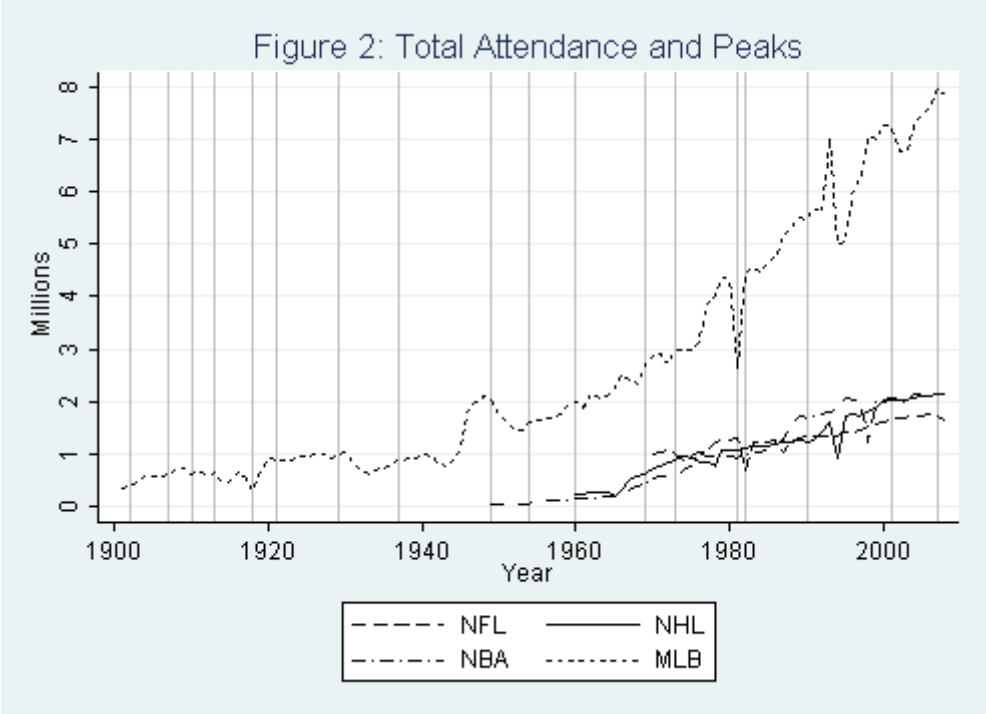

Figure 2 shows total attendance for each season in the NFL, NBA, MLB and NHL as well as the peak of the business cycle, over the past 100 years. Since only peaks of the business cycle are identified, the period between each vertical line on Figure 2 represents both a recession and the ensuing expansion. The average recession lasted 14 months and the average expansion lasted 44 months over this period. The annual attendance plots show a great deal of variation, in part

because of work stoppages and changes in the number of teams in each league and the number of games played in each season. Many of the large declines are associated with work stoppages that resulted in the cancellation of a significant number of games.

A careful examination of Figure 2 reveals some instances when total attendance appears to decline during recessions. For example, MLB and NFL attendance drops significantly in the early 1980s, when two recessions hit the US economy in January 1980 and July 1981. However, both leagues experienced work stoppages during this period, which may explain some of the decline in attendance. Also note that, based on Figure 2, MLB remains the most popular sport among these four in terms of attendance, and all four leagues have experienced significant growth in attendance over time.

Instead of relying on visual examination to understand the effect of recessions on attendance, I estimated a simple linear regression for each league in order to better understand how attendance changes during recessions. The dependant variable in each regression was total attendance in the league in each season; the explanatory variables were a time trend term to capture the secular increase in demand for each sport and a variable that indicated the number of months during each season when the US economy was in a recession, according to the NBER business cycle reference dates. Using the number of months in each season that the economy was in recession is a better indicator of the effect of the business cycle than a simple indicator variable because of the timing of the start of recessions and the different start and end dates of the season in each league. For example, suppose a recession started in March of a given year and ended in November. This recessionary period would include the entire seven months of the MLB regular season, which runs from the beginning of April until the end of October; it would include four months of the NFL regular season, which runs from the beginning of September until early January, and it would include only four of the six months in the NBA and NHL regular seasons, which run from early November until mid April.

Table 1: Regression Results, Total Annual League Attendance Model

	Time Trend		Months in Recession			
Sport	**Estimate**	**T-Stat**	**Estimate**	**T-Stat**	**Observations**	**R^2**
NFL	**215,847**	**12.57**	**-224,122**	**-1.57**	**37**	**0.825**
NBA	**432,458**	**32.81**	**-184,992**	**-1.58**	**60**	**0.950**
NHL	**411,779**	**28.10**	**70,818**	**0.73**	**48**	**0.946**
MLB	**665,678**	**23.33**	**340,049**	**1.03**	**109**	**0.843**

Table 1 shows the results from this regression analysis: parameter estimates, t-statistics on two-tailed tests of the null hypothesis that the parameter estimate is equal to zero, and R2. The parameter estimate on the time trend variable is the average annual increase in total attendance in each league. Total attendance in MLB was increasing by the most, more than 600,000 per season on average, and total attendance in the NFL was growing by the smallest amount. These

parameter estimates are highly significant, with t-Statistics in excess of 10. This result is not surprising given that the NFL focuses much more on its television audience than on live game attendance while MLB focuses on gate attendance and other facility-related revenue sources.

The parameters of interest in Table 1 are on the variables indicating the number of months during each season when the economy was in a recession, as identified by the NBER business cycle reference dates. The average value of this variable is 1.67 in MLB, 0.88 for the NBA, 0.64 for the NFL, and 1.02 for the NHL. Recessions were relatively rare events during the sample period. The parameter estimate is negative for only the NFL and the NBA. In both cases, these parameter estimates are only marginally significant. The P-value on the two-tailed test of the hypothesis that the parameter is equal to zero is rejected at the 12% level for both sports. Given the relatively small sample sizes for these regressions, these parameter estimated provide weak evidence that total attendance in the NFL and NBA decline during recessions, and that the longer the recession lasts, the larger the decline in total attendance. The parameter estimates on the number of months in recession variable are not statistically different from zero in the NHL and MLB, suggesting that total attendance in these leagues does not respond to downturns in the economy. Attendance in the NFL and NBA may be more sensitive to the business cycle than in MLB and the NHL because ticket prices in the NFL and the NBA are, on average, higher. The more expensive the good or service, the more likely are households to reduce spending on that item when budgets get tight, especially for entertainment goods like tickets to professional sporting events, which are not necessities like food, clothing or shelter.

The regression models explain quote a bit of the observed variation in total annual attendance in these four leagues. The regression model explains between 84.3% and 95% of the observed variation in total annual attendance. The F-statistics on the overall significance of the regression models are also large (80.3 for the NFL, 541 for the NBA, 284 for MLB and 395 for the NHL), suggesting that, taken together, the models fit the data well.

Overall, the evidence indicates that the current economic and financial crisis will have a minor impact on gate attendance in these four North American professional sports leagues. Although visual inspection of the time path of annual total attendance uncovers some instances where total attendance appears to have declined during recessions, the regression results find only weak support for the idea that attendance will decline, with one caveat. The current economic and financial crisis appears to be lasting longer, and also seems more severe, than the average recession in the sample period. The US economy probably has not yet switched from recession to expansion – although the NBER business cycle dating committee only determines turning points after considerable time has passed – and the longer the current crisis lasts, the more likely it will affect attendance at professional sporting events.

Premium Seating

No comprehensive statistics are kept on premium seating sales in North American professional sports leagues. As mentioned above, the price of these seats, which include club seats and luxury boxes, are very high and many must be leased for one or more seasons. Premium seats and luxury boxes are primarily purchased by businesses, not individual fans.

In early November 2009, TicketOS, an on-line ticket purchasing company, announced the creation of an index to measure the use of premium seats and luxury boxes at sporting events by corporations in North America, based on a survey of large corporations. According to initial reports, club seat use averaged 73% in October 2009, and luxury box

use averaged 67%. Both were down relative to use in October 2008. However, corporate season ticket sales were reported to be up in ten venues located in large metropolitan areas like New York City, Boston, Washington DC, and Atlanta.

Anecdotal evidence also indicates that revenues from premium seats and luxury suites has declined in recent seasons. According to a recent article in the Indiana Business Journal (Schoettle, 2009), 10 luxury suite leases at Conseco Fieldhouse, home of the Indiana Pacers, were unsold just before the start of the NBA season and NFL teams in Cleveland (20 vacant suites), Jacksonville (20 vacant suites), Miami (30 vacant suites), and Detroit (35 vacant suites) were also having difficulty leasing luxury suites.

Broadcast Revenues and TV viewing

North American professional sports teams generate broadcast rights revenues from two sources: local broadcasting rights and national broadcasting rights. Teams negotiate local broadcast rights individually with local media providers and these revenues are not shared with the rest of the teams in the league. National broadcast rights contracts are negotiated jointly by the league and these revenues are shared equally by all teams in the league. National broadcast rights contracts extend over multiple seasons and the value of these contracts vary considerably across leagues.

It is difficult to determine the annual value of local broadcast rights contracts systematically for all North American professional sports leagues, so assessing the effect of the current economic and financial and economic downturn on these rights fees is extremely difficult. Clearly, local broadcast rights fees will be related to the size of the market that each team plays in, the quality of the team, the preferences of fans in the local market for viewing sports on television, and the presence and price of substitutes for sports on television in each market. In general, local broadcast rights fees will vary with overall television viewing trends. In both the US and Canada, overall television viewing did not decline following the beginning of the economic downturn in late 2007. Average television hours viewed in Canada remained steady at about 28.5 hours per week over the period 2004-2009. In the US, average television hours viewed per week increased from 36 hours per week in 2007 to 37.75 hours per week in the first quarter of 2009. If these trends reflect sports viewing habits, then local broadcast rights fees are not likely to decline as a result of the economic downturn.

Considerably more information exists about national broadcast rights fees, which are negotiated over long periods of time. Table 2 summarizes the current national broadcast rights fees for the major North American professional sports leagues as of late 2009.

Table 2: National Broadcast Rights Fees in North America

League	Rights Holder	Total Broadcast Fee	Contract Period
NFL	**ESPN**	**$8.8 billion**	**2006-2013**
NFL	**Fox**	**$4.27 billion**	**2006-2011**
NFL	**CBS**	**$3.73 billion**	**2006-2011**

NFL	**NBC**	**$3.6 billion**	**2006-2011**
NFL	**DirecTV**	**$3.5 billion**	**2006-2010**
MLB	**Fox/TBS**	**$3.0 billion**	**2006-2013**
NBA	**ABC/ESPN**	**$2.4 billion**	**2008-2016**
NBA	**TBS**	**$2.2 billion**	**2008-2016**
NHL	**Versus**	**$290 million**	**2007-2011**
NHL	**NBC**	**NA**	**2007-2011**
MLS	**ESPN**	**$64 million**	**2006-2014**

Note the wide disparity in the value of rights fees across leagues. The NFLs five national rights fees contracts generate in excess of $20 billion over the period 2006 to 2013. At the other end of the spectrum, MLS earns a paltry $8 million per season from ESPN for national broadcast rights. The contract between NBC and the NHL did not involve rights fees. Instead, NBC will pay the NHL the residual revenues after all costs related to broadcasts have been covered. Almost all of these contracts run through 2011, and the one contract up in 2010, between the NFL and satellite TV company DirecTV for a pay-per-view package of all NFL games, is relatively small. Thus the global economic and financial crisis will have little short run impact on revenues earned by professional sports leagues in North America.

If the economic climate has improved by the time these contracts expire, the long run impact may also be minimal. These revenue streams will only decline if the popularity of sports on television declines in the next several years. The ratings for the first week on the NFL season in 2009, a 10.3 share of the total television sets being watched, was up significantly over the ratings for the first week of the 2008 NFL season, an 8.8 share. In MLB, the ratings for the 2009 World Series, played in October, were also up significantly relative to the past five years. Some of this increase can be attributed to the presence of the New York Yankees in the World Series, but viewing did not drop, again suggesting that sports television viewing in North America will not be adversely affected by the economic and financial crisis.

Franchise Values and Bankruptcy

Another method for assessing the effect of the economic and financial crisis on professional sports leagues is to examine changes in the estimated value of franchises. Forbes Magazine produces annual estimates of the value of every professional sports franchise in North America. As was mentioned above, these franchises are privately held corporations that do not release audited financial data to the public. Because of this lack of information, the Forbes Magazine estimates are based on observable factors like attendance, media rights fees, and payroll along with the use of standard financial multipliers. Humphreys and Mondello (2008) find that these estimates contain considerable noise when compared to actual franchise sales prices. Despite this limitation, the Forbes estimates are the only information available on annual sports franchise values, since no professional sports team in North America currently issues shares

that are tradable on any stock exchange. At the time this paper was written, Forbes Magazine had released the 2009 franchise value estimates for the MLB, NFL and NHL.

Table 3: Average Change in Franchise Values 2008 to 2009

Sport	Average Franchise Value Increase (%)	Decreasing	Average Decrease (%)	Largest Decrease (%)
NFL	**0.16**	**25%**	**-3.37**	**-7**
NHL	**1.27**	**47%**	**-4.64**	**-11**
MLB	**1.23**	**33%**	**-5.70**	**-12**

Source: Forbes Magazine

Table 3 summarizes the Forbes estimates of changes in franchise values from the 2008 season to the 2009 season. Note that this period coincides with the worst of the economic and financial crisis in North America, based on the discussion above. If teams feel the pinch from the ongoing recession and financial disruption, it should be reflected in these estimates. All three leagues saw extremely modest increases in average franchise values from 2008 to 2009. These increases are not inflation adjusted, but the inflation rate in the US, based on changes in the Consumer Price Index, was essentially zero over this period, so deflating would have no impact on the estimates of increases in franchise values.

From Table 3, eight of the 32 NFL franchises declined in value over the past year, and the average decline among these eight was about 3.3%. Almost half of the NHL franchises declined in value, and one third of the NBA franchises declined in value. The size of the decline in the NBA and NHL were larger than in the NFL, and a handful of hockey and basketball franchises saw double digit declines in their value. These declines in franchise values suggest that professional sports teams have been adversely affected by the economic and financial crisis. Humphreys and Mondello (2008) report very few instances of declines in the value of professional sports franchises over the past forty years, and the hedonic franchise price index they develop contains relatively few short run downturns in the average franchise price. However, the decreases in franchise values are relatively small when compared to the decline in the value of publicly traded firms in the US. Broad market indexes in the US like the Standard and Poor's 500 declined by more than 30% from 2008 to 2009, indicating much larger average declines in the value of publicly traded firms, so these estimates of the change in the value of sports franchises suggest that professional sports leagues fared much better than many other sectors in the US economy over the past year.

Another indicator of the effect of the economic and financial crisis on businesses is bankruptcy filings. In the US, any business or individual that is unable to pay off its debt can appeal to a federal bankruptcy court for protection from creditors under a law commonly referred to as Chapter 11. Filing under Chapter11 bankruptcy implies that the business or individual will be unable to fully pay off its debts, signaling extreme financial duress. Chapter 11 filings involve a reorganization of debt, and most firms undergoing Chapter 11 reorganization continue to operate. The economic and financial crisis has had a clear effect on bankruptcy filings, which increased by 31% from 2007 to 2008.

In the past year, two professional sports teams have filed for bankruptcy under Chapter 11: the Chicago Cubs and the Phoenix Coyotes. Both cases involve special circumstances that make them non representative of the overall financial health of the sports industry. The Chicago Cubs were owned by the Tribune Corporation, a media conglomerate that also owned numerous newspapers and television stations. The Tribune Corporation filed for bankruptcy under Chapter 11 in 2008. The Cubs were not bankrupt in the sense that the team was able to pay its debts. However, the team filed for bankruptcy in order to make the sale of the team possible, and to avoid paying $300 million in taxes, the team filed for bankruptcy. The Cubs were sold to an individual owner, Tom Ricketts, for $875 million in October 2009. Although the Phoenix Coyotes hockey team had allegedly been losing money for several years, the team's bankruptcy was directly caused by the financial problems of the team's owner, Gerry Moyes, who was also involved in extensive real estate speculation. The Coyotes were sold to the National Hockey League for $150 million in October 2009.

Conclusions

While the industry has not escaped from the current economic and financial crisis unscathed, the evidence presented above indicates that the overall impact in the short run has been relatively minor. On the revenue side, attendance may decline slightly in the NFL and NBA, but overall attendance is unlikely to decline significantly as a result of the recession. Television viewing has not dropped, and the long-run broadcast rights contracts currently in place insulate the leagues from any decline in broadcast rights revenues for the next several years. Broadcast rights fees could decline when the current contracts run out in 3 to 4 years, but by that time the general economic environment could improved significantly. The biggest short term consequence on the revenue side is the possibility that revenues from luxury suites, premium seats and sponsorship could decline due to reduced spending by businesses. On the cost side, the existence of salary caps and limited free agency insulates payroll costs from the influence of outside economic and financial forces. The biggest threat on the cost side is the expiry of the Collective Bargaining Agreements between the leagues and players' unions in 2011 (MLB, NBA) and 2012 (NFL and NHL).

The evidence from estimates of franchise values suggests a modest impact on teams. Although a large number of teams experienced small declines in estimated value, the impact appears much smaller than in other sectors of the economy. However, the impact of the current economic downturn could be more severe if the current recession, which began in December 2007 and is now 23 months old, continues for a significantly longer period of time. The average length of al recessions in the US since 1857 was 17 months, and the 10 recessions since 1945 have lasted an average of just 10 months. The current recession is already quite long in historical context. Another year of recession might bring about additional financial problems in the professional sports industry in North America.

In the long run, the biggest potential area for problems in professional sports in North America is the effects of the financial crisis on access to credit. The professional sports industry in North America is in the middle of a stadium and arena construction boom that began in the early 1990s (Zimbalist and Long, 2006). Zimbalist and Long (2006) report that the median cost of new stadiums since 2000 was $455 million, and the median cost of new arenas was $210. Several recent facility construction projects, including new stadiums for the New York Yankees and Dallas Cowboys, cost more than $1 billion. The pace of new sports facility construction does not appear to have slowed in recent years. Although these projects typically involve substantial public funding, teams are increasingly pressured to provide their own, privately generated funds for new facility construction. The global financial crisis will have important effects on borrowing and the operation of credit markets. The extent and nature of these changes are still unknown, but it is

reasonable to expect that access to credit will not be enhanced by the new regulations and business practices adopted by lenders. Financing of new facility construction projects, as well as the renovation of existing facilities, will be more difficult in the future. The pace of new facility construction will probably decline, and only franchises with the strongest potential for future revenue generation will be able to borrow to finance facility construction. The effects of restricted access to credit on the core sports product, contests and league championships, is difficult to predict. Quinn, et al (2003) found no relationship between new facilities and on-field success in all four professional sports leagues in North America. But if prolonged economic and financial problems lead to reduced spending on maintenance on existing facilities, the financial and on-field consequences could be quite different.

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General Principles for Real Options applied to Professional Football Player Valuation

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1. Antecedents

The phenomenon of globalization has also had an important effect on the world of sport. The sports phenomena consumer has gone from a relatively closed community, whose area of influence was limited to fans who were directly involved through the assistance of shows, to a globalized world, where television and other popular media has been of vital importance in the expansion of sports events that can be consumed anywhere in the world.

As consequence this not only involves a cultural change but also an immediate effect on how we manage, what we call "football business". The high level of financial resources managed by directors as a result of the expansion of revenue sources has obliged to do efforts to face a board of management professionalization and the adoption of corporate formulas to provide a wider source of funding.

Anyway, not only the effects of globalization are manifested in the exploitation of new resources generated by the phenomenon of overcrowding but also has significant effects on institutional relations, business, labor, tax and accounting, so that even discussing whether the law that applies to the sport is already a branch or sector of the legal system with its own principles and autonomous institutions.

The complexity of the above mentioned is manifested in many different fields from a corporatism corporate model to even building up a way to manage image rights, including labour and tax relations with sport professionals. And even a topic less studied like the media phenomenon on sporting world, causing an irresistible attraction to singular characters with significant financial resources, even though sometimes with very low training and knowledge about sports.

In terms of academic level emerge another important consequence, among all subjects; concerning about valuation of professional athletes, from fuzzy sets to the real options approach models, being the last one analyzed in this seminar.

Finally, It is not less important collateral effects of phenomenon sports on other activities associated with it: press, catering trade, travel, consulting services, etc. that generate an important contribution to GDP of the countries where professional sport activity is manifested permitting us to dimension the magnitude of all this.

2. The management of the professional football. Players' valuation

One of the topics less analyzed by the doctrine is referred to the valuation of professional player's rights, which treatment is a fundamental key to estimate duly in its set for this type of entities. In most cases the unique value of the sport firms are their human assets, this reality force them to demand knowledge on this topic to facilitate a right way to obtain adequate cash flows from sale or transfer actions.

In fact, nowadays more and more studies are published focusing mostly on patrimonial and business value of these firms. The immediately consequence is a need that allow us to incorporate objective criteria of valuation that incorporate

modern technologies habitually used in business world. Among all of them, is necessary to enhance a couple of them, blurry subsets and real options methodologies.

We are going to try to expose real options valuation method, referred above, because this one allow us to incorporate intangible assets item, that would generate the rights that clubs could get as result of transferring professional players. Even tough accounting normative regard these assets in a paragraph called intangibles, with a denomination of " rights of transfer ", the value that these rights figures in our accounting system is by the price of acquisition, that is, the one that the firm has had to do effective for signing up a mentioned player.

In Spanish accounting norm of the sporting entities is gathered in the Law of the Sport, October 15th, 1990 and in Royal Decree 1251/1999 of July 16th and Ministerial Order of June 27th, 2000 (BOE of June 29th). Procedure of sectorial adaptation norms from General Accounting Plan for companies sports leaderships, as well as for other entities like Clubs or associations sports leaderships, so much if they take part in professional or not sports competitions.

In this norm, when is referred to assessment of the "rights of players" acquisition from other entities will gather "the satisfied amount for the acquisition of the right to incorporate this player to the team", including the amount due to pay to the entity form the player comes from, as well as, all incurred costs that are necessary for the player's acquisition. This amount will be amortized in the total number of years on the term of the agreement, that is, will depends of overall service life, without, as general assumption of a residual value that will exist at the end of this contract and then the player will be free to negotiate a new one with anyone.

Likewise, it is established that amounts derived from renewal must have similar nature than from transfer for the acquisition of the player's right plus necessary incurred costs for this concept, it will be added as a greater value of the right provided whenever it does not exceed its market value, amortizing in the new period of time fixed in the new contract.

Therefore, the accounting rule is referred to the topic for acquisitions value as fair value, equivalent to the market value that could be obtained by the transfer of the player. This oblige us to estimate an intangible asset, not regarded in any accounting system, that depends of relative questions such as physical and technical characteristics of any candidate. For all this, it is necessary to apply a real option methodology.

The Intangible fixed assets topics is defined in the International Norm of Accounting (NIC) 38th of the IASB as "an intangible asset is an identifiable asset, of not monetary character at all and any appearance physics, which use is fundamental in the production or supplies of goods and services ".

3. General principles for real options applied to professional football player valuation.

- The real options have countless applications not only for professional football managers but also in the develop and valuing options on football players, including inner generated by the club.
- So suppose, that we denominate I_0 to the underlying or market value for the player in a moment t_0 , by other side, I_1 will represent a new exercise price for this one, for a subsequent moment, from which it is

supposed that it will be ready to generate the expected operational cash flows . During the building up process the managers will be able to take decisions in terms of market conditions for this item, so for this example we could;

a) Carry on with the project.

b) Reduce the production level of new inner generated football players in a percentage "c", saving a portion of the last payment ($c*I_1$) if we are behaving a bearished football player price market , well because the own market conditions or well because a lower expectations in a certain player.

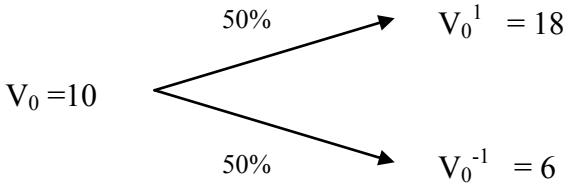
c) Design a flexible financial buying process , that is, if prices rise up over the amount expected, the production rate could be increased in a percentage "x" paying out an additional amount $x* I_1$.

d) In any moment close down our investment getting a residual value for the player.

So, let's suppose firstly, that we have an investment opportunity now that we denotes by I_0 = 10,5 (dollar millions) in a football player project. Let's start from the hypothesis that we are able to calculate the actual value of all expected cash flows of this project for next period of time that we denotes by V_0^1 = 18 dollar millions for the up alternative case and being for the down alternative case denoted by V_0^{-1} = 6 dollar millions.

In principle, we could assign same probability rate to both situations, that is, same number of cases for an upward or downward price direction for this football player. We will suppose that similar projects in terms of maturity and risk are getting a return denoted by "k" variable and also we admit a risk free rate for this project denoted by "rf" variable with 20% and 8% rate respectively.

Figure nº 1



It is obvious that if we calculate NPV of this project at initial time we will get a negative value;

This value $NPV = -I_0 + V_0 = -I_0 + \left(\frac{\left(p * V_0^1\right) + \left(q * V_0^{-1}\right)}{1+k} \right) = -10{,}5 + \left(\frac{(0{,}5 * 18) + (0{,}5 * 6)}{1+0{,}2} \right) = -10{,}5 + 10 = -0{,}5 < 0$ would oblige us to reject this project because of not have considered any implicit options. This decision would have carry on to reject football players that as we will explain later could be profitable for the club.

Now then, such options could be valued if we do a neutral risk approach valuation process, this will allow us to valuate the net present value for any player's right. So I few have any option on any player's project we could choose to defer

one period of time and we will exercise this right only when we get a profit and we will refuse to this in any other case, that is, we will be working in a neutral risk environment.

If we do not use real options and we decide to carry on with the project, we could face the next following situations;

a) We could earn 4,5 dollar millions for the case that player's price rise up, that is,

$$\Pr ofit = \frac{V_0^1}{1+k} - I_0 = \frac{18}{1{,}2} - 10{,}5 = 15 - 10{,}5 = 4{,}5$$

b) We could lose 5,5 dollar millions in any other case, that is when price rise down, that is,

$$Lost = \frac{V_0^{-1}}{1+k} - I_0 = \frac{6}{1{,}2} - 10{,}5 = 5 - 10{,}5 = 5{,}5$$

If we use risk neutral probabilities method, the discount rate that we will need to use for future cash flows is the risk free rate. Additionally if we accept this hypothesis we will need to revaluate the cash flows before mentioned, without altering the initial result, as long as exist real options.

In that way we will evaluate the risk neutral probabilities for an upward movement in prices (p) and for a downward (1-p or q). Therefore we will be able to reformulate the "p" variable as follows;

$$p = \frac{\left(1+r_f\right)*V_0 - V_0^{-1}}{V_0^1 - V_0^{-1}} \qquad \text{q= 1-p}$$

Being;

$$V_0 = \left(\frac{\left(V_0^1 * p\right) + \left(V_0^{-1} * \left(1-p\right)\right)}{1+r_f} \right)$$

And we will get that;

$$p = \frac{\left(1+r_f\right)*V_0 - V_0^{-1}}{V_0^1 - V_0^{-1}} = \frac{\left(1+0{,}08\right)*10 - 6}{18-6} = 0{,}4$$

Therefore ;

$$q = 1\text{-}p = 1\text{-}0{,}4 = 0{,}6$$

Under the neutral risk hypothesis the net present value of this player, that is denoted by E_0, is equivalent to ;

$$E_0 = \frac{\left(p * E_0^1\right) + \left((1-p) * E_0^{-1}\right)}{1 + r_f}$$

Where ;

- E_0^1 Indicate us the value for the player (always assuming risk neutral hypothesis) in one forward period of time and an upward price case.
- E_0^{-1} Indicate us the value for the player (always assuming risk neutral hypothesis) in one forward period of time and a downward price case.

This values will be very useful to us because will allow us to estimate real options value.

We believe that is important to check that without real options the Net Present Value evaluated by this procedure match up with classic discount cash flow method.

It is important to appoint that;

- E_0^1 is equal to V_0^1 , therefore equal to 18.
- E_0^{-1} is equal to V_0^{-1} , therefore equal to 6.

So the present value is equal to;

$$E_0 = \frac{\left(p * E_0^1\right) + \left((1-p) * E_0^{-1}\right)}{1 + r_f} = \frac{0{,}4 * 18 + 0{,}6 * 6}{1 + 0{,}08} = 10$$

The present value is the same such as we calculate it with associated subjective probabilities (50% for upward and downward in the price movements) and with a discount rate according to the level of risk assumed (20 % for this case), like if we obtain them through different risk neutral probabilities (40% for upward and 60% for downward movements respectively) and with a discount free rate (8% in this case). These risk neutral probabilities are going to be used to estimate some different real options value.

So, at this time, we are ready to analyze different types of real options that we can find when we evaluate football players projects, and we proceed to do in an individualize way , that is, we will study each option as it only exists in its own and no more.

Anyway, we must be conscius that in the real world it is possible to develop and issue different real options simultaneously, being necessary to evaluate the total number of them, being obligatory to do some type of adjustment that we are not going t indicate in this paper for not being the principal focus of this document.

- A Differ Option for an Investment Decision on a particular case, the football player.

The property of a temporal right on a football player give us the chance to differ an investment decision making project during a period of time, that in our case we could assume, as initial hypothesis one year, the necessity to reduce the uncertainty over the performance on our football player in a next future. In this way, if the player's price rise up enough during next year, at the end of that one, the board could settle to invest an amount I_1 , exercising the option bought.

So we must evaluate which is the player value one moment after before expires its right, being this equal to;

$$E_0^1 = \text{Máx. } (V_0^1 - I_1 \ ; 0)$$

We can appoint that the differ option is similar to an american bought option over net present value of the expected cash flows of this project, that we denotes by (V_0^1)and which exercise price is I_1 . This is dued to an anticipated decision for exercise this project and this implies to reject a differing of the option. The value for this works as an opportunity cost, justified by the execution of this project for the case only when the present value of all the cash flows exceed the present value of an initial pay out for an important amount (this sum represents a differ option value)

Set I_1 equal to 10,5 * 1,08 = 11,34 dollar million, meanwhile the present value for this project one forward year, under neutral risk hypothesis are calculated in base to previous formula, that is:

E_0^1 = Max (V_0^1- I_1 ; 0) = Max (18- 11,34 ;0) = 6,66 dollar million.

E_0^{-1} = Max (V_0^{-1}- I_1 ; 0) = Max (6- 11,34 ;0) = 0 dollar million.

So, the total value of our project, including the differ option, is calculated with the previous formula explained, then:

$$E_0 = \frac{\left(p * E_0^1\right) + \left((1-p) * E_0^{-1}\right)}{1 + r_f} = \frac{0{,}4 * 6{,}66 + 0{,}6 * 0}{1 + 0{,}08} = \frac{2{,}664}{1{,}08} = 2{,}466$$

Therefore, if we want to know the real differ value option for this project , we only need to subtract to the total value, the Net Present Value Basic, that is;

Differ option value = Total Net Present Value of the project – Net Present Value Basic= 2,466 – (-0, 5) = 2,966 dollar million.

As net present value for expected cash flows reach's 10 dollar million, this means that the differ option value is equivalent to its 29, 66% of all these cash flows.

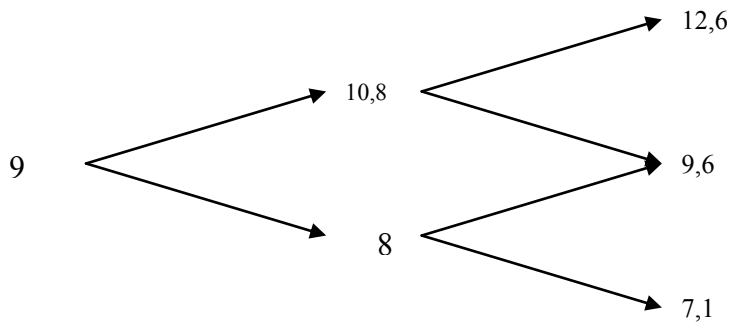
- A closed down option. A particular case, the football player.

The managers are conscious that in case to loose the category where they play, the club must not commit in a high volume of fixed costs, this will force to sell the most of the times a concrete number of players. That is, the board has the option to abandon the project in exchange to the market value of the assets that they own. This is an american option over the present value of the project (VA), which exercise price is the residual value or the best possible alternative (VR) that gives to the board the opportunity to receive:

VA + Máx [VR - VA ; 0] = Máx [VA ; VR]

So, assume now that the residual value for a professional football player (or the best alternative) is distributed as follows;

Figure nº 2



In the figure above we can observe that the present residual value (VR_0 = 9 millions) is under the present value of the project (VA_0 = 10 millions), that is because if was not that the board could have chosen do not invest this sum, as well we also work with the same internal rate of interest (IIR) than the project (20%), Therefore, the value of this project for the shareholders would be equivalent to ;

E_0^1 = Máx [VA_0^1 ; VR_0^1] = Máx [18 ; 10,] = 18 (continuity value)

E-1 = Máx [VA1- ; VR1-] = Máx [6 ; 8] = 8 (abandon value)

So, the value of this project, including an abandon option would be equal to;

$$E_0^C = \frac{\left(p * E_0^1\right) + \left((1-p) * E_0^{-1}\right)}{1+rf} - I_0 = \frac{(0{,}4 * 18) + (0{,}6 * 8)}{1+0{,}08} - 10{,}5 = 0{,}611 \text{ dollar millions.}$$

Therefore, the total abandon option value would be just calculated as follows:

Closed down option = Total Value – Net Present Value Basic = 0,611 – (-0,5) = 1,11 dollar millions.

In fact, the principal reason for a rational investment decision in different periods of time is just because we want to be long with this abandon option.

The abandon option value will increase:

a) When we get a higher uncertainty over the future value on this football player.

b) When we get a higher maturity of time to exercise the option.

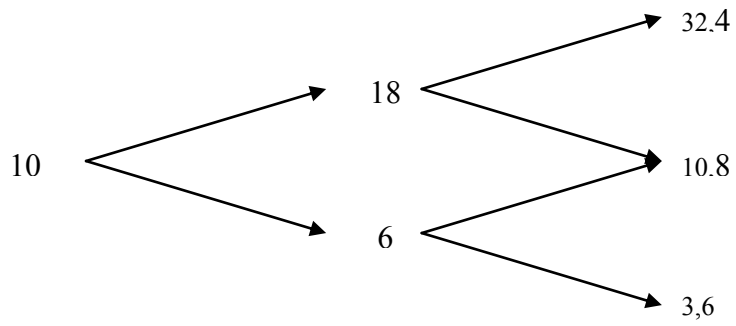
c) When we get a higher relation between the abandon value and the continuity value of this football player. (Present value of rest of the free cash flows less any additional remaining investment making decision)

- A two period case: The generation of options.

The valuation of football players not only is limited to next period of time (basically a fiscal year or a championship year) it is possible to extrapolate to subsequent years. So if we want to evaluate the value of this project at the end of first years it is necessary to remind that the present value of this in that moment could be valued well VA_0^1 = 18 dollar millions, or well VA_0^{-1} = 6 dollar millions respectively.

If we consider a growth rate the value of the project is 1, 8 dollar millions for the upward case and for the downward would be 0,6 dollar millions as we regard in the next figure:

Figure nº 3



In the case that we consider an optimistic conditions we would get that $VA_0^{11} = VA_0^1 * 1,8$ = 32,4 dollar millions, if we consider normal conditions the value reaches $VA_0^{1-1} = VA_0^1 * 0,6$ = 10,8 dollar millions, meanwhile under pessimist conditions we would get that $VA_0^{-1-1} = VA_0^{-1} * 0,6$ = 3,6 dollar millions.

E_0^{11} = Máx [VA_0^{11}; VR_0^{11}] = Máx [32,4 ; 12,96] = 32,4 millones (continuity valué)

E_0^{1-1} = Máx [VA_0^{1-1}; VR_0^{1-1}] = Máx [10,8 ; 9,6] = 10,8 millones (continuity valué)

E_0^{-1-1} = Máx [VA_0^{-1-1}; VR_0^{-1-1}] = Máx [3,6 ; 7,11] = 71,1 millones (abandon valué)

With all this data we could evaluate the professional player value at the end of the first year;

a) Under optimistic conditions:

$$E_1^1 = \frac{\left(p * E_2^{11}\right) + \left((1-p) * E_2^{1-1}\right)}{1+r_f} = \frac{(0{,}4 * 32{,}4) + (0{,}6 * 10{,}8)}{1+0{,}08} = 18 \text{ dollar millons}$$

b) Under pessimist conditions:

$$E_1^{-1} = \frac{\left(p * E_2^{1-1}\right) + \left((1-p) * E_2^{-1-1}\right)}{1+r_f} = \frac{(0{,}4 * 10{,}8) + (0{,}6 * 7{,}11)}{1+0{,}08} = 7{,}95 \text{ dollar millons}$$

Therefore, the value of this project, including an abandon option, would be equal to;

$$E_0 = \frac{\left(p * E_1^1\right) + \left((1-p) * E_1^{-1}\right)}{1+rf} - I_0 = \frac{(0{,}4 * 18) + (0{,}6 * 7{,}95)}{1+0{,}08} - 10{,}5 = 0{,}583 \text{ dollar millions}$$

Finally, the value for a total abandon option for this player will be equivalent to:

A closed down option = Total Value – NPV basic = 0,583 – (-0, 5) = 1,083 dollar millions.

- The problems that generate this model is in terms of calculus and cash flows dynamics, as well as the moment where they are generated. For that, we believe necessary to put forward any type of model that allow us to evaluate with a certain severity the value for any inner generated professional player. This consist in to value any other type of option called growth options, taking in account the different phases along the professional player life.

4. Valuation of professional players by real options: rights inner generated by clubs.

The monetary value generated by a professional player that rised through the ranks comes from the sum of the following two components;

- Value generated by Merchandising.
- Market value of the professional player.

4.1. Value generated by Merchandising.

We estimates that the accounting item "merchandising incomes" could follow the next SDE (stochastic differential equation);

$$\frac{dR_t}{R_t} = \mu_t dt + \sigma_t dz_1 \qquad (1)$$

being (R_t) the income variable component at time any t, where the drift (μ_t) is the expected rate of growth in revenues generated by the professional player, that is assumed to follow a mean reverting process with a long term average drift $\bar{\mu}$ and being (σ_t) the volatility of the expected rate of growth of the incomes at time any t. The variable (z_1) incorporates a random variable that follows a stochastic behaviour and is behaved as a normal distribution. So the variation of the drift μ_t follows the next process:

$$d\mu_t = k(\bar{\mu} - \mu_t)dt + \eta_t dz_2 \qquad (2)$$

Where (η_t) is the expected growth rate volatility in revenues, and (*k)* indicates us the rate to which is expected to converge to its long term average.

The non expected changes in the revenues are assumed to converge to a rational merchandising market level, that is, we will suppose that it converges to an average growth rate of the incomes obtained by among professional clubs set that rival each other for reaching the first position on the board at the end of the championship. It is possible to include the

results obtained in other countries such as Champion League in the UK. So we can determine that the dynamics of the volatility (*k)* drives by the following process;

$$d\sigma_t = k_1(\sigma - \sigma_t)dt \qquad (3)$$

Let it be the volatility variation expected growth rate for the revenues

$$d\eta_t = -k_2\eta_t dt \qquad (4)$$

The unanticipated changes in the growth rate of revenues and the unanticipated changes in its drift may be correlated;

$$dz_1 dz_2 = \rho dt \qquad (5)$$

So we could determine the cash flows generated by each professional player , alter taxes, as function of Y_t variable;

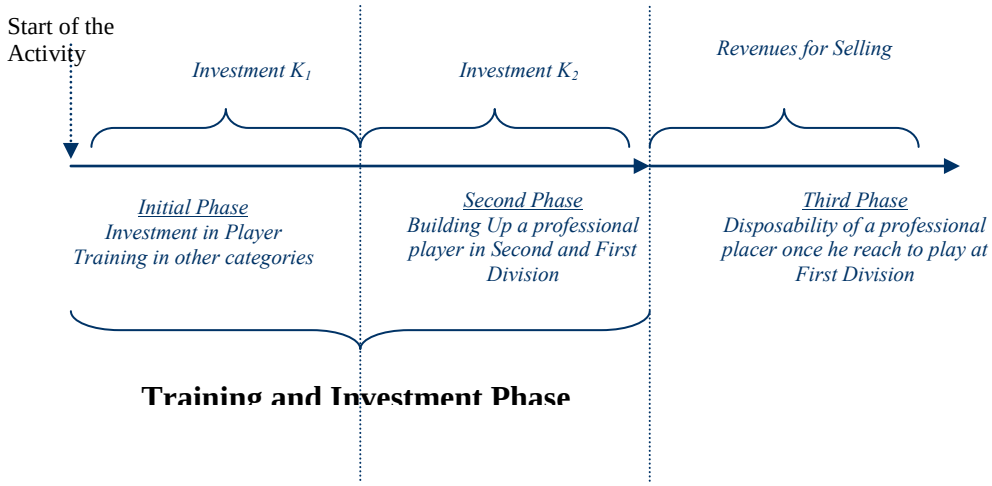
$$Y_t = (R_t - Cost_t)(1 - \tau_c) \qquad (6)$$

Where *($Cost_t$)* could be considered the merchandising necessary cost for generating the revenues, and *(τ_C)* is the effective corporate tax rate.

4.2. The Fair Value for professional player.

It is necessary a planning of work that allow us to face with certain guarantees the valuation of a player that rise through the ranks, so we could;

FIGURE Nº 4



The model is built up for two stochastic equation dynamics, one for the training cost of the future professional player and other for cash flows variable. So we can evolve for the first the next one;

$$\mathrm{dCF} = -I\ \mathrm{d}t + \gamma(ICF)^{1/2}\,dz \qquad (1)$$

Where (CF) are the training cost for the future professional player, (I) is the investment rate for a player in an infinitesimal period of time (dt), (γ) is the desviacion for the changes evolution in training cost and (dz) is an incremental in a non correlated Wiener process with the signing market. In the above formula mentioned before we can observe that the outstanding training cost is reduced time after time meanwhile new investment decisions are applied on our future professional player, this item also is driven also by another stochastic process.

This model assume the hypothesis that will continue investing in the training of this player until the club can activate him in its balance sheet, for a subsequent possible selling in the target market, it is also considered the possibility of a concrete fact, like an injured or even a failure in its development that oblige to abandon a determined project of a professional in developing. The training cost in the first phase include not only the necessary for reach a future success, but also any other obligatory for enhancing and facilitate to activate this player and so to be able to offer to the signing market.

For each simulation, we use the above formula (initial phase and second phase) such as it follows:

a). Initial Phase.Training a future professional player.

The equation in discrete time would be as follows:

$$CF_{1,t+1} = CF_{1,t} - I_1\Delta t + \gamma(I_1 CF_{1,t})^{1/2}\sqrt{\Delta t}\ \varepsilon_1 \qquad (2)$$

Where (Δt) is an interval between t y t+1 and (ε) is distributed as a standard normal (0,1). The training total cost for the Initial Phase is updated aggregating the respective investment for all the training period.

$$TotCost_{1,t+1} = TotCost_{1,t} + I_1\,\Delta t \qquad (3)$$

-
- At the end the Initial Phase the value for $TotCost_{1,t+1}$ allow us to estimate the training cost (CF) that allow us to complement the Second Phase;
-
- $$CF_{2,\psi_1} = TotCost_{1,\psi_1} * \varpi Ratio \qquad (4)$$

Where $\varpi Ratio$ is the ratio that represents the number of times in terms of training cost of the Initial Phase necessary for tackling the target market.

c) Second Phase. Building up a professional player.

One more time, we develop a discrete time approximation for the training cost equation:

$$CF_{2,t+1} = CF_{2,t} - I_2 \Delta t + \gamma (I_2 CF_{2,t})^{1/2} \sqrt{\Delta t}\ \varepsilon_1 \quad (5)$$

In this model we do not consider Risk Premium, this implies that we can use the risk free rate to discount the training cost independently in the phase that we stay.

Once we have finished the training cost dynamic, we must focus on developing a model for the cash flows derivate from this professional player when figures in a selling process, assuming that follows the next dynamic:

$$\mathrm{d}F = \delta F \mathrm{d}t + \upsilon F \mathrm{d}x \quad (6)$$

Where (δ) is the drift for the cash flows and (dx) is an incremental in a Wiener process none correlated with the value of the professional player, but probably correlated with the necessary cost for completing the training phase, and (υ) is the volatility of the cash flows in continuing time. A (δ) positive indicate an upward drift for the cash flows, meanwhile a (δ) negative will indicate us a downward in cash flows, that could origin, for example, because of a better progression in any other professional players with same attitudes.

The model assumes for cash flows a risk Premium (η_j), that is incorporated in previous process:

$$\mathrm{d}F = (\delta - \eta_j) F \mathrm{d}t + \upsilon F \mathrm{d}x \quad (7)$$

We could also consider a discrete time approximation for this model, with the target to do useful in terms of simulation for the Second Phase considered above and it would be as follows;

$$F_{1,t+1} = F_{1,t} * e^{[(\delta_1 - \eta_j - \frac{1}{2}\upsilon^2)\Delta t + \upsilon\sqrt{\Delta t}\ \varepsilon_2]} \quad (8)$$

Where (Δt) is the interval between t and t+1, is the drift of the cash flows, (η) is the risk premium, (υ) is the volatility of this cash flows and (ε_2) is distributed as a standard normal distribution N(0,1) correlated (ρ) with (ε_1) defined through a training cost function.

At the end of this first Phase, the initial cash flow from the principal market was calculated by

$$F_{2,\psi_2} = F_{1,\psi_2} * \omega Ratio \quad (9)$$

Where ($\omega Ratio$) is the ratio that represents the Lumber of times in terms of cash flows from the Initial Phase that is necessary for reach the Second Phase.

For updating the cash flows generated by the selling of this professional player we will use the same formula that we did for the training and investment phase, but only we will swap the parameter(δ_1) by this new parameter(δ_2) .

$$F_{2,t+1} = F_{2,t} * e^{[(\delta_2 - \eta_c - \frac{1}{2}\upsilon^2)\Delta t + \upsilon\sqrt{\Delta t}\ \varepsilon_2]} \quad (10)$$

So, the value of this Project is obtained by a classic formula that results as follows:

$$V = PVF - PVCF \qquad (11)$$

That is, the difference between present value of positive cash flows and present value of training cost for the professional placer. For making a comparison we will obtain two values for each project: (V_e) for the training phase and necessary investment in this player and (V_T), that will include both phases. The solution to the valuation model will have to solve by numeric methods using Montecarlo, because we do not be able to get an analytic solution.

4.3. Abandon value.

Making a decision between abandon or not the Project of this professional player will depends of the present value of the cash flows and costs that still does not have considered at present time, taking in account the two phases, because the biggest profit is reached when the sell of the professional player is made.

The current model allow us to simulate the effects of different abandon decisions: a project must be manage until the end or abandoned when in a particular subsequent period of time the Net Present Value worth's cero(traditional criteria) or leave it as soon when the difference between net present value of the future flows less a percentage of present value of the cost drives to a zero value. By this reason, we computate an abandon value using the following next formula;

$$AbandonValue_t = PVF_t - \alpha * PVCF_t \qquad (12)$$

Where α is a number between 0 and 1.

To leave a Project is a definitive decision that carry out to leave any future improvement, and for this reason is key to find the abandon making decision that maximize the present value of the project among different parameters. If we do a comparative with financial options we would be managing an American option, with a strong time path dependent and stochastic. Under all this we could not have found for these cases any optimal strategy for exercise.

5. Conclusions.

The valuation and its accounting notes in Financial Statements of professional sportsmen rights are revealed as a daily problem if we consider the economic flow volume that is reaching in terms of overall sport market. It has been a diverse and different approaches about the question mentioned previously and there has not been tackle in deep with current models the real valuation of these professional rights.

After we have dealing with this type of questions and having considered current international accounting normative in terms of this topic, our paper set out the valuation of players inner generated by professional clubs by a real option model. This kind of models considers the option of abandon, delay or to expand a project for any inner generated professional player by the club, this allow us to manage the uncertainty about the evolution and value of each project.

This will help us not only to get the value of every professional at any time but also the optimal moment for the selling. This will provide a better decision instruments for managing a better way all the sources of cash flows that will make easier to improve the financial health of professional clubs. So, as example, is very important to indicate that an inner generated football player with high level of faculties at the age of 23 or 24 years old could be possible to generate a net cash flow (basically because for selling incomes) about 15.000.000€, after training costs and necessary investments for its generation as a professional football player, being to face a necessary cost previous of 9.000.000 €, this would oblige to get a total gross income close to 24.000.000€

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Governance and Sporting Success of Top20 Football Clubs after Economic Crisis

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1.- Introduction

The arguments over the relationship between sporting success and economic variables have gone on for years. The case of football is surely the most interesting and even more important example from a quantitative point of view. Similar things could be said about other sports such as Formula 1 for example. The issue of sporting success is not simply an aspect that is linked to the epic and immeasurable size of a sporting talent, which nevertheless still remains an inescapable element to success, but it must take its place alongside other issues such as the governance of clubs, investments, the system of regulations, the structure of a club's costs and profits.

What we are referring to obviously concerns team sports, sports in which results do not depend on an individual's performance, but becomes the sum total of so many individual performances, even if in some cases with differing roles and responsibilities. Sporting success therefore presents itself with a collective connotation and contributes to the increase of a team's long term value.

2.- The European market

Deloitte's 2009 report brings to light some interesting facts such as the European football market being worth €14.6 billion.

The five biggest football federations (the Big Five) alone control some 50% of the market with a turnover of €7.7 billion, an increase of 10% over the previous year. Of these *Big Five* it is the Premier League that tops the list having generated revenues of €2.4 billion taking advantage of the new agreements on television rights and leaving its foreign competitors lagging even further behind. This is something that becomes even more apparent with the exchanges rate for Euro – Sterling. Spanish teams Barcelona and Real Madrid have recorded notable hikes in revenue, making them the third and first teams in the world for revenue volumes. These increases have meant that the Spanish Liga is now on an equal footing with the Bundesliga with €1,438 billion pushing it above Italy's Serie A that is next in line with €1,428 billion. Propping up the *Big Five* is French football that has recorded revenue volumes in the region of €1 billion. Of the five it is the Italian federation that has seen the greatest rise in its revenues with an increase of 34% shared almost equally between three types of revenue sources: merchandising, television rights and match day attendances. An analysis of the different teams shows that these percentages differ totally, with the Spanish teams and Bayer focussing on merchandising, the Italians on television rights and the English on stadium ticket sales. In general football shows itself to be a counter-cyclical sector that is growing even in the midst of an economic crisis.

3.- The governance of sporting activities

There is no doubt that the problem of the governance of sporting clubs and those of football clubs in particular is a central issue. This can basically be split into the following three different types of governance: entrepreneurial model of governance; association-type model of governance; patronage-based

model of governance. The entrepreneurial model and that based on patronage are those found mainly in Italy and England, whilst the association-type model constitutes the backbone of the Spanish system. The limitations of the entrepreneurial system are clear to see and are associated with: a) limited return on investments; b) the irrelevance of the club's capital and its easy depreciation; c) high running costs. The patronage based model is threatening to intoxicate the market because it allows some to invest without taking into account the returns on their actual investments and for objectives that are totally set apart from sport itself. Berlusconi's Milan is in this case very symptomatic of this. The association-type model appears to be the one that works the best if we consider that Real Madrid and Barcelona are among the first three clubs in the world in 2008 for revenue, and they operate on an association-type model. Nevertheless this model is too closely linked to specific territorial issues and is not easily exportable or generalizable. The football market therefore is also characterised by the confronting of these different operating models that are often decisive in sporting success or even failure. The buying and selling of players and the resultant strengthening or weakening of a team find differing meanings and different outcomes in the different operating models. The strengthening of a team is a way of boosting an image in the case of the patronage-type or contributing towards the election of a chairman in the case of the association-type. In the entrepreneurial model the weakening of a team can be an attempt to wipe out debts or eliminate annual losses.

Financial fair play in this context manifests itself as a regulatory mechanism that attempts to wipe out this starting point disparity, imposing a cap on spending and avoiding anyone splashing out extravagantly. The advantages of this system are greater long-term financial stability, less debt and a greater attention paid to the managing of the breeding grounds. The price that will have to be paid for these advantages will be in terms of the entertainment, for we will no longer see "star-studded" teams.

4.- Neural networks and the problem of predicting sporting success

Neural networks and architecture constitute one of the more recent and most interesting fields of research, fields that began originally with the study and research of artificial intelligence, but gradually spread to include other sciences. The approach based on "neural networks" is referred to as connectionist and allows us to think about the phenomena of learning and memory, as will be seen further on. The early concepts of this new science, known as neuroinformatics, are attributable to McCulloch and Pitts and the fundamental idea behind their work was to attempt to reproduce the cerebral structure, founded on neurons, axons and dendrites using a mathematical model. Every neuron receives electrical impulses from dendrites and retransmits them via axons. It is therefore possible, in principle, to imagine constructing a minute model of a cerebral structure using logical portals, easily describable using the rules of Boolean algebra. The neuron, therefore, is modelled as a logic portal that has the goal of modifying and retransmitting the signal, obeying a specific rule. The transmission of the signal is dependent on several parameters: on the internal status of the logic portal, on the status of the previous portals and the signal received. The output is determined by means of an activation function that can be linear, non linear or threshold and that depends on the type of decision that the system has to simulate or logical operations that the system is called upon to complete. A quick comparison with the cerebral structure reveals that the human brain has 100 billion neurons and each neuron approximately 10,000 synapses or connections. The brain's extraordinary capabilities are down to

this enormous number of connections. Each neuron receives and processes information coming from other neurons producing an outgoing impulse that is sent, via the synapses, to the connected neurons. Synapses can be excitatory or inhibitory and every neuron is activated or inhibited depending on whether the overall stimulation does or does not exceed a certain threshold. An artificial neuron structure consists in a collection of nodes that make up the units of logical calculus (in a Boolean sense), connected by communication channels (synapses), that constitute the structure for storing data. Each neuron can have a g threshold and an s status. Synapses have a synaptic weight associated with them.

The system has three dynamic characteristics:

activation, learning and iteration.

The first updates the status of the neurons, the second alters the weight of the connections and the third regulates the order of activation. A neuronal network is capable of learning a pre-arranged model. It is said that to do this the network is trained so that the introduction of an input can result in a desired output or one that is consistent with the same.

The training consists of presenting the neuronal network with a combination of inputs and as a result modifying the synaptic weights in such as way as to obtain the outputs considered. The combination of models presented to the network during the learning phase is defined as a training set. The models used to confirm the level of learning are contained in the *validation set.*

The learning algorithms can be divided into two groups:

a) supervised;

b) unsupervised.

The first requires each input model to be associated with a desired output model. The training set therefore contains both lots of information. The network produces a calculated output for each model presented that is compared with that desired. Any error is transmitted back along the network, correcting the synaptic weights in accordance with a learning algorithm that tends to minimise the said error. The training of the network comes to an end when a level is achieved for the calculated error that is compatible with a certain confidence interval previously established.

Unsupervised algorithms within the training set, on the other hand, contain only input models. Learning algorithms modify the synaptic weights to produce output carriers that are consistent. The training process therefore extracts the statistical properties of the training set and groups similar models into similar classes. An interesting feature of neural networks is that of being able to discern and extract a model of a general nature, even where it is distorted by noises. The neural networks can also adapt flexibly to situations that are complex and changeable in time.

The EBP (Error Back Propagation) learning algorithm is the best known and the fastest learning algorithm for supervised networks. It has a multi-layered structure, that is to say it has hidden layers. Each neurone is

connected with that of the previous layers without horizontal connections. The EBP algorithm has two phases. In the first the signal is transmitted from the exterior towards the interior. In the second the direction is reversed.

A defined error can be calculated:

$E_{\square} = 1/2 \square\square\square(t_{\square j} - \square_{\square j})$

where $t_{\square j}$ e $\square_{\square j}$ indicate respectively the anticipated output and the calculated output of the nth neuron. The output calculated for a generic neuron is the function of the contribution of the neurons connected with it:

$\square_{\square j} = f_j(net_{\square j})$

with f generally assuming the shape of a sigmoid.

Net_{pj} represents the contribution of the associated neurons ponderated with synaptic weights:

$$net_{\square j} = \square_i \square_{ij} \square_{\square j}$$

The second phase consists in the correction of the synaptic weights with the aim of minimising the error.

Updating of synaptic weights follows this criteria:

$\square_p = \square\square\square_{\square j} \square_{\square j}$

with $\square\square$ defined as the level of learning.

The application of neural networks in finance affects a large range of problems, some of which are extremely complex. The capacity and the characteristics of the networks allow a whole series of applications, from the simplest to the most complex. An interesting aspect is that associated with classification. The classification properties of a neural network constitute one of the richest fields for possible applications. By comparing this with the traditional methods of classification (*Discriminant Analysis*), commonly used in financial statistics, it is possible to show quite clearly how the use of neural networks results in greater levels of efficiency.

The main aim of using neural networks in this work will be to determine, using the discriminatory capabilities of an appropriately trained neural network, those teams that have a greater potential for sporting success in the years to come. The indicator that describes sporting success is identified by using the level of growth of the value of the team as a whole. In order to obtain this result a database has been put compiled containing information on the financial aspects (costs, revenue, and investments), operational aspects and sporting aspects of the top twenty European teams. The database constitutes the knowledge base from which the neural network will extract its forecasts in the form of a discriminatory analysis. This

will allow us to attempt to forecast future successes on the basis of given variables of a varied nature, not just sporting but also financial and operational. For our purposes the sporting success is defined as "increasing in time of current value of the club". This analysis will also allow us, using the neural network, to identify those factors that are crucial for sporting success. We will in particular endeavour to respond to the question as to whether models based on "financial fair play" are effective and whether financial sustainability will become a limiter to both results and entertainment.

The following table summarises the values of some variable that are the subject of the analysis

Tab.1.- Some financial indicators of Top20 Football Clubs

	Revenue 2006 EuroMIL	Revenue 2007 EuroMIL	Revenue2 008 EuroMIL	Operating Income ($MIL)	Nu rse ry	Debt /Val ue	% Revenue Match DAY	% Revenue Mass Mesia	% Revenue Merchanidi se	Current Value ($MIL)	1-Year value change %
Real Madrid	276	366	351	81	10	23	23	32	45	1353	5
Manches ter United	246	325	315	160	10	54	42	29	29	1870	4
Barcelon a	208	308	290	108	10	7	32	38	30	960	22
Chelsea	221	269	283	-13	8	92	38	37	25	800	5
Arsenal	171	264	264	80	8	107	32	42	26	1200	0
Milan	234	210	227	58	8	0	16	59	25	990	24
Bayern Monaco	190	295	223	59	8	0	38	0	62	1110	21
Liverpoo l	181	211	199	50	9	59	27	42	31	1010	-4
Inter	177	173	195	27	9	77	20	58	22	370	-8
Roma	132	175	158	69	8	9	21	58	21	381	-12
Tottenha m	104	145	153	70	8	29	30	36	34	445	8
Juventus	229	168	145	46	9	5	10	54	36	600	18
Olympiq ue Lyonnais	93	156	141	94	8	18	22	49	29	423	4
Newcastl e	129	126	129	-13	8	96	41	32	27	285	-5
Hamburg	79	128	120	44	7	0	40	20	40	330	13
Schalke 04	97	148	114	41	7	38	24	17	59	510	9
Celtic	93	104	112	11	8	14	50	27	23	218	-4
Valencia	85	104	108	0	8	0	28	53	19	204	0
Olympiq ue Marseille	79	104	99	20	7	0	30	40	30	240	28
Werder Brema	79	104	97	27	6	0	40	20	40	292	12

5.- **The results of the Neural Classification and some closing considerations**

The following table highlights the results of the neural network forecasts

Tab 2.- Neural Network Forecasts of Future 1-Year value change %	
Real Madrid	5,0
Manchester United	4,7
Barcelona	5,8
Chelsea	6,6
Arsenal	7,3
Milan	7,9
Bayern Monaco	2,9
Liverpool	8,5
Inter	10,4
Roma	5,1
Tottenham	7,7
Juventus	7,6
Olympique Lyonnais	8,3
Newcastle	7,7
Hamburg	6,6
Schalke 04	6,0
Celtic	6,1
Valencia	7,7
Olympique Marseille	9,1
Werder Brema	8,2

As can be clearly seen, today's top teams show lower growth levels compared to the up and coming teams, as though a catching up mechanism has kicked in.

This results are very interesting. A first consideration concern the so called “financial fair play”. The neural network analysis show that financial sustainability of football clubs will not become a limiter to both results and entertainment, but will be an incentive to invest in nursery and to program in the long-term. It is easy to win by purchasing the best champions. But this policy is more expensive and not always effective. It is a myopic policy. The football market need of perspective policy to achieve the long run success.

A second consideration concern the critical factors of success in football market. A correct management of resources and a good technical competence is more important than the “intensity” of capital. In a period of financial crisis in all the world and in all the sectors this aspect is very important!

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Thursday, December 3rd

Session 4: STRATEGES IN SPORTS EVENTS
Chairman: Panos Pardalos (University of Florida, USA)

- ***On Optimal Betting Strategies for Multiple Sporting Eevents***
  Sergiy Butenko
  Professor of Industrial Engineering and Systems, Texas A&E University, USA

- ***Ambush Marketing at Sporting Mega-Events: a Typology of Strategies***
  Simon Chadwick
  Professor in Sports Business Strategies, Business of Sport, Convetry University, United Kingdom.

On optimal betting strategies for multiple sporting events

Sergiy Butenko (USA)

Abstract

This paper studies several betting strategies for a given set of multiple games, assuming that bets on the joint outcome of any subset of the considered games are allowed. The resulting optimization models take into account risk considerations and are stated as linear programming problems. We analyze the proposed models and report the results of experiments based on real-life data sets.

1. Introduction

The recent progress in information technologies spurred the growth in size and liquidity of betting markets. This makes the problem of designing appropriate betting strategies ever more important. In particular, developing optimal betting strategies is a key issue in answering the question regarding the economic efficiency of betting markets. In addition, due to similarities between the betting markets and other investment markets, the strategies developed for betting can be extended to other applications, and vice versa.

Mathematics of bookmaking in general and designing optimal betting strategies in particular have received a lot of attention in the literature. For example, in a classical paper, Kelly [3] developed a formula for determining the optimal with respect to long-run growth rate fraction f^* of the available budget to bet in a series of bets. For simple bets with two outcomes the Kelly bet is given by

$$f^* = \frac{P_p - 1}{P},$$

where P is the odds provided by the bookmaker (i.e., payoff on the bet) and p is the probability of winning. This formula can be extended to games with more than two possible outcomes.

In this paper, we consider a situation when for a given set of multiple games, a player is allowed to bet on the joint outcome of any subset of the games in question. We will refer to such a bet as a multibet. Recently, Grant et al. [2] studied this case using the utility function as the measure of performance. In particular, they considered the case of a log utility (Kelly) bettor, and proposed optimal betting strategies under two different forms of bookmaker take, proportion and multiplicative payout. As a consequence, they observed that with the multiplicative payouts, a Kelly bettor's expected payout for simultaneous bets is the same as for sequential bets.

In this paper, we deviate from the traditional use of utility functions in favor of Conditional Value at Risk (CVaR) performance measure, which allows for much more flexibility in modeling decision maker's risk preferences compared to the utility-based approaches. In addition, the models involving CVaR can be easily formulated within a linear programming framework and can be easily solved using modern optimization packages. We illustrate the value of our approach on some sample examples involving European soccer data.

The remainder of this paper is organized as follows. Section 2 provides definitions and notations used to describe the problem of interest mathematically. Section 3 introduces the concept of CVaR. Section 4 develops the optimization model to determine optimal betting strategies under the risk considerations. The proposed model is tested with real-life European soccer data in Section 5.

2. Notation

We consider n independent games in the set

$$G = \{1,2,..,n\}.$$

Let O^i denote the set of potential outcomes for game i, with each outcome expressed using a positive integer. For example, if G is a set of soccer games, then each O^i is given by

$$O^{\{i\}} = \{1, 2, 3\backslash\}, \qquad i = 1, .., n,$$

where 1 stands for the first team win, 2 stands for the second team win, and 3 stands for a tie.

We assume that we are given the probability of each outcome and the odds offered by a bookmaker (see, e.g., Table 1 in Section 5). We use the following notations to represent this data:

p_{ij} denotes the probability of outcome j ∈ $O^{\{i\}}$ for any game i ∈ G;

P_{ij} denotes the payout (odd) of a bet on outcome j ∈ $O^{\{i\}}$ for any game i ∈ G.

The player is allowed to place a multibet on any combination of the games in G, with the payout given by the product of the corresponding odds. Since the games are independent, the probability of a multibet win is also given by the product of probabilities of the corresponding outcomes of the individual games included in the multibet. The set of possible scenarios representing outcomes of all n games is denoted by S. Each scenario $s \in S$ is an n-dimensional vector, whose i^{th}component describes the outcome of the i^{th} game. In other words,

$$S = O^1 \times O^2 \times \cdots \times O^n = \{s = (s_1, \dots, s_n): s_{i\in} O^i, i = 1, \dots, n\}.$$

Then the probability p_s of scenario s realization is given by the product of the corresponding outcome probabilities:

$$p_s = \prod_{i=1}^{n} p_{is_i}, \qquad s \in S.$$

Similarly, by S' we will denote the set of available betting options for the set of games G. We assume that the player can place a multibet on any subset of games in G. We will represent any multibet, as well as bets on a single game, by an n-dimensional vector s', whose i^{th} component $s_i^{'}$ represents the outcome on which the player bids for the game i. If the game i is not a part of the multibet then $s_i^{'} = 0$. Therefore, the set S' can be described as follows:

$$S' = (O^1 \cup \{0\}) \times \left(O^{2\cup\{0\}}\right) \times \cdots \times \left(O^{n\cup\{0\}}\right) \setminus \{0 \in \Re^n\}$$

$$= \{s' = (s_1', \dots, s_n'): s_i' \in O^i \cup \{0\}, \ i = 1, \dots, n\} \setminus \{0 \in \Re^n\},$$

and the payout $P_{s'}$ for the betting option $s' \in S'$ is given by

$$P_{s'} = \prod_{i=1}^{n} P_{is_i'}, \qquad s' \in S'.$$

Finally, we use the notation $s' \leftarrow s$ to state that the multibet s' is winning under scenario$s$. This is the case if and only if all nonzero components of s' coincide with the corresponding components of s.

3. Conditional Value at Risk

Conditional Value at Risk (CVaR), also known as Mean Shortfall or Tail VaR, is a novel risk measure that was first proposed by Rockafellar and Uryasev in 2000 [5] and has gained a significant popularity during the last decade. This

popularity can be explained by its appealing intuitive meaning and attractive mathematical properties that include sub-additivity and convexity, making CVaR easy to optimize using modern convex optimization approaches. This is in contrast to the traditional and closely related Value at Risk (VaR) concept, which is defined as the maximum amount of loss for a given confidence level. Similarly, β-CVaR is defined as the expected loss under the β percent of the worst case scenarios, e.g, the average loss over a tail. More formal definition of CVaR for discrete distributions are given next.

Consider a set of n independent games in the set $G = \{1,2,..,n\}$ with $i = 1,2,..,n$ being the index set of the games, and S'represents the set of corresponding betting options as described in previous section. Let us define $x_{s'}$ to be the decision variable representing the fraction of available budget allocated to betting option $s' \in S'$. Denote by $f(x,s)$ the loss function associated with the decision variable x and the scenario s. In our case, the loss function can be naturally defined as the negative of the payout:

$$f(x,s) = -\sum_{i=1}^{n} P_{s'} x_{s'}.$$

For each x, the resulting distribution for the loss function $f(x,s)$ is given by

$$\Psi(x,\zeta) = P\{\omega: f(x,\omega) < \zeta\}.$$

Then the $\alpha - VaR$ of the loss associated with decision x is given by

$$\zeta_\alpha(x) = \min\{\zeta: \Psi(x,\zeta) \geq \alpha\}.$$

$\alpha - CVaR$ $\phi_\alpha(x)$ of the loss associated with the decision x is given by the mean of the α-tail distribution of $f(x,s)$, where the tail distribution function $\Psi_\alpha(x,\cdot)$ is given by

$$\Psi_\alpha(x,\zeta) = \begin{cases} 0 & \zeta < \zeta_\alpha(x), \\ \Psi(x,\zeta) - \alpha)/(1-\alpha) & \zeta \geq \zeta_\alpha(x). \end{cases}$$

Rockafellar and Uryasev [5,6] have shown that the $\alpha - CVaR$ $\phi_\alpha(x)$ can be calculated as

$$\phi_\alpha(x) = \min_{\zeta} F_\alpha(x,\zeta),$$

With

$$F_\alpha(x,\zeta) = \zeta + \frac{1}{(1-\alpha)} E\{[f(x,s) - \zeta]^+\},$$

Where $[t]^+ = \max(0,t)$.

Thus, in our case we have

$$F_\alpha(x,\zeta) = \zeta + \frac{1}{1-\alpha} \sum_{s \in S} p_s [f(x,s) - \zeta]^+.$$

This formulation can be used within a linear programming model, as will be shown in the next section.

4. Optimization model

Our decision variables are given by a vector x of length $|S'|$, where for each $s' \in S'$, $x_{s'}$ denotes the fraction of the available betting budget allocated to the multibet s'.

Recall that the risk function is given by the negative of the payout corresponding to the scenario s,

$$f(x,s) = -\sum_{s':\, s' \leftarrow s} P_{s'} x_{s'}.$$

Our objective is to maximize the expected payout resulting from allocation given by x:

$$\max\ z(x) = \sum_{s \in S} p_s\, f(x,s).$$

The $\alpha - CVaR$ constraints for the defined risk function are given by

$$F_\alpha(x,\zeta) \leq \beta,$$

and can be linearized by introducing additional variables η_s as follows [6]:

$$-\sum_{s':\, s' \leftarrow s} P_{s'} x_{s'} - \zeta - \eta_s \leq 0, \qquad \eta_s \geq 0, \qquad s \in S;$$

$$\zeta + \frac{1}{1-\alpha} \sum_{s \in S} p_s \eta_s \leq \beta.$$

The budget constraint

$$\sum_{s' \in S'} x_{s'} = 1$$

states that all the budget allocated for betting should be distributed among the available betting options. Finally, the nonnegativity constraints are required for the decision variables:

$$x_{s'} \geq 0, \qquad s' \in S'.$$

5. Computational experiments

We test the proposed model on a set of three UEFA Champions League soccer games played recently. The corresponding data is given in Table 1. We used AMPL with MINOS solver for numerical experiments [1]. It should be noted that Portfolio Safeguard, a commercial software available from American Optimal Decisions (http://www.aorda.com/) provides the most convenient implementation framework for models similar to ours, since it supports risk measures like CVaR as built-in functions.

Table 1: Predictions and odds for two UEFA Champions League games played on September 17, 2009 according to [4].

#	Games	Prediction	Odds	Score

i	Home vs Away	1	3	2	1	3	2	
1	Inter Milan vs Barcelona	0.32	0.30	0.38	3.09	3.32	2.60	0:0
2	Dynamo Kyiv vs Rubin Kazan	0.47	0.29	0.24	2.10	3.44	4.00	3:1
3	Sevilla vs Unirea	0.81	0.14	0.05	1.22	6.90	18.00	2:0

Here we report the results of solving our model for several different choices of parameters α and β defining the CVaR constraints.

Since the considered games have already been played, we can test our results against the outcomes and make conclusions about the performance of our approach in real-life settings. In our example, the number of scenarios is equal to 27, and the number of betting options is given by 63. With $\alpha = -\beta$ =0.9 , we obtain the following results: 9.15% of the budget are bet on the draw in game 1, and the remaining budget is distributed among the different outcomes for game 2, with 29.13% placed on Inter Milan win, 34.62% placed on Barcelona win, and the remaining funds bet on the draw in this game. The corresponding payout is equal to 0.9 for 18 of the scenarios and to 1.21476 for the remaining 9 scenarios. This yields the expected payout of 0.99128. The payout is equal to 0.9 for the scenario that realized. With α = 0.5 and β =-0.95, we obtain similar results with the expected payout of 0.99093 and again 18 scenarios yielding the payout of 0.95 and the remaining scenarios yielding the payout of .09113. Interestingly, the tighter risk constraint results in only minor change in the expected objective and the actual payout is, in fact, better than before, increasing to 0.95. These trends continue as we keep decreasing the CVaR bound until the model becomes infeasible, at which point the solver outputs some infeasible solution found. The constraints that are typically violated are the CVaR constraints, hence the solutions found can still be used if the bettor is willing to take some extra risk compared to what was specified in the model. As our experiments show, in some cases taking such a risk may be worthwhile.

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Ambush marketing at sporting mega-events: a typology of strategies.

Simon Chadwick (United Kingdom)

Trends in sponsorship

As official sport sponsorship has grown, and developed in importance and sophistication over the past three decades, so too have the efforts made by un-associated brands to capitalize on the financial benefits and media value provided by sport. The need for marketers, sponsors, and officials to acknowledge, understand, and defend against ambushing has been magnified by the staggering growth of sponsorship investment over the past twenty-five years. This paper therefore examines where we are right now with ambush marketing, presenting a new conceptualization of the phenomenon, and proposing a new typology of ambushing strategies. The research upon which it is based has sought to explore the managerial implications of ambushing for sponsors and commercial rights holders, and thus contributes to a better understanding of how to management and protect official sponsorships.

Following a restructuring in the International Olympic Committee (IOC)'s sponsorship programme by organizers of the 1984 Los Angeles Summer Olympics, ambush marketing emerged as a significant threat to sport sponsorship, providing marketers with a means of associating with sport properties and event commodities such as the Olympic Games and the FIFA World Cup, without contributing financially to the properties in order to secure any official association. By offering would-be sponsors an alternative means of associating with an event, without substantial expense, ambush marketing has therefore emerged as a major threat the investments made by official sponsors, potentially devaluing sport sponsorship by cluttering the marketing environment surrounding sponsorship.

These concerns are of particular importance for sport sponsors and commercial rights holders, as the investment made by sponsors – and the revenue generated by event organizers – have grown exponentially over the past twenty-five years. Global sponsorship spending in 1984 amounted to approximately $2 billion[1]; more recent estimates of sponsorship investment in the United Kingdom alone project sponsorship expenditures to surpass £1 billion in 2009, with projections forecasting a further rise in the run-up to the 2012 London Olympic Games. In total, the 2008 international sponsorship industry was calculated to have been worth $43.5 billion[2], a growth of $19.1 billion over the previous six years. Moreover, marketing expenditures in leveraging and promoting sponsorship are generally agreed to have at least equaled, if not exceeded, the amount spent securing rights, meaning that sponsorship's overall estimated market value may amount to nearly $100 billion per annum.

Changes to the management of sponsorship rights and the way in which they are being protected have accordingly seen contract values grow considerably over time, making sponsorship a major contributor to sport rights holder's revenues. The development of corporate sponsorship programmes by FIFA (Fédération Internationale de Football Association) at the 1982 World Cup and the IOC at the 1984 Los Angeles Olympics gave rise to category exclusivity and commercial rights bundling in sponsorship, which have been key drivers in sponsorship's subsequent growth. For the 1988 Olympic Games in Seoul, South Korea, Coca-Cola spent $22 Million to become the exclusive drinks-category sponsor[3]; estimates from last summer's Games in Beijing have major sponsors, including Coca-Cola, paying three times that amount, with sponsorship investment for major events projected to rise even further as London 2012 approaches. As a result, the IOC has estimated that sponsorship revenues account for 40% of total IOC turnover, with similar shares reported by other global sport governing bodies[4].

Previous research

In the sponsorship literature, ambush marketing research has emerged over the past twenty years as an area of considerable interest, characterized by four predominant themes: (i) an identification of what ambush marketing is, and its aims and objectives[5]; (ii) the use of consumer-based measures of ambush marketing's impact on sponsorship, such as post-event consumer recall sponsorship studies[6]; (iii) the discussion of the ethical concerns surrounding ambush marketing and the morality of ambush campaigns[7]; and (iv) an exploration of the legal implications of ambush marketing efforts, and the measures available to sponsors and rights holders to combat ambush marketing[8]. Despite the advances being made in our understanding, ambushing nevertheless remains a largely underdeveloped field in need of further investigation and analysis.

Recently, ambush marketing research has shifted focus, utilizing qualitative methods to produce case study analyses and interviews rather than simply establishing consumer recall. Such an approach has enabled the renewed investigation of what constitutes ambush marketing, and revealed further insight into how ambush campaigns are perceived within the sport sponsorship community. Perhaps most important, suggestions of ambush marketing's role as a factor in – and contributor to – marketing clutter, has raised greater concern over the impact of ambushing on sponsorship, and the proliferation of marketing and sponsorship opportunities surrounding major sporting events[9].

Despite providing an initial understanding of ambush marketing, a number of criticisms can be made of ambush marketing research to date: first, while a number of counter-ambushing methods have been proposed[10], these strategies have yet to be meaningfully tested or explored, save those involving legal or legislative protection. Likewise, although the discussion of ambush marketing is deeply rooted in discussions about sport sponsorship, there is a dearth of research into the actual impact of ambush marketing, from a practical, managerial, or strategic perspective. Finally, and most disconcertingly, no definitive understanding of ambush marketing exists, and recent developments in sport marketing have raised renewed concerns over the actual impact of ambushing can have on sponsors. Moreover, it is still not entirely clear what specifically constitutes ambush marketing. Indeed, our common understanding of ambush marketing appears to be based on definitions proposed twenty years ago. Such definitions offer only a limited perspective of the aims, motives, and uses of ambush marketing as a marketing communications tool.

As sponsorship has grown and ambush marketing has emerged, the academic study of ambushing has nevertheless developed as a major, contemporary issue that sponsorship research needs to address. Unfortunately, to date no satisfactory conceptualization of ambush marketing exists, and our understanding of ambushing is grounded in studies conducted two decades ago. These studies do not adequately represent the evolution of ambushing, and ensuing and associated concerns and issues, over the past twenty years. In order to address these limitations, this study therefore focuses on adding value to our understanding of ambushing, analyzing the methods and strategies prevalent in ambush marketing practice, and creating a unique typology of ambush marketing, proposed herein.

Research method

In order to look deeper into the problems and issues raised within the existing research base, and to address the outdated and – sometimes irrelevant – view of ambushing taken in past research, a two-stage research process was undertaken.

The first phase of research was the creation and development of a database of reported ambushing incidents. Based on an in-depth documentary analysis, this provided a unique historical perspective on ambush marketing attempts, and the subsequent counter-ambushing strategies that sponsors and/or property owners have taken. Given the nature of ambush marketing, the largely underdeveloped theoretical body surrounding ambushing, and its substantial media presence around major sporting events – particularly given the growing importance of sport sponsorship – the use of print and news media, as well as a number of first-hand observations and accounts of ambushing, provided an initial framework for the study.

The document analysis undertaken drew from more than 1000 sources relevant to the study of ambush marketing, guerrilla marketing in sport, parasitic marketing, and sport sponsorship. The sources used were predominantly English- and French- language news items, as well as a collection of German and Polish sources, drawing on the languages spoken and understood by the research team. The works analyzed included print media, web-based news sources, legal documentation, television advertising media, as well as peer-reviewed journal articles and collected ambush marketing visual materials. Rather than providing a detailed review and analysis of the content of the collected pieces, the aim of the document analysis was to create a database of incidents of legitimate event sponsorship ambushing. As such, throughout the analysis, dates, events, official event sponsors, ambushers, and the strategies taken both to ambush the event, and to protect against ambushing, were noted, resulting in 350 detailed cases included in the initial database (See Table 1 for sample entries).

Table 1: Ambush Marketing Case Database (Sample)

Year	Event	Ambusher	Ambushee	Tactic employed Counter-measures taken
2008	Summer Olympics: Beijing, China	Gatorade (PepsiCo)	Coca-Cola	Gatorade ran a television spot featuring Chinese athletes counting down to 2008; the ad concluded with a group of children, aged approximately 7-10, in a large Olympic-training style centre playing table tennis counting down to 2012 and 2016
2006	FIFA World Cup: Germany	Bavaria Brewery	Budweiser	Stadium officials forced fans to remove Bavaria's promotional wear – orange lederhosen promoting Bavaria – and watch the game in their underwear.
1996	UEFA Euro 1996: England	Nike	Umbro	Nike purchased all poster space/advertising sites in and around Wembley Park tube station as a means of promoting the brand during the event; these actions sparked UEFA's pre-emptive measures taken for Euro 2000 and tournaments since (renting all advertising media within 1-3km radii of venues).
1992	Summer Olympics: Barcelona, Spain	American Express	Visa	American Express ran advertisements correctly stating that visitors to Spain 'don't need a visa'; Visa took no official action, and American Express publicly defended their advertising campaign as legitimate and not ambushing.
1984	Summer Olympics: Los Angeles, CA	Nike	Converse	Nike developed murals near the Olympic Games sites featuring Nike-sponsored track athletes, visible from within the Los Angeles Olympic Coliseum, resulting in 42% of American's confusing Nike as an official sponsor of the Games.

It is important to note that, for this study only those instances of ambush marketing whose impact on sponsorship is most of interest, have been included. Most major sporting events (such as the Olympics or the World Cup), employ ambush marketing protection teams to investigate often hundreds of potential ambush marketing cases, many of which are simple intellectual property rights infringements, involving the use of trademarks, copyrights, the unlawful manufacturing of merchandise, or the illegal re-distribution of tickets. While cases such as these are of obvious interest to event rights holders, their impact on sponsorship is generally minimal, and can easily be dealt with using cease and desist letters, or the enforcement and protection of an organization's intellectual property. In order to properly assess and understand the nature of ambush marketing as related to sponsorship, for this study only those cases involving the ambushing of direct competitors, incidents drawing international media coverage, multi-national promotional campaigns, or those attempts which garnered preventative or reactionary counter-ambushing efforts were included.

The second phase of research consisted of a series of semi-structured interviews with industry professionals and academic researchers, exploring their knowledge and opinions of ambush marketing, and their perception of its place in marketing. Respondents were selected based on experience, either direct or indirect, with ambush marketing at both the strategic and tactical levels, across a variety of sports, in the defense against ambush tactics, or past research on the subject. In total, twelve respondents completed interviews, in which they detailed their experiences of sponsorship and ambush marketing. Interviewees were also asked to define ambush marketing based on their experiences, and to explain in detail the methods, tactics, and strategies used by ambushers, sponsors, and events rights holders, in relation to ambush marketing.

The interviews employed a grounded approach aimed at generating an insight into practitioner perspectives on ambushing. Responses were recorded when permitted, and subsequently transcribed, allowing each to be coded and analyzed, adding further detail to the study. Key themes, such as the nature of ambush marketing, the parallels between marketing and law present in ambush practices, and issues surrounding its legitimacy and the authority of sponsors, guided the interviews, and provided a useful platform in further analyzing the case database created.

The Evolution of Ambushing

In re-examining the history of ambush marketing through the case database, an evolution in the tactics used, the counter-measures taken, and the communications media available to ambushers is apparent. As with sponsorship, whose growth and development over time has been well-documented[11], so too has ambushing evolved since its emergence in the 1980s, driven by technological advancements and the growing financial importance of sport marketing. While television advertising continues to be a main vehicle for ambush campaigns during major events, the internet has recently grown into a notable marketing platform for non-sponsors, and offered new and unexplored opportunities for marketers. The appeal of ambushing for companies has only heightened over time, due to the high-cost, undefined-reward environment that typifies sport sponsorship, further emphasizing the challenge facing sponsors.

Also influencing ambush marketing's changing nature have been the counter-ambush mechanisms used by rights holders, an indication of the moderate success enjoyed by event organizers in combating ambush marketers. The earliest tactics employed by ambushers took advantage of easily identifiable and available marketing opportunities being passed over by official sponsors, including signage near event sites and event broadcast sponsorship. However, given to the efforts of sponsors and rights holders to better protect sponsorship, the availability of such opportunities has waned. The IOC, in negotiating television broadcast rights with media partners, now restricts the use of the term 'broadcast sponsor' within

their broadcast agreements, obliging broadcasters to police their own advertising partners. UEFA (Union of European Football Associations) have taken broadcast sponsorship protection a step further, buying and controlling all advertising time during matches, and allotting the time to sponsors. As a result, sponsors are not only protected from potential ambush campaigns, but are also forced to better leverage their investment.

Moreover, UEFA have also spearheaded the use and enforcement of marketing exclusion zones surrounding stadia and event host sites, as a result of Nike's Euro 1996 and 1998 FIFA World Cup promotions. These exclusion zones have also been implemented by the Olympics, and are now seen as a required element of any Olympic-host bid, as part of anti-ambush marketing legislation. These exclusion zones have forced ambushers to become more creative and encouraged greater planning for larger, more ambitious ambush campaigns. While ambushing has infrequently been strategically managed, these mechanisms have forced ambush marketers to plan better and commit greater time and resources than ever before, to successfully ambush events. For rights holders and sponsors, though, the growing number of ambush marketers, as well as the increased media attention given to ambushing since the 2006 FIFA World Cup, is evidence of ambush marketers' willingness to adapt to these counter measures. Among the methods employed for more recent sporting events, online promotions, viral marketing campaigns, off-site giveaways, and increasingly creative and legally-conscious campaigns, have all served as alternatives to early ambush media, challenging the creativity and authority of official sponsors.

The Practitioner's View

The evolution of ambush marketing evidenced in the database is also reflects in the views and experiences of sponsorship practitioners in regards to ambushing. A number of recurring themes emerged from the definitions offered by respondents, including an emphasis placed on the role of authority, intended association, and the broad range of techniques used. Most interestingly, each of the respondents – when asked to describe ambush marketing in their own words – re-iterated the difficulty practitioners face in defining ambushing, noting the broad area of activities and tactics used, and the generally broad, grey area that an ambush marketing definition must cover.

One participant defined ambushing as "a company conducting marketing activity around a sports property… which creates in consumers' mind a link to the event… including a broad spectrum of behaviors and activities". The allusion to the multitude of activities included in ambushing was echoed by other respondents, who variously noted that: "you can't limit it to any one medium" and "no one sentence can define it". Another definition put forward, "gaining media exposure for an event for you that you haven't purchased the official rights", highlights the emphasis placed on exposure and awareness by many.

Two interviewees, in response to questions regarding their awareness of ambush marketing as it impacts sponsorship and commercial rights values, stated explicitly that while ambush marketing can pose certain logistical and managerial issues for rights holders, ambush marketing is nevertheless indicative of a valuable property, and as such is not entirely unwelcome. Interestingly, while the interviewees agreed that sponsors must leverage better their investments, and capitalize on the marketing opportunities available to them, each of the respondents stressed the view that sponsorship protection and the defense against ambush marketing is the responsibility of the rights holder, in order to protect investments and justify rising sponsorship costs, rather than that of the sponsor.

Ultimately, the consensus among respondents was an inherent difficulty in summarizing ambush marketing in concise terms, instead referring back the various goals or objectives set, the wide array of tactics available, and ambushing's unlimited scope in terms of reach and applicability. Given this uncertainty, and based on an analysis of the case database and interviews conducted, we propose a new definition of ambush marketing. In many ways, given the more capitalistic nature of ambush marketing today described by respondents and witnessed in the case database, 'ambush' marketing as a title may be somewhat misleading; rather, the French 'pseudo-parrainage', or pseudo-sponsorship, is perhaps more applicable. Nevertheless, in re-envisioning ambush marketing communications today, the following definition is proposed:

"Ambush marketing is a form of associative marketing which is designed by an organization to capitalize on the awareness, attention, goodwill, and other benefits, generated by having an association with an event or property, without the organization having an official or direct connection to that event or property."

Re-Visiting Ambush Strategies

As well as disputing ambush marketing's nature, past studies on ambush marketing have equally attempted to identify the key tactics or techniques used by ambushers in attacking sporting events and sponsors. Past examinations of ambushing have previously revealed five marketing opportunities typically used by ambushers, categorizing ambush campaigns into the following: sponsoring the broadcast of an event; sponsoring subcategories and leveraging this sponsorship aggressively to overshadow competitor sponsors; buying advertising time surrounding event broadcasts, before and after official telecasts; aligning major promotions, not sponsorship related, with an event and actively leveraging those promotions; and the use of alternative creative means – highlighting the innovation and dynamism of ambushers, and the plethora of opportunities to ambush events available[12]. Unfortunately, despite underlining ambush marketing as a marketing communication vehicle for future studies, this breakdown reflected an early view of ambush marketing, directly related to a competitor's event sponsorship, and limited in scope as compared to more recent efforts.

As such, an updated and expanded categorization was proposed, reflecting the change in ambush marketing tactics over time[13]. As well as including the sponsorship of event broadcasts and the use of television advertising time surrounding an event as previously noted, a further five potential ambush avenues were identified: the sponsorship of associated entities (other than the organizers/rights holders); the use of advertising media near/in proximity of the event/venues; advertising using a theme or implied association; creating a competitive attraction to distract from the event; as well as suggesting the accidental ambushing of an event due to a lack of diligence on the part of the organizer. This categorization, as with preceding attempts within sponsorship literature, emphasized above all the marketing opportunities available to ambush marketers, as well as providing a new look at ambushing's reach as a marketing vehicle.

Based on these categories, a number of comments need to be made; as previously noted increasingly in sport broadcast agreements, rights holders are broadcast sponsorship availability, and protecting sponsors more actively. The IOC, in an effort to protect against this form of ambush, now stipulates within their broadcast contracts that media partners regulate advertisements more strictly, and prohibit the use of the phrase 'broadcast sponsor', and variations thereof. Similarly, UEFA, as part of their sponsorship package, purchase all advertising time during their event broadcasts and distribute that time to their sponsors, stopping any broadcast sponsorship ambushing and forcing sponsors to better leverage their associations.

Likewise, based on UEFA's experiences at the 1996 European Championships (and the subsequent 1998 FIFA World Cup), the use of advertising media in and around host venues is now strictly policed by event organizers and local governments, thanks to the advent of marketing exclusion zones surrounding stadia, and the enactment of ambush marketing legislation in Olympic host cities. However, despite the advancement and continued progression of counter-ambush marketing measures, the growth of ambush as a communication tool has only been accelerated, thanks in part to the growth of new media, the remarkable growth of the sport marketplace, and the sophistication of sport sponsorship. While broadcast sponsorship – for the biggest sporting events – is now largely protected against, other opportunities have emerged, and new methods developed. Rather than listing more recent or contemporary efforts taken by ambushers as categories in the same way as those proposed before, a typological approach has been taken to conceptualizing modern ambush marketing, addressing the fundamental lack of a theoretical conceptualization that has restricted ambush marketing research to date.

For example, in the previous categorizations attempted, all broadcast sponsorship efforts are grouped as one[14]; within this new typology, the distinction is made between sponsors of a member association or club leveraging their tie to an event, and the efforts of a direct competitor of an official sponsor purposely ambushing their rival in an effort to devalue their sponsorship and mislead consumers. As such, this typology is less a categorization of the marketing communications opportunities available to ambushers (e.g., broadcast sponsorship, outdoor advertising media, promotional giveaways), and rather forms a unique perspective on the various objectives and implications of ambush campaigns, the themes and tactics used by ambushing parties, as well as a critical examination of the relationship between ambush marketer and official sponsor.

By analyzing the database created and the practitioner interviews undertaken, eleven newly created types of ambush have been identified, ranging from the direct attack of one organization on a rival, to the unintentional association of a company with an event due to reputation or past marketing efforts (See Table 2). Critically, this typology draws on and evolves earlier studies on ambushing, and includes a number of the same general themes. However, this new typology better reflects the managerial considerations and underlying marketing communications planning taken by ambush marketers, and focuses less on grouping together efforts in broadly descriptive categories. The eleven types of ambushing identified are further divided into three categories – direct ambush activities, indirect or associative ambushing, and incidental or un-intentional ambush attempts – further highlighting the different strategies, motives, and measures used by non-sponsors to develop an attachment to an event.

Table 2: A typology of ambush marketing

	Ambush Strategy	Definition	Case example	Number of cases observed in the database
DIRECT AMBUSH ACTIVITIES	***PREDATORY Ambushing***	The deliberate ambushing of a market competitor, intentionally and knowingly attacking a rival's official sponsorship in an effort to gain market share, and to confuse	**Heineken, UEFA European Championships, 2008** Heineken, in an effort to ambush Carlsberg's official sponsorship, created	**34**

		consumers as to whom is the official sponsor	marching band-style "Trom-Pets" (drum hats) for Dutch fans on their way to Bern which also acted as drums, branded with the Heineken logo and name; the company released advertisements featuring Dutch fans travelling to Switzerland, visiting the official Oranje fans camping complex, and Heineken marketing executives plotting ways to ambush the European Championships	
	COAT-TAIL Ambushing	The attempt by an organization to directly associate itself with a property for the purpose of ambushing through a legitimate link, such as the sponsoring of participating athletes, or of a participating team or association, without securing official event sponsor status. Not to be confused with the oft-used term 'piggy-backing'; while piggy-backing implies acceptance or complicity, coat-tail ambushing refers to the association of a company to an event for the purpose of associating with the property	**Nike, Beijing Summer Olympics, 2008** Following Liu Xiang's injury in the men's 110m hurdles, Nike released a full-page ad in the major Beijing newspapers featuring an image of the disconsolate Liu, a Nike-endorsed athlete, and the tagline: 'Love competition. Love risking your pride. Love winning it back. Love giving it everything you've got. Love the glory. Love the pain. Love sport even when it breaks your heart.'	**89**
	PROPERTY INFRINGEMENT Ambushing	The intentional use of protected intellectual property, including trademarked and copyrighted property such as logos, names, words, and symbols, or knowingly infringing on the rules and regulations of an event, in a brand's marketing as a means of attaching itself in the eyes of consumers to a particular property or event	**Unibet, UEFA European Championships, 2008** Betting company Unibet released a series of magazine advertisements in Polish magazine Pitkanonza for online betting on the European Championships, explicitly featuring the words 'Euro 2008' and football in their adverts	**47**
ASSOCIATIVE AMBUSH ACTIVITIES	***SPONSOR SELF-Ambushing***	The marketing communications activities by an official sponsor above and beyond what has been agreed in the sponsorship contract, effectively ambushing the property which they support, and infringing upon other official sponsors	**Carlsberg, UEFA European Championships, 2008** Official sponsor Carlsberg extended its promotions beyond the scope of their sponsorship rights, effectively ambushing the other sponsors by going beyond their contractual allowances; as well as their in-stadium	**8**

			promotions and signage, Carlsberg also gave away headbands to fans during the tourney, sporting fake team-colored hair; in the fan zones surrounding the stadium, Carlsberg gave away t-shirts to fans with the Carlsberg marks for those visiting the brand's promotional booth	
	ASSOCIATIVE Ambushing	The use of imagery or terminology to create an allusion that an organization has links to a sporting event or property, without making any specific references or implying an official association with the property	**Nike, Beijing Summer Olympics, 2008** Throughout their 2008 summer marketing, Nike made considerably use of the number 8, a symbol of luck and fortune in China, as well as a symbol for the Games (whose start date was 08.08.08). Nike use similar design patterns in several shoes and items of clothing, using the number 8, as well as drawing comparisons to the Beijing Olympic Stadium 'Birds Nest' design, and the five rings logo	**84**
	DISTRACTIVE Ambushing	The creation of a presence or disruption at or around an event in order to promote a brand, without specific reference to the event itself, its imagery or themes, in order to intrude upon public consciousness and gain awareness from the event's audience	**Bentley, The Open Championship, 2008** Bentley set-up a row of cars prominently displayed outside Hillside Golf Club, directly adjacent to Royal Birkdale, the host course of The Open, a means of attracting interest and, in term, deterring from Lexus' official sponsorship of the event	**12**
	VALUES Ambushing	The use of an event or property's central value or theme to imply an association with the property in the mind of the consumer	**Puma, European Championships, 2008** Advertised their football line during the spring and summer with the slogan "JUNE 2008: TOGETHER EVERYWHERE" - a direct reference to the European Championships being played that month, and the underlining themes of unity and anti-racism of the tournament	**10**
	INSURGENT Ambushing	The use of surprise, aggressively promoted, one-off	**K-Swiss, French Open - Roland Garros, 2008**	**56**

		street-style promotions or giveaways, at an event, in order to maximize awareness, while minimizing investment and distracting attention away from official sponsors and the event itself	K-Swiss ambushed rivals Adidas and clothing sponsor Lacoste in a one-off guerrilla marketing ploy, setting up an enormous purple K-Swiss branded tennis ball on top of a crashed car, along a major route to Roland Garros	
	PARALLEL PROPERTY Ambushing	The creation of, or sponsorship of, a rival event or property to be run in parallel to the main ambush target, associating the brand with the sport or the industry at the time of the event, thus capitalizing on the main event's goodwill	**Nike Human Race, International, 2008** Nike organized a global 'counter-event' called 'The Human Race', being run in 24 cities across the world - including Shanghai - starting 7 days following the Olympics and featuring massive international marketing throughout the Olympics centered around Nike and the marathon	**17**
INCIDENTAL AMBUSH ACTIVITIES	***UNINTENTIONAL Ambushing***	The incorrect consumer identification of a non-sponsoring company as an official sponsor, unknowingly or inexplicitly, based on a previous or expected association with an event	**Speedo, Beijing Summer Olympics, 2008** Speedo earned considerable media attention throughout the Beijing Games as a result of the success of swimmers in their LZR Racer swimsuits, resulting in the brand being identified as a sponsor and cluttering the market	**7**
	SATURATION Ambushing	The strategic increase in the amount of marketing communications around the time of an event by a non-sponsor in order to maximize awareness of the brand during the event, aggressively marketing the brand around an event, and maximizing the use of available advertising before, during, and after, the broadcast	**Lucozade, Beijing Summer Olympics, 2008** Lucozade, during the Olympic Games, aggressively promoted their brand through print and television adverts, above and beyond their standard marketing, prominently featuring athletes and a variety of sports, in line with the Olympics	

N.B. **Direct ambush activities** are defined as the intended, targeted association of a brand (by an ambusher) with an event or property, through a clear, an explicit reference or an intended connection to the ambushee;

Indirect ambush activities are defined as the association of a brand with an event or property, through suggestion or indirect reference, drawing on the awareness and attention of consumers surrounding an event, without express reference

or attachment to the property; **Incidental ambush activities** are defined as the presumed association of a brand with an event or property, without that brand establishing a clear, explicit or intended connection.

Throughout discussions with interview participants and the analysis of past ambush marketing incidents, the eleven types of ambushing reflect a more varied understanding of the aims of ambushers than previously suggested, but also highlights the confusion in identifying what defines ambush marketing. While invariably individual ambushing organizations will have different motives and objectives behind their campaigns, the ultimate impact of their efforts on sponsorship and event-linked marketing has historically been the defining factor in determining ambush marketing. As such, sabotage marketing or promotional giveaways outside a sporting event, while not directly attacking or impacting sponsorship in the majority of cases, nevertheless impacts upon consumer awareness and brand image transfer, thus negatively influencing sponsorship effectiveness.

Moreover, whereas previously ambush marketing's primary aim has been seen as a means of confusing consumers as to whom officially sponsors an event, or to detract from an official sponsorship's media awareness and derive the same brand association benefits as official sponsors, contemporary ambush marketing appears to have evolved into a marketing communication vehicle unto its own. Undoubtedly, in the case of major competitors such as Nike v. adidas, Pepsi v. Coca-Cola, or American Express v. Visa, history has shown that influencing sponsorship success has been and continues to be an element of ambush marketing However, as one sponsorship executive noted, "ambush marketing is client dependent, and is seen as a different approach to marketing, an opportunity parallel to sponsorship".

In this light, ambush marketing can be viewed as an alternative to sponsorship for companies, depending on their budget, interests, and brand image; for some organizations, taking a more bold, daring approach to marketing their products or services, utilizing unauthorized and defiant means such as ambushing, represents an alternative means of gaining some of the same benefits of association with an event as sponsorship, while maintaining a connection with their own brand ethos. Throughout the database, certain trends are readily apparent in analyzing those companies actively ambushing, and those sponsors commonly impacted. Less conventional, more trendy and anti-authoritarian brands, such as those emphasized by companies like Nike and Pepsi, appear significantly more likely to ambush sporting events, as compared to their more official-sponsorship focused rivals Coca-Cola and adidas.

However, this new typology presents one particular newly emergent trend in sport marketing, the pre-emptive ambushing of a rival by an official sponsor, which has shifted power away from traditional ambushers. While few cases exist to date, adidas' marketing activities at the 2008 UEFA European Championships represent an acute awareness of the threat posed by competitors Nike and Puma, and a move towards claiming full benefits of their sponsorship association. While not all official sponsors can be expected to pre-emptively attack known ambushers so blatantly, using ambush marketing techniques to combat ambush marketing is a development worthy of greater investigation.

IMPLICATIONS & CONCLUSIONS

The aim behind such a typology is to better understand the process and management practices behind ambushing, as a means of better protecting sponsorship and defending against ambush campaigns. While identifying tactics used in the past – such as broadcast sponsorship – has raised awareness of the threat of ambushing and given rise to possible counter-ambush attempts, the continued confusion regarding what constitutes ambush marketing and how to cope with

ambush marketing has underlined the need to better assess which campaigns legitimately threaten sponsorship, and to what degree.

In examining past ambush campaigns from the database, collected within the context of this new typology, a distinct shift in paradigms is evident; whilst early in ambush marketing's history, predatory and coat-tail ambush strategies were most prominent, more recently ambush marketing has taken a decided emphasis on associative marketing and the overall capitalization on the value of sporting events. Cases from the 1980s through to the mid-1990s appear to represent a clearer and better-defined competitive relationship between ambusher and ambushee, with a number of attacks explicitly attacking a rival's sponsorship (such as American Express's 'You don't need a visa' Olympic-themed campaigns). However, more contemporary examples, perhaps in line with the dramatic increase in sponsorship value over time, a more indirect, opportunistic approach now more accurately describes ambush marketing.

The emergence of relatively new and unexplored ambush tactics, such as value-based ambushing and self-ambushing, re-affirm the value associated with these mega-sporting events, and the potential benefits sought by organizations recognizing this worth. Brands, this shift would seem to indicate, have taken a much stronger focus on gaining and encouraging some benefit from a presumed association with an event, in place of early suggestions that ambushers sought primarily to detract from sponsorship and negatively impact a sponsor's returns. While in some cases this is surely still a main focus, in capturing attention and drawing consumer awareness away from sponsors, ambushers are ultimately affecting the activities of sponsors, our findings point away from intentional confusion and distraction, towards a broader, more opportunistic and benefit-driven perspective of ambushing.

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FINANCES AND MANAGEMENT IN FOOTBALL

Chairman: Lorenzo Gascon (Real Academia de Ciencias Económicas y Financieras, Spain)

- ***The Finances of the Top 10 of European Football***
  José Mª Gay de Liébana Saludas
  Professor of Financial Economics and Accounting, Universitat de Barcelona, Spain

- ***How to Detect the Stars of Tomorrow. The case of Football-Dreams***
  Sandro Rosell Feliu
  Ex Vice- president of the FC Barcelona, Spain

The Finances of the Top 10+1 European Soccer Clubs

José Mª Gay de Liébana y Saludas (SPAIN)

The first ones of european soccer by invoicing

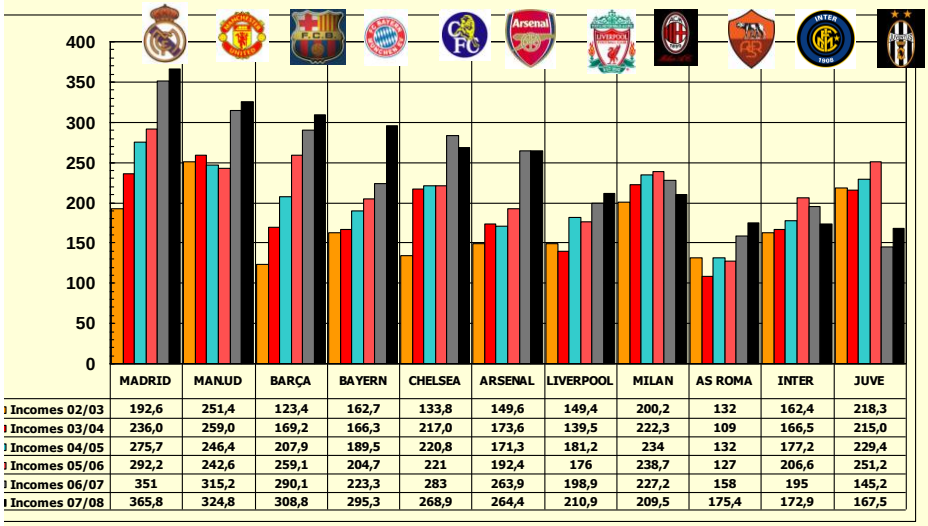
Within the Top 20 of European soccer clubs, the head group, the Top 10 of European soccer, it is integrated during the past few years by four English clubs: **Manchester United, Chelsea, Arsenal and Liverpool**; three Italians plus a forth: **AC Milan, Inter Milan, Juventus and AS Rome**; two Spanish: **Real Madrid and FC Barcelona**; and a German: **Bayern de Munich**.

Among them (**10+1, by the case of the Juventus**) they added in **2007/08** a invoicing of **2.764, 2 MM€** equivalent to **19%** of all the income of European soccer (**14.600 MM€**).

Of the **733 clubs** that the UEFA has registered and with an invoicing estimation according to Deloitte of **14.600 MM€**, if we take the top "**10+1**", the **722 remaining clubs** earned: 14.600 MM€ – 2.764, 2MM€ = **11.835, 8 MM€**, that means **81%** of the total invoiced.

European 10(+1) clubs income: 2002/03 to 2007/08 (million €)

According to ranking of the study done by DELOITTE FOOTBALL MONEY LEAGUE in order to the classification by income of the 2007/08 season.



	MADRID	MAN.UD	BARÇA	BAYERN	CHELSEA	ARSENAL	LIVERPOOL	MILAN	AS ROMA	INTER	JUVE
Incomes 02/03	192,6	251,4	123,4	162,7	133,8	149,6	149,4	200,2	132	162,4	218,3
Incomes 03/04	236,0	259,0	169,2	166,3	217,0	173,6	139,5	222,3	109	166,5	215,0
Incomes 04/05	275,7	246,4	207,9	189,5	220,8	171,3	181,2	234	132	177,2	229,4
Incomes 05/06	292,2	242,6	259,1	204,7	221	192,4	176	238,7	127	206,6	251,2
Incomes 06/07	351	315,2	290,1	223,3	283	263,9	198,9	227,2	158	195	145,2
Incomes 07/08	365,8	324,8	308,8	295,3	268,9	264,4	210,9	209,5	175,4	172,9	167,5

Graph 1: Incomes Top 10 club evolution 2002/03 to 2007/08 season

The predominance of Real Madrid throughout the most recent seasons it seems absolutely consolidated in terms of incomes.

After the "white" club, the supplanted Manchester Utd and the Barça. Both are quite tight, especially when they have been the winners of the two last editions of Champions League. Therefore, Real Madrid will have to step on the accelerator if they want to be in the peak of European and world-wide soccer. Barça's trajectory, from 2003/04 up to today is worthy of admire.

The Bayern Munich shows all the Bavarian sobriety. During this past years, it has been climbing positions and it is situated in the fourth place of the income's classification. Another English club, the Chelsea, closes the head group in the fifth position. Therefore, the most representative clubs of the Premier League - Manchester United and Chelsea -, "Liga de las estrellas" - Real Madrid and FC Barcelona - and of the Bundesliga - Bayern de Munich - are the gold quintet of European soccer.

Arsenal and Liverpool show their soccer and economic muscles. Both clubs are two references we have to consider in the immediate future of European soccer. They are doing the things good and under the aegis of two great professionals: Arsene Wenger and Rafa Benítez. Is not by chance both have supplanted to the classic and great Italian clubs of the preeminent places.

And the list of Top 10 + 1 closes with the Italian clubs: Milan, Rome, Inter and Juve. The Juventus due to the *Moggigate* affair went down of category in Calcium League category, descending in the ranking when reducing its incomes in 06/07.

Consequently, Italian soccer must start up a reconversion plan due to stepping on the heels of Juventus it is already the Olympique Lyons and closely to them, the Schalke 04.

Meanwhile, in Spain no other club has the means of appearing in the list of Top 20, neither in Top 10 + 1, of European soccer. Spanish soccer, is in crisis, in a deep crisis, a reality, is intensely and simultaneously bitter, Real Madrid and FC Barcelona play another league that the other Spanish clubs, do not play due to whatever reasons that, they seem to see nor to value.

Summary of the most relevant characteristics of the top 10 +1 soccer clubs

If we synthesized the most outstanding outlines of each one of the 11 clubs we can affirm:

Real Madrid	We can see a noticeable growth in the incomes of 06/07 that in 07/08 stop growing exponentially. In order to continue being the unquestionable leader it will have to reinforce its income sources and promote the innovation.
Manchester United	Gives the impression that its glorious stage begins to come to its end. A revitalisation in its sales numbers in 06/07 occurs but in 07/08, in spite of gaining the Premier and the UEFA Champions League its invoicing seems to come to a standstill. Lack of great creativity in the number one of world-wide soccer?
FC Barcelona	Without any doubts has got the most methodical and consistent growth, along with the Real Madrid, with an unstoppable rising trend that will be reinforced as the result of the "triplet" of last season 2008/09.
Bayern Munich	Its new approach in the matter of stage operation, shows an important jump in 2007/08.
Chelsea	It seems as if the great moments of invoicing they lived in 2006/07 and that in the following season, even reaching Champions League final, the incomes seem weak.

	There is a lack of imagination and titles.
Arsenal	In spite of the stagnation of its incomes, its growth, of the hand of the Emirates Stadium, has been very singular. Is an important outsider of the Champions League due to its serious sports management, attention and economic financial management too.
Liverpool	Nowadays, it gives the impression that is to the limit of his capacities in accordance with his present status quo. For that reason movements in their shareholders can be positive push to him. The new stadium will suppose a determinant relaunching.
AC Milan	Alive reflection, as the rest of great Italian clubs, of an economic-soccer model in decline that has counted with the spectacular flow of income from TV but without reliable income by matchday. Italian soccer must re-invent itself.
AS Rome	Partly thanks to the reduction of the Juventus, Rome enters Top 10. The certain thing is that their income has increased to the point to surpass the Inter of Milan.
Inter Milan	Has come to less lately and with necessity of replacing itself. The loss of positioning forces the Inter, like the other Italian clubs, to review its economic model. The election of Mourinho as trainer prints another character to the Inter of Moratti.
Juventus	The case "Moggigate" condemned the club to the Second Division causing a drastic fall in its incomes. It must recover

In summary, Real Madrid, FC Barcelona and Bayern de Munich are the main clubs that show a greater potential of economic growth.

The "white" club with the new galactic investments wants to take another step to be the unquestionable king of European soccer. Madrid needs reinforce its economic power with European titles. Economic and soccer crossroads for the club preside by Florentine Perez and with certain urgencies: Saturday 22nd May 2010 the final of the League will take place in the Santiago Bernabéu Stage.

Barça shows a very progressive trend that can be accelerated due to the "triplet" of season 2008/09. Their incomes aims directly to overcome the barrier of the 400 million Euros. If they have to follow that trend, with successes at European level improving its curriculum, the Barça could be in the conditions of apllying to the economic leadership whenever their continuity is sustainable and nonintermittent. Manchester United seems to have exhausted its great grouth and leadership period. Perhaps, the club of Sir Alex Ferguson has touched its ceiling and it is necessary to re-invent its model to recover the unquestionable leadership that has had during so many years.

The Bayern Munich is a club guided by masterful and expert hands of those who were its big stars of international soccer, with the germanic sensibly in its economic model, showimg to know how to watch the opportunities of soccer

industry, taking the maximum advantage of their stadium. The Bavarian club needs to reinforce the European track records and dominate the Bundesliga. It has no shade in German soccer at the present time.

The Chelsea of Roman Abramovich has followed an excellent trajectory in the matter of incomes although in season 2007/08, the same as Manchester United, seems exhausted samples and seems to arrive at the limit of its possibilities as far as invoicing is concerned. Perhaps the Chelsea needs to seal its soccer strength with its dream: they have to win the Champion's League and assure the Premier League.

Although the Arsenal has stabilized the amount of incomes during the two last seasons, its projection must be emphasized and revalued more over if we think club "gunner" has not even won the UEFA Champions League.

The Liverpool is one of those clubs borned for the Europe Cup or UEFA Champions League, as it ratifies its extraordinary track records. The challenge continues being the Premier League. Its economic model, under the present conditions, seems to have no more development options although its potential soccer is enormous.

Really, the English clubs have a great potential in the matter of generation of incomes, with profit and loss accounts that can be improvable.

AC Milan, AS Rome, Inter and Juventus are the alive example of a soccer model that in economic terms offers clear signs of wearing down or obsolescence. The Italian clubs have not chosen the route of own stages, nor have considered until now the immense possibilities of increasing their income by matchday.

Possibly, the substantial alternative of the TV rights and his long ago great commercial capacity has dimmed a newer vision.

For that reason the 3 great ones - Milan, Juve and Inter - have entered in the descendent trend. Rome to change definetly needs European support.

To sum up, Italian soccer, must be re-invented in order to occupy the excellent positions that during the last seasons they have lost.

We can take a look to Barça and Madrid in the European soccer.

While Italian soccer is in backward movement in economic terms, losing its incomes in different operations, English soccer in which seems to have touched the economic ceiling with a model that approaches its limits.

Nevertheless, the development of Spanish soccer only happens through the potentialities that Real Madrid and FC Barcelona are able to start up, with a trend to the unquestionable growth."La liga de las estrellas" at the moment does not have no other main character making Real Madrid and Barça the center of economic power. The other Spanish clubs are not only at a colossal distance of Madrid and Barça but they are also far to accede, at the present time, to the economic ranking of the Top 20 whose barrier of entrance is placed in the ribbon of the 100 MM€ of annual invoicing.

The most representative clubs of the Premier League have between 7 and 8 places of the 20 the first and in some seasons Scottish soccer adds 10 of Top 20.

This lesson forces the Spanish clubs, besides of Madrid and Barça, to take a look on the soccer industry: they have to make a jump to an excellent sport management that contributes to have solid economic structures, or our clubs are economically condemned to dispute a second division League at European level, consequently end up disappearing.

If so, Spanish soccer will have loose the opportunity to abandon the stereotype of being a popular sport to become an active player of the incipient industry of soccer. In this 2009 time the future history of each of our dear clubs of soccer is being written. So: now or never. Maybe Spanish soccer is the reflection of our economy. It is possible that Spanish clubs do not know how to exploit in a better way the resources due to its autarkic management.

Until the other big clubs that conform "Liga de las estrellas" do not notice they have to reach a global positioning, with an international projection, betting hard for being references in Europe and leaving its provincial spirit and village soul, Spanish soccer will continue being thing of two clubs: Madrid and Barça. And the truth: it would be time to leave prejudices and taking like ship's log the trajectory and task of Real Madrid and FC Barcelona. They are two great organizations, emblematic and that each one has known to project itself to the entire world. Barça and Madrid plot the course to follow.

Several are the Spanish clubs that could reach an outstanding positioning in the European panorama. Valencia, Sevilla, Villarreal, Español, Deportivo de la Coruña, Mallorca, Zaragoza and, by all means, el Atlético de Madrid.

Perhaps, Villarreal and Sevilla have been most consequent thanks to their recent European experience. Valencia, Español, Deportivo, Mallorca and Zaragoza must find their way, be conscious of the enormous potential that hoard, putting it in game.

And even Athletic Club de Bilbao and CA Osasuna, with their genuine model of earth clubs, must watch much more towards Europe and with greater ambition.

Patrimonial, financial and economic situation analysis of top 10+1 european soccer clubs

We enter the nuclear marrow of the present work and that has the objective to show a vision of the economic and financial situation of the great European clubs of soccer in seasons 2006/07 and 2007/08.

For doing so, the balance and results accounts of the considered clubs are analyzed briefly as "Top 10" of the economic ranking in season 2007/08 and from which we have been talking in the preceding paragraphs. Real Madrid, Manchester United, FC Barcelona, Bayern de Munich, Chelsea, Arsenal, Liverpool, AC Milan, AS Rome, Inter of Milan and, closing the list that in fact would be the one of "Top 11" of European soccer, "vecchia signora", the Juventus of Turin, conform the elite of European soccer.

Possibly, in European soccer is spent more than it is earned. Perhaps, the soccer clubs get into debt over their possibilities, forcing indebtedness difficult to assume and which have a lack of sufficient net patrimonies. The excessive debt constitutes the main piece of our battle, along with overvalued assets and expenses very lifted for the levels of obtained incomes. Generally, it is said that we are in an economic crisis, the finances of the great European soccer confirm that sometimes the things do not work as they had to. Often, one concludes that the soccer clubs economy is the

alive reflection of the European economy. European soccer, the great European soccer, its in fact, involves a few great clubs: 10. Among them, they add every season the most appraised titles of European Leagues and, except for exceptions, among them also is the champion of the UEFA Champions League. Their incomes are very high in comparison with the other clubs that form the European soccer. They have high expenses, their assets are voluminous, their debts, often, also. The football matches are boradcasted for all Europe and big part of the world. Its commercial activity is overflowing, its innovations in sport marketing wake up possible business. Despite the previous thing, perhaps their numbers, their balance and their accounts of profit and loss aren't never penetrated and analysed. The financial statements of the big European soccer clubs come to be all a mystery. Through this study, like the tip of iceberg and brief introduction to much more deep analysis, is tried to take contact with the economy and the finances of the big European soccer, historical organizations, that as a whole accumulate Leagues and Cups of Europe, history and track records.

Balance at 30th june 2008

SUMMARIZED BALANCE "TOP 10+1" 2007/08 IN MM€

2007/08: SUMMARIZED BALANCE "TOP 10+1" CLUBS in MM€					
Nº	CLUB	TOTAL ASSETS	NOT EXECUTABLE DEBT	TOTAL DEBT	TOTAL LIABILITIES
		MM€	MM€	MM€	MM€
1	R. MADRID	739,2	176,4	562,8	739,2
2	MANCHESTER UTD	564,2	367,8	196,4	564,2
3	FC BARCELONA	455,8	18,0	437,8	455,8
4	BAYERN MUNICH	283,8	175,9	107,9	283,8
5	CHELSEA	383,0	-396,4	779,4	383
6	ARSENAL	1.053,9	201	852,9	1.053,9
7	LIVERPOOL	322,7	35,5	287,2	322,7
8	AC MILAN	325,6	-64,5	390,1	325,6
9	AS ROMA	281,9	128,9	153,0	281,9
10	INTER DE MILAN	368,2	-63,6	431,8	368,2
11	JUVENTUS TURIN	260,8	95,4	165,4	260,8
	TOTAL	5.039,1	674,4	4.364,7	5.039,1

EXCHANGE 30th JUNE 2008: 1 POUND = 1,2632 EUROS

Graph 2: Summarized Balance Top 10+1 Clubs, season 2007/08

The total assets of Top 10+1 add 5.039,1 million Euros. Nevertheless, those clubs, as it happens to the majority of European clubs, suffer from a defendant debt as it demonstrates that the handled total debt to 30th of June of 2008 come up to 4.364,7 million Euros and only 674,4 million Euros were equity. The problem of European soccer is the high debt.

The first club by assets is Arsenal. Its recent and great investment materialized in the Emirates Stadium is a reference of first order in volume of assets, and in debts since its liabilities are of 852,9 million Euros.

In London also, in Stamford Bridge, is the club with the highest debt: the Chelsea of Roman Abramovich, whose debt come up to 779.4 million Euros with the aggravating that their own resources are negative in 396,4 million Euros. The Chelsea is, therefore, in an evident state of bankruptcy that only the financing of other companies of the same group manages to avoid.

The Italian clubs and concretely both clubs of Milan, AC Milan and Inter, also offer a very bad perspective as far as own resources are concerned. Both are in technical situation of bankruptcy, with very similar sums of negative equity: around the 64 million Euros. Their debts, therefore, exceed their assets.

With a low capitalization is the FC Barcelona, just over 18 million Euros against assets of 455,8 million consequently their debt takes shape in 438 million Euros, and Liverpool of Rafa Benítez, with 35,5 million Euros and assets of 323 million being its debt higher than 287 million Euros.

Manchester United, a good reference in soccer and as an example of economic model throughout many years, although now its living internal turbulences, is positioned as the big club of European soccer in assets in the right proportion in which has own and external financiation.

Real Madrid, second club by volume of assets with 739 million Euros, reflects high own resources although are not enough to cope a debt of 563 million euros. As a result of the signings carried out during the summer of 2009 it seems to begin to go up.

Within coordinates of financial and also economic sensibly it appears Bayern Munich, club that is elevated as the maximum representative of German soccer, showing an excellent position between its own resources and its debt, with moderate predominance of first, and assets of 284 million Euros.

Possibly, one of the great surprises for any fan of soccer resides in the presence in the ranking of a big club such as Rome that even surpasses in incomes to the Internazionale of Milan. AS Rome has similar investments as Bayern Munich and a proportion between own resources and debt that without being excellent is not bad.

"Vecchia signora", the Juventus of Turin, closes the list of Top 10+1 with certain moderation in the assets, slightly superiors to the 260 million Euros, and its own financing something low but with a debt that is not presumably uncontrolled.

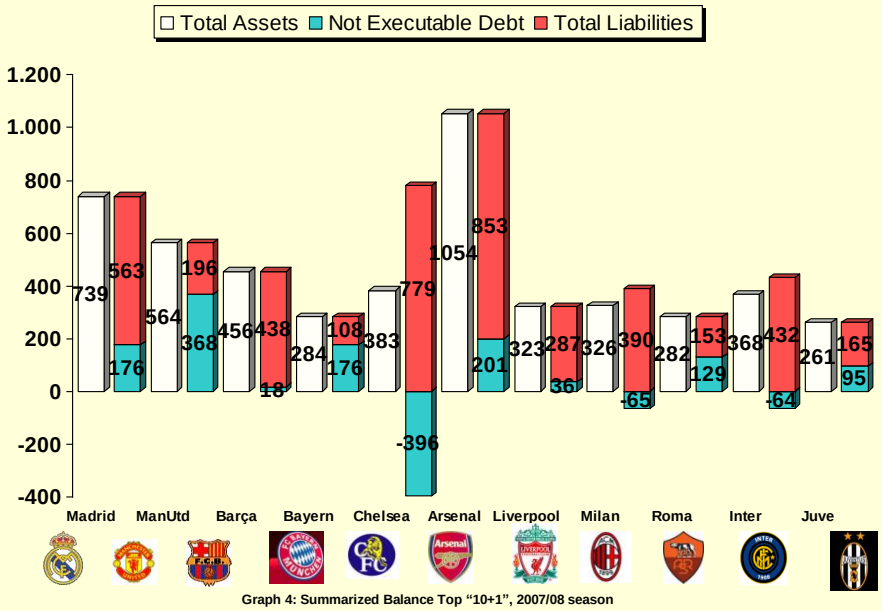
In the following picture the weight in percentage of each one of the great headings of the synthetic balance of the Top 10+1 clubs.

SUMMARIZED BALANCE "TOP 10+1" 2007/08 in MM€ and %

2007-2008	FIXED ASSETS		CURRENT ASSETS		TOTAL ASSETS		NET DEBT		LONG TERM DEBT		SHORT TERM DEBT		TOTAL LIABILITIES	
CLUB	MM€	%	MM€	%	MM€	%	MM€	%	MM€	%	MM€	%	MM€	%
R. MADRID	530,6	72	208,6	28	739,2	100	176,4	24	231,5	31	331,3	45	739,2	100
MANCHESTER UTD	337,9	60	226,3	40	564,2	100	367,8	65	113,7	20	82,7	15	564,2	100
FC BARCELONA	302,6	66	153,2	34	455,8	100	18,0	4	219,9	48	217,9	48	455,8	100
BAYERN MUNICH	231,9	82	51,9	18	283,8	100	175,9	62	18,5	7	89,4	31	283,8	100
CHELSEA	376,6	98	6,4	2	383,0	100	-396,4	-103	646,3	169	133,1	35	383,0	100
ARSENAL	638,7	61	415,2	39	1.053,9	100	201,0	19	430,7	41	422,2	41	1.053,9	100
LIVERPOOL	247,7	77	74,9	23	322,7	100	35,5	11	31,4	10	255,8	79	322,7	100
AC MILAN	145,3	45	180,3	55	325,6	100	-64,5	-20	3,2	1	386,9	119	325,6	100
AS ROMA	209,5	74	72,4	26	281,9	100	128,9	46	35,2	12	117,8	42	281,9	100
INTER DE MILAN	175,1	48	193,1	52	368,2	100	-63,6	-17	14,5	4	417,3	113	368,2	100
JUVENTUS TURIN	175,6	67	85,2	33	260,8	100	95,4	37	88,9	34	76,5	29	260,8	100
TOTALS	3.371,6	67	1.667,5	33	5.039,1	100	674,4	13	1.833,8	36	2.530,9	50	5.039,1	100

Graph 6: Summarized Balance Top 10+1 clubs in %, 2007/08

Balance 2007/08 "Top 10+1" (in million €)



Graph 4: Summarized Balance Top "10+1", 2007/08 season

All this, in a graphical way, can be expressed of this form: In the preceding graph the relation between investments of the clubs Top 10+1 and its financing is showned.

Thus, in Real Madrid is seen the importance of the 563 million Euros to cover great part with the 739 million assets, whereas the 176 million equity occupy a secondary place. Exactly, the opposite situation is appraised in the Manchester United that with more moderate assets than those of Real Madrid, in 564 million Euros, fundamentally finances its investments by the route of the equity, with 368 million, relegating the debt to secondary with 196 million.

The patrimonial position and, mainly, financial of FC Barcelona does not stop surprising. Their assets of 456 million Euros are very set out to the weight of the debt that takes shape in 438 million and only 18 million are the amount of equity available at 30 of June of 2008. The hard years in sport erratic the economy of beginnings of the present decade, are chasing Barça; perhaps, it would have to act with a greater rigor in economic management.

Very provided Bayern Munich as much in assets as in the handling of the financing sources, with that predominance before explained of the capitalization over the indispensable liabilities and, after German soccer, we entered in the other three faces of English soccer: Chelsea, Arsenal and Liverpool, three worthy representatives of the soccer power of the great British soccer.

High investments done by the Chelsea, whose last sport results of these last seasons, are approaching it to privileged places to which it aspires, handling an investment of 383 million Euros but with tremendous handicap of the negative own bottoms that throw a spectacular deficit of 396 million, resolved through a debt of spread with 779 million Euros.

Arsenal's job is explained more by its firm bet in the Emirates Stadium and although at first their numbers can seem of a great complexity. It seems that the business plan of the club managed in the sport area by Arsene Wenger is the alive reflection of a good task that later or early, will gather its fruits. Liverpool, of the hand of Rafa Benítez, seems to struggle in crossroads. To give the jump or not to give it? Again, the conjectures in the surroundings of the Liverpool, are here delicated.

The true is that Liverpool, within the big ones, at the present time, does not finish taking off and the patrimonial levels in which works need a push to consolidate it within great English soccer.

If arrived at this point, look which is the assets panorama, in its two big blocks, and of the liabilities as far as financial resources, to the past 30th June 2008, we can make a better idea about the quality of the assets and liabilities.

SUMMARIZED BALANCE "TOP 10+1" 2007/08 in MM€

SEASON 2007-2008: SUMMARIZED BALANCE "TOP 10+1" EUROPEAN SOCCER CLUBS							
2007/08	FIXED ASSETS	CURRENT ASSETS	TOTAL ASSETS	NOT EXECUTABLE DEBT	LONG TERM DEBT	SHORT TERM DEBT	TOTAL LIABILITIES
CLUB	MM€	MM€	MM€	MM€	MM€	MM€	MM€
R. MADRID	530,6	208,6	739,2	176,4	231,5	331,3	739,2
MANCHESTER UTD	337,9	226,3	564,2	367,8	113,7	82,7	564,2
FC BARCELONA	302,6	153,2	455,8	18,0	219,9	217,9	455,8
BAYERN MUNICH	231,9	51,9	283,8	175,9	18,5	89,4	283,8
CHELSEA	376,6	6,4	383,0	-396,4	646,3	133,1	383,0
ARSENAL	638,7	415,2	1.053,9	201,0	430,7	422,2	1.053,9
LIVERPOOL	247,7	74,9	322,7	35,5	31,4	255,8	322,7
AC MILAN	145,3	180,3	325,6	-64,5	3,2	386,9	325,6
AS ROMA	209,5	72,4	281,9	128,9	35,2	117,8	281,9
INTER DE MILAN	175,1	193,1	368,2	-63,6	14,5	417,3	368,2
JUVENTUS TURIN	175,6	85,2	260,8	95,4	88,9	76,5	260,8
TOTALS	3.371,6	1.667,5	5.039,1	674,4	1.833,8	2.530,9	5.039,1

Graph 5: Summarized Balance Top 10+1 clubs, 2007/08

In the soccer world, clubs of a certain level must coexist with an inevitable stamp that crystallize in investments in fixed assets, material and intangible, due to interests in other companies and other accessory investments, they concentrate financial investments.

However, in any case the experience indicates that the fixed assets, when grouping the investments in material immobilizations - stage, pavilions, sport cities, fields of training, gymnasiums, facilities, buildings… -, these suppose the thickness of the investment that cohabits with another big typical investment of the soccer clubs: the intangible assets, in which the signings of the players stand out. For the Top 10+1, total fixed assets at 30th June 2008 took shape in 3.371, 6 million Euros.

To a lesser extent, then, they show the current assets, where the indebted ones in the short term, as a rule, are the big members. Some clubs, however, deserve a special study when constituting the balances of current assets a sum superior to the one of the fixed or noncurrent assets. This detail occurs in AC Milan and Inter of Milan. In any case, the 11 big European clubs showed at 30th June 2008 total current assets of 1.667, 5 million Euros.

And in the opposite side appears Chelsea that counts on the thickness of its investment is materialized in noncurrent or fixed assets and there is little or no place for the current assets which are testimonial.

If the assets of the soccer clubs offer therefore a clear inclination towards the fixed assets or permanent investments, in front of the current assets, in financial aspects the things transform due to the financial structure of Top 10+1 appears weak in equity or nonindispensable liabilities, with 674,4 million Euros, high long term debt with 1.834 million Euros but, as it ends, the important thing is the short term debt with a balance at 30th June 2008 corresponding to Top 10+1 of 2.530, 9 million Euros.

In the following graph we can observe the percentage participation of each one of the important headings of the assets and liabilities of Top 10+1. Whereas in the assets the patrimonial logic prevails, with fixed assets that represent 67% of the investment and a current assets that supposes 33%, with exceptional cases within the list of Top 10+1 like Chelsea or, as more above it scored, AC Milan and Inter of Milan, where the current assets exceed to the noncurrent assets; however, in the concert of the liabilities, of the financing sources some decompensations are noticed.

SUMMARIZED BALANCE "TOP 10+1" 2007/08 in MM€ and %

2007-2008	FIXED ASSETS		CURRENT ASSETS		TOTAL ASSETS		NET DEBT		LONG TERM DEBT		SHORT TERM DEBT		TOTAL LIABILITIES	
CLUB	MM€	%	MM€	%	MM€	%	MM€	%	MM€	%	MM€	%	MM€	%
R. MADRID	530,6	72	208,6	28	739,2	100	176,4	24	231,5	31	331,3	45	739,2	100
MANCHESTER UTD	337,9	60	226,3	40	564,2	100	367,8	65	113,7	20	82,7	15	564,2	100
FC BARCELONA	302,6	66	153,2	34	455,8	100	18,0	4	219,9	48	217,9	48	455,8	100
BAYERN MUNICH	231,9	82	51,9	18	283,8	100	175,9	62	18,5	7	89,4	31	283,8	100
CHELSEA	376,6	98	6,4	2	383,0	100	-396,4	-103	646,3	169	133,1	35	383,0	100
ARSENAL	638,7	61	415,2	39	1.053,9	100	201,0	19	430,7	41	422,2	41	1.053,9	100
LIVERPOOL	247,7	77	74,9	23	322,7	100	35,5	11	31,4	10	255,8	79	322,7	100
AC MILAN	145,3	45	180,3	55	325,6	100	-64,5	-20	3,2	1	386,9	119	325,6	100
AS ROMA	209,5	74	72,4	26	281,9	100	128,9	46	35,2	12	117,8	42	281,9	100
INTER DE MILAN	175,1	48	193,1	52	368,2	100	-63,6	-17	14,5	4	417,3	113	368,2	100
JUVENTUS TURIN	175,6	67	85,2	33	260,8	100	95,4	37	88,9	34	76,5	29	260,8	100
TOTALS	3.371,6	67	1.667,5	33	5.039,1	100	674,4	13	1.833,8	36	2.530,9	50	5.039,1	100

Graph 6: Summarized Balance Top 10+1 clubs in %, 2007/08

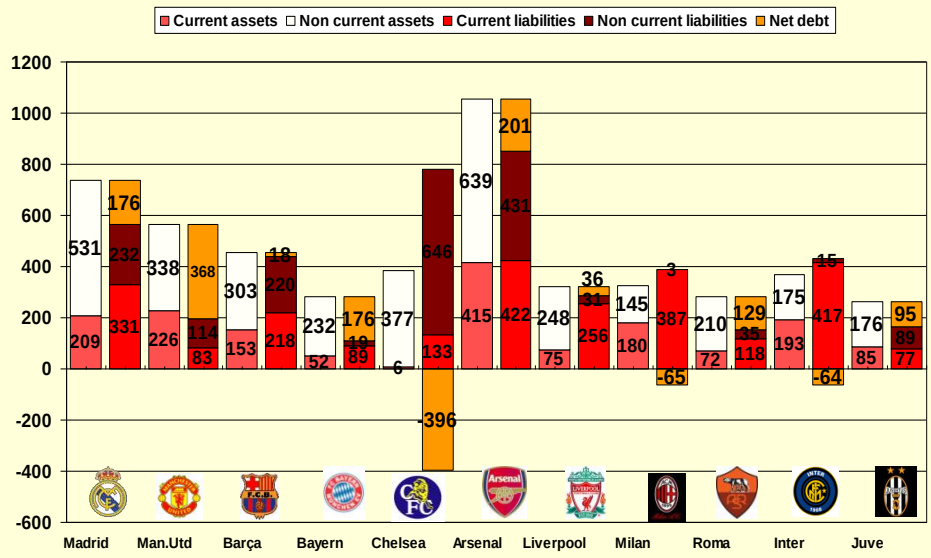
The low level of capitalization of the Top 10+1 that comes to corroborate the situation in which at present time is Spanish "Liga de las Estrellas" and the English Premier League, with few clubs properly capitalized and the great majority excessively indebted. The question around that low capitalization must raise in these terms: clubs really start with a lacking defendant of equity or perhaps it is that as a result of the losses that season after season are accumulated, the own resources narrow in a so alarming way?

The long term debt of the clubs of Top 10+1 goes up to around the 1,834 million Euros but the weight of the short term debt, in which all the commitments take shelter of payment to eliminate in the maximum term of a year, exceeds 2.530 million Euros. How will be able to be eliminated those 2.530 million Euros if they have 1.667,5 million of current assets? Through the resources that generate the profit and loss? A good number of them, close its annual year with deficit.

In bankruptcy situation, technically speaking, are Chelsea with 396.4 million Euros of negative equity, AC Milan with 64.5 million and Inter of Milan with 63.6 million.

In this graph, the relation in each club between its assets and liabilities is stated, this marks the financial edges of Top 10+1.

Balances resumidos "Top 10+1": representación gráfica 2007/08



Graph 7: Summarized Balance Top 10+1 clubs, 2007/08

Balance at 30th june 2007

SUMMARIZED BALANCE "TOP 10+1" 2006/07 in MM€

2006/07: SUMMARIZED BALANCE DE LOS CLUBES "TOP 10+1"				
CLUB	TOTAL ASSETS	NOT EXECUTABLE DEBT	TOTAL DEBT	TOTAL LIABILITIES
	MM€	MM€	MM€	MM€
R. MADRID	668,2	141,1	527,1	668,2
MANCHESTER UTD	591,7	364,4	227,3	591,7
FC BARCELONA	397,3	8,5	388,8	397,3
BAYERN MUNICH	243,4	176,6	66,8	243,4
CHELSEA	385,2	-361,6	746,8	385,2
ARSENAL	1.086,4	198,2	888,2	1.086,4
LIVERPOOL	250,6	29,3	221,3	250,6
AC MILAN	303,6	-47,5	351,1	303,6
AS ROMA	252,1	110,3	141,8	252,1
INTER DE MILAN	389,1	-70,2	459,3	389,1
JUVENTUS TURIN	259,4	116,3	143,1	259,4
TOTALES	4.827,0	665,4	4.161,6	4.827,0

Exvhange 2007: 1 POUND = 1,4856 EUROS

Graph 8: Summarized Balance Top 10+1 clubs, 2006/07

If the assets of Top 10+1 were in 30th June 2007 of 4.827 million Euros and at 30th June from 2008 of 5.039, 1 million, the patrimonial increase, as far assets are concerned, has been of 212,1 million, which in percentage is equivalent to 4.39%.

In any case, already in 2006/07 the trend of low capitalization occurred in the context of Top 10+1, with 665,4 million representative Euros a 14% of the set of the financial resources and with a total debt over 4.161 million, 86% of the liabilities.

In season 2006/07 Arsenal already headed the list of the assets with more than 1.086 million Euros, almost 200 million equity and a high debt near to 900 million Euros.

Also, then it was the other London club, the Chelsea, that occupied the second position as far as debt with 747 million Euros but with the terrible handicap to be in technical situation of bankruptcy.

Manchester United, with almost 592 million Euros of assets that financed through 364,4 million equity and debt in quantity of 227,3 million, was the jewel of the soccer crown in economic matter.

The modest Liverpool with its investments based in 250,6 million Euros, showed a exhibition enough it jeopardize to the indebtedness with 221,3 million and one low capitalization by 29,3 million.

While Real Madrid, with more than 662 million Euros of assets, had own bottoms in 141,1 million and indispensable liabilities of 527,1 million, the FC Barcelona, whose assets exceeded 397 million as soon as it counted on own capitalization: only 8,5 million, having to trust the financing of its assets to the resource of the debt that was placed in 389 million.

The Bayern de Munich, doing Gallic of its good task, counted with 243 million Euros of assets that financed through 176,6 million net patrimony and only 66,8 million total debt.

And the review to the balance to 30 of June of 2007 concludes contemplating the panoramic one of the Italian soccer, in which AC Milan and Inter of Milan present/display both negative own bottoms by 47,5 and 70,2 million Euros, respectively, which means that they must more than they have. Indeed, the debts of Milan added 351,1 million against assets of 303,6 million, whereas those of the Inter they surpassed 459 million versus assets of 389,1 million Euros.

Luckily, AS Rome, with 252,1 million Euros of assets supported thanks to own bottoms in quantity of 110,3 million and through debt in 141,8 million, and Juventus with 259,4 million assets covered with 116,3 million net patrimony and 143,1 million debt, closes the block of the Italian soccer that seems to be in low hours.

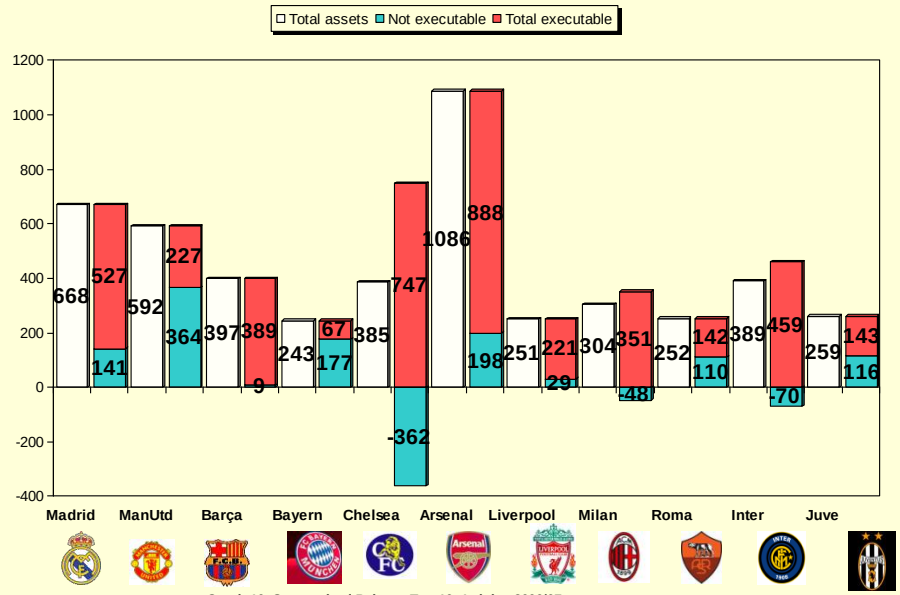
The percentage measures of the synthetic balance of the clubs Top 10+1 of European soccer appear in the following graph.

SUMMARIZED BALANCE "TOP 10+1" 2006/07 in MM€ and %

CLUB	TOTAL ASSETS		NOT EXECUTBALE		TOTAL DEBT		TOTAL LIABILITIES	
2006/2007	MM€	%	MM€	%	MM€	%	MM€	%
R. MADRID	668,2	100%	141,1	21%	527,1	79%	668,2	100%
MANCHESTER UTD	591,7	100%	364,4	62%	227,3	38%	591,7	100%
FC BARCELONA	397,3	100%	8,5	2%	388,8	98%	397,3	100%
BAYERN MUNICH	243,4	100%	176,6	73%	66,8	27%	243,4	100%
CHELSEA	385,2	100%	-361,6	-94%	746,8	194%	385,2	100%
ARSENAL	1.086,4	100%	198,2	18%	888,2	82%	1.086,4	100%
LIVERPOOL	250,6	100%	29,3	12%	221,3	88%	250,6	100%
AC MILAN	303,6	100%	-47,5	-16%	351,1	116%	303,6	100%
AS ROMA	252,1	100%	110,3	44%	141,8	56%	252,1	100%
INTER DE MILAN	389,1	100%	-70,2	-18%	459,3	118%	389,1	100%
JUVENTUS TURIN	259,4	100%	116,3	45%	143,1	55%	259,4	100%
TOTALS	4.827,0	100%	665,4	14%	4.161,6	86%	4.827,0	100%

Graph 9: Summrized Balance Top 10+1 clubs in %, 2006/07

Balance 2006/07 "Top 10+1" (in million €)



Graph 10: Summarized Balance Top 10+1 clubs, 2006/07

SUMMARIZED BALANCE "TOP 10+1" SEASON 2006/07 in MM€

SEASON 2006-2007: SUMMARIZED BALANCE "TOP 10+1" EUROPEAN SOCCER CLUB							
2006-2007	FIXED ASSETS	CURRENT ASSETS	TOTAL ASSETS	NET DEBT	STD	LTD	TOTAL LIABILITIES
CLUB	MM€	MM€	MM€	MM€	MM€	MM€	MM€
R. MADRID	477,3	190,9	668,2	141,1	246,6	280,5	668,2
MANCHESTER UTD	420,4	171,3	591,7	364,4	134,0	93,3	591,7
FC BARCELONA	297,2	100,1	397,3	8,5	200,9	187,9	397,3
BAYERN MUNICH	135,3	113,1	243,4	176,6	22,1	44,7	243,4
CHELSEA	379,3	5,9	385,2	-361,6	631,1	115,7	385,2
ARSENAL	772,6	313,8	1.086,4	198,2	665,4	222,8	1.086,4
LIVERPOOL	195,6	54,9	250,6	29,3	31,0	190,3	250,6
AC MILAN	153,9	149,7	303,6	-47,5	3,7	347,4	303,6
AS ROMA	187,5	64,6	252,1	110,3	21,9	119,9	252,1
INTER DE MILAN	172,5	216,6	389,1	-70,2	10,5	448,8	389,1
JUVENTUS TURIN	148,2	111,2	259,4	116,3	70,0	73,1	259,4
TOTALS	3.339,8	1.492,2	4.827,0	665,4	2.037,2	2.124,4	4.827,0

Graph 11: Summarized Balance Top 10+1 clubs, 2006/07

Superiority of noncurrent assets over current assets, in the limit case of Chelsea, and the peculiar exception of the Inter of Milan, as something normal at the time of outlining the investing characteristics of the clubs.

Already mentioned low capitalization of the clubs, except for exceptions like those of Manchester United, Bayern de Munich and, to a lesser extent, Real Madrid, AS Rome and Juventus, it causes a very exaggerated dependency of the indebtedness that in season 2006/07 was distributed almost to equal parts between long term debt, with 2.037, 2 million Euros, and short term debt, with 2.124, 4 million.

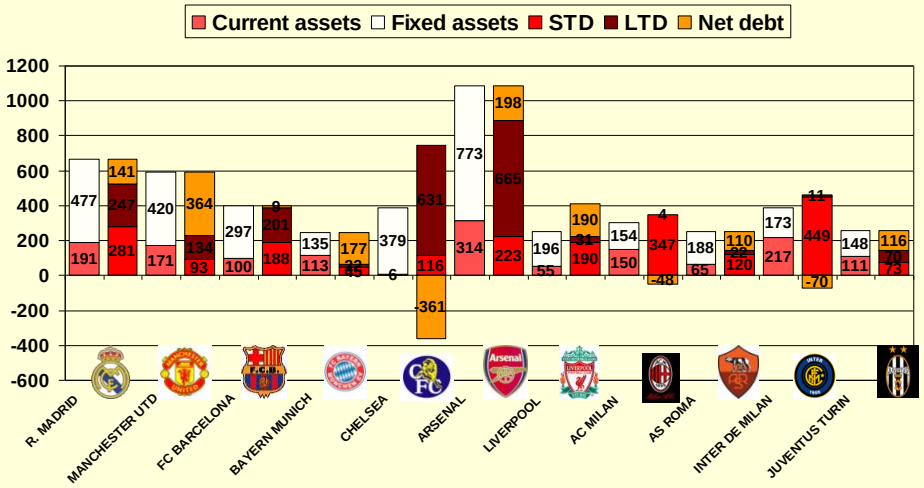
The bigger part of the clubs was in a seriously financial situation: their short term debts surpassed the working capital and in certain cases, causing the existence of negative funds of maneuver. Nevertheless, certain clubs behaved acceptably with respect to the financial balance in the short term, so that their current assets were majors that its debts in the short term. Manchester United, Bayern de Munich, Arsenal and Juventus show that the finances can also be well managed in the complex world of European soccer.

SUMMARIZED BALANCE "TOP 10+1" SEASON 2006/07 in MM€

2007-2008	FIXED ASSETS		CURRENT ASSETS		TOTAL ASSETS		NET DEBT		LTD		STD		TOTAL LIABILITIES	
CLUB	MM€	%	MM€	%	MM€	%	MM€	%	MM€	%	MM€	%	MM€	%
R. MADRID	477,3	71	190,9	29	668,2	100	141,1	21	246,6	37	280,5	42	668,2	100
MANCHESTER UTD	420,4	71	171,3	29	591,7	100	364,4	62	134,0	23	93,3	16	591,7	100
FC BARCELONA	297,2	75	100,1	25	397,3	100	8,5	2	200,9	51	187,9	47	397,3	100
BAYERN MUNICH	135,3	56	113,1	46	243,4	100	176,6	73	22,1	9	44,7	18	243,4	100
CHELSEA	379,3	98	5,9	2	385,2	100	-361,6	-94	631,1	164	115,7	30	385,2	100
ARSENAL	772,6	71	313,8	29	1.086,4	100	198,2	18	665,4	61	222,8	21	1.086,4	100
LIVERPOOL	195,6	78	54,9	22	250,6	100	29,3	12	31,0	12	190,3	76	250,6	100
AC MILAN	153,9	51	149,7	49	303,6	100	-47,5	-16	3,7	1	347,4	114	303,6	100
AS ROMA	187,5	74	64,6	26	252,1	100	110,3	44	21,9	9	119,9	48	252,1	100
INTER DE MILAN	172,5	44	216,6	56	389,1	100	-70,2	-18	10,5	3	448,8	115	389,1	100
JUVENTUS	148,2	57	111,2	43	259,4	100	116,3	45	70,0	27	73,1	28	259,4	100
TOTALS	3.339,8	69	1.492,1	31	4.827,0	100	665,4	14	2.037,2	42	2.124,4	44	4.827,0	100

Graph 12: Summarized Balance Top 10+1 clubs, 2006/07

Summarized Balance "Top 10+1" 2006/07



Graph 13: Summarized balance Top 10+1 clubs, 2006/07

Accounts of results 2006/07 and 2007/08

The economic profile of the great clubs is caused by the examination of its profit and loss. Frequently, the phase angles and decompensations that are noticed in the balance have their origin in an economic management that is not correctly done. Generally, soccer is generous with the expenses and within these, those of personnel, repayments to sport and nonsport group, along with high general expenses and important amounts that are payed for external services, decrease the already weak profit and loss.

If those impacts are feet with great virulence in the bigger part of soccer clubs of the great national Leagues, nevertheless it seems as if Top 10+1, by their great dimension, their ample projection, their relative facility to catch and to obtain resources, is somewhat safe from those economic swings that undergo so many clubs.

"TOP 10+1" EUROPEAN SOCCER CLUBS. PROFIT & LOSS 2007/08 IN MILLIONS €

2007-2008	MADRID	MAN.UTD	BARÇA	BAYERN	CHELSEA	ARSENAL	LIVERP.	MILAN	ROMA	INTER	JUVE
CONCEPT	MM€	MM€	MM€	MM€	MM€	MM€	MM€	MM€	MM€	MM€	MM€
IINCOMES	366	323	309	287	240	282	202	238	170	203	204
OPERATING CHARGES	352	269	293	280	327	248	205	311	167	342	214
PROFIT BEFORE TAXES	14	54	16	7	-87	34	-3	-73	3	-139	-10
NET INTEREST	-2	1	-8	-3	-1	-21	-11	-8	11	-3	1
ORDINARY PROFIT	12	55	8	4	-88	13	-14	-81	14	-142	-9
EXTRAORDINARY PROFIT	39	29	0,5	-	-	34	27	-	15	-4	-
EBITDA	51	84	8,5	4	-88	47	13	-81	29	-146	-9
TAXES	-16	-25	1.5	-2	0	-14	-3	+14	-11	-2	-11
EBIT	35	59	10	2	-88	33	10	-67	18	-148	-20

Graph 4: Profit & Loss Top 10+1 clubs, 2007/08

Exchange 30TH JUNE 2008: 1 POUNDS = 1,2632 EUROS

If we look at profit and loss results summarized corresponding to season 2007/08, only Real Madrid with 14 million of Euros, Manchester United with 54, Barça with 16 million, Bayern with 7, Arsenal with 34 million, and AS Rome with 3 million, achieved to close their profit and loss respective, that are the ones that show the way towards the right economic vaccine, with surplus.

The remaining clubs, like Chelsea that lost 87 million euros, the Liverpool with a deficit of 3 million euros, Milan with 73 million euros loss, the Inter with 139 million euros negative results and the Juventus with 10 million euros in red numbers, lived the hard blow in which their operating expenseses exceeded their incomes.

The big part of the clubs, as a result of their debts, face another painful challenge: to fit the blow of the financial results that generally are settled with negative numbers. Except for Manchester United, Rome and Juventus, all the other clubs Top 10+1 underwent that negative impact.

That way, the result coming from the ordinary activities of the clubs adjusts. The Manchester United can presume of its economic position when obtaining ordinary results of 55 million Euros that soon are increased in 29 million euros by extraordinary results to end up throwing a benefit before taxes of 84 million Euros.

Real Madrid with an ordinary benefit of 12 million euros increased after with atypical capital gains by 39 million euros, closes the season with a benefit before taxes of 51 million Euros.

On the other hand, the FC Barcelona, that sees decreased its result of operation by the 8 million euros negative financial results, and without hardly influence of extraordinary gains generates a benefit before taxes of 8.5 million. By a similar way seemed the Bayern de Munich is lined up whose benefit before taxes takes shape in 4 million Euros.

As it has been said, Chelsea shows the acute picture of losses of English soccer, with 88 million Euros. However, the Chelsea is not the club that loses more since the Inter of Milan throws a deficit before taxes of 146 million Euros and their neighbor and citizen rival, Milan, of 81 million euros.

Good behavior of Arsenal, although the financial results reduce their surplus of operation, that combining with the excess profits stands before a gain before taxes of 47 million Euros. And good the Liverpool, whose account of operation she is very right, remaking the ordinary loss of 14 million Euros by means of extraordinary results, something that allow him to obtain a benefit before taxes of 13 million euros.

AS Rome, playing with a surplus of operation increased soon with positive financial results and finished off with extraordinary gains, reaps 29 million euros benefit before taxes. Finally, the Juventus closes the season with a loss before taxes of 9 million Euros that, in the end, increases until 20 million euros.

"TOP 10+1" EUROPEAN SOCCER CLUBS. PROFIT & LOSS 2006/07

2006-2007	MADRID	MAN.UTD	BARÇA	BAYERN	CHELSEA	ARSENAL	LIVERP.	MILAN	ROMA	INTER	JUVE
CONCEPT	MM€	MM€	MM€	MM€	MM€	MM€	MM€	MM€	MM€	MM€	MM€
INCOMES	351	312	290	226	245	297	199	275	148	221	187
OPERATING CHARGES	323	241	271	201	358	263	217	287	137	409	181
PROFIT BEFORE TAXES	28	71	19	25	-113	34	-18	-12	11	-188	6
NET INTEREST	-2	-	-6	4	-	-22	-4	-8	-1	-9	-2
ORDINARY PROFIT	26	71	13	29	-113	12	-22	-20	10	-197	4
EXTRAORDINARY PROFIT	18	18	-4	-	13	-4	-9	-2	5	-7	-
EBITDA	44	89	9	29	-100	8	-31	-22	15	-204	4
TAXES	-9	-25	-2	-10	0	-3	+1	-10	-5	-3	-5
EBIT	35	64	7	19	-100	5	-30	-32	10	-207	-1

Graph 15: Profit & Loss Top 10+1 Clubs, 2006/07

Exchange 30TH JUNE 2007: 1 POUND = 1,4856 EUROS

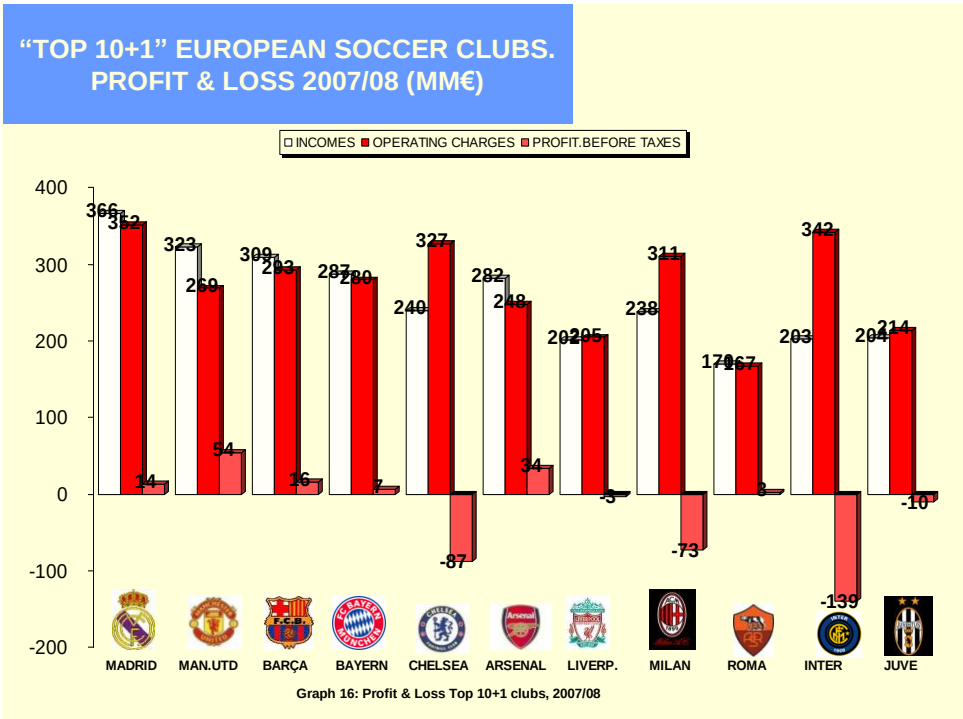
At the end of the season 2006/07, Madrid, Manchester united, Barça, and Bayern conformed a first winners group in the matter of operation result to surplus, respectively, of 28, 71, 19 and 25 million euros.

The Chelsea was loosing 113 million Euros, Arsenal was saved with a benefit of operation of 34 million euros, whereas Liverpool lost 18 million euros, Milan 12 million euros and the Inter the chilling sum of 188 million euros. AS Rome with 11 million euros benefit and Juventus with 6 million euros, squared their accounts of operation.

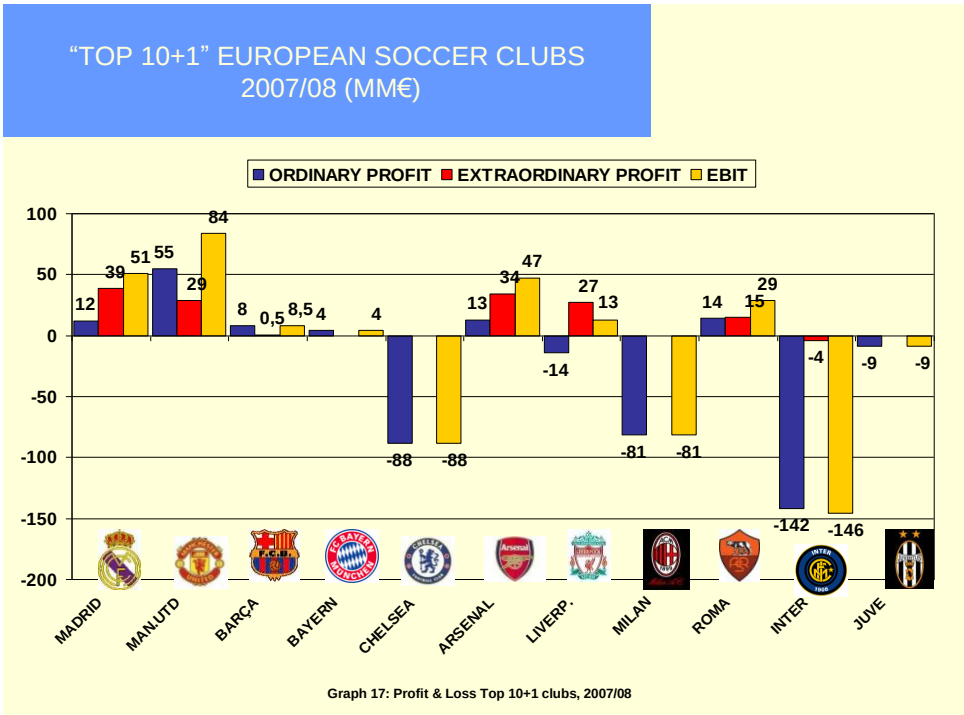
The ordinary results behaved in a negative way in the cases of Chelsea, Liverpool, Milan and Inter of Milan, arriving in this one until the 197 million loss Euros.

To summarize, it can be affirmed that within the clubs Top 10+1 exist different models of economic management. Very correctly Manchester United, Bayern de Munich and Arsenal. Taking advantage of its great economic capacity and its mediatic energy, Real Madrid and Barcelona. In favour of the economic balance, Liverpool and AS Rome, along with Juventus. And standing while their financial contributors can and want, are Chelsea, AC Milan and Internazionale of Milan.

In the following graphs it is tried to show in an of expressive way the culminating aspects of the profit and loss results that have appeared.

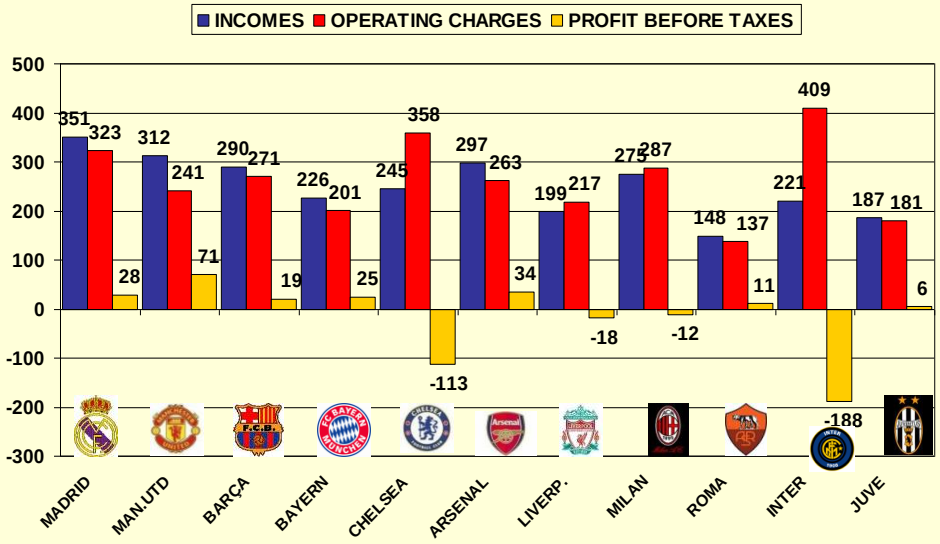


Graph 16: Profit & Loss Top 10+1 clubs, 2007/08



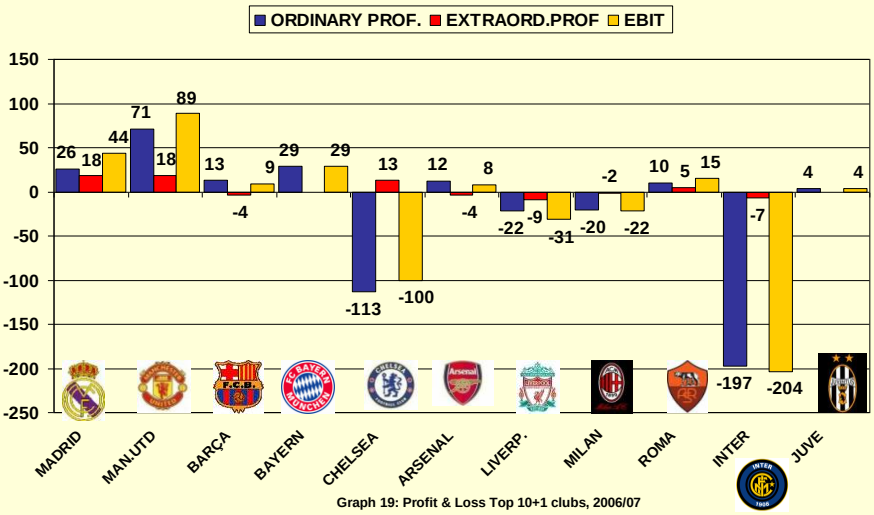
Graph 17: Profit & Loss Top 10+1 clubs, 2007/08

"TOP 10+1" EUROPEAN SOCCER CLUBS 2006/07



Graph 18: Profit & Loss Top 10+1 clubs, 2006/07

"TOP 10+1" EUROPEAN SOCCER CLUBS. 2006/07(MM€)



Graph 19: Profit & Loss Top 10+1 clubs, 2006/07

Possibly, during the presentation of the Communication there will be opportunity to offer other economico-financial sparkles on the patrimonial, financial and economic situation of those big clubs that conform the elite of European soccer: the Top 10+1, referring, leaders and, in any case, models which to work on and to learn.