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Abstract

This paper investigates the impact of hooliganism on attendance in Italian stadium and the effect of anti-violence measures adopted by Italian Government in 2007. Results first show that a structural break took place on Serie A average attendance in season 1979/80. The econometric investigation focused on the average of tickets sold per game as dependent variable. We have found a robust negative impact of hooliganism and match-fixing scandals on stadium attendance. In the light of the previous results we focus on recent policy measures adopted by Italian authorities aiming at reducing hooliganism. These measures, grounded on a 'fidelity card', were designed to keep out the extreme and violent part of committed fans in favour of the un-committed. According to our econometric investigation involving single match played in Serie A from season 2007/08 to 2011/12 the substitution effect failed and the 'fidelity card' strategy did not turn to be successful if considering the average attendance point of view.

JEL codes: D12, K42, L83.
Keywords: Hooliganism, Stadium attendance, Italian Serie A

Introduction

Football is very important in social and economic life in Italy. Considering *Serie A,* the top Italian Football League, in terms of number of fans, of active footballers, of audience and cumulative revenues, Italian football seems to be healthy.[1] However, if we take into consideration the stadium attendance, anopposite scenario appears to be true. In season 2011/12, *Bundesliga* doubled *Serie A* average attendance, which was less than 2/3 of *Premiere League* and 4/5 of Spanish *Liga*. Moreover, considering the percentage of stadium occupation, the negative trend is confirmed. In season 2011/12, among European top leagues, *Serie A* presents the worst performance with a percentage of occupation of about 53%, which is significantly lower than French *League 1* (67%), *Liga* (73%), *Premiere League* (91%) and *Bundesliga* (93%).[2]

In sum, Italian *Serie A* exhibits serious difficulties in attracting supporters in stadiums. This is not a recent phenomenon. As pointed out by Di Domizio (2007), this negative trend in stadium attendance took shape in the early 80s. Several factors may have contributed to this phenomenon: structural inadequacy of old stadiums; competing TV coverage; loss of credibility because of match-fixing and betting scandals[3]. In addition, football is often perceived to be associated with a violent and risky environment because of hooliganism.

Our paper focuses on the last issue. In particular, we study the relationship between stadium attendance, hooliganism and related counter strategies. We first present a long run perspective; we show that the negative trend inattendance took shape at the end of 70's when hooliganism emerged. Secondly, we pursue a short run perspective in order to analyse the impact of public coping policies. This

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[1] On Italian organization of professional football see Baroncelli and Caruso (2011) and Report Calcio 2012 published by FederazioneItalianaGiuocoCalcio (FIGC) available on www.figc.it (June 2012).
[2] For data on stadium attendance see of www.trasfermrkt.de in the section *archive* (August 2012).
[3] On economics of match-fixing see Caruso (2009).

investigation covers the period from season 2007/08 to 2011/12. Season 2007/08 was the first in which the Ministry of internal affairs implemented some emergency measures under the Decree n.8 of 8th February 2007. The emergency measures were influenced by the public opinion after the death of the police officer FilippoRaciti (2nd February 2007) during clashes before the derby between Catania and Palermo. In summary, we investigate the impact of this recent policy on stadium attendance.

The paper is structured as follows: in the next section we present a long-run analysis of stadium attendance in Italy. Section two includes a brief overview on Italian strategies against soccer violence in the last two decades. Section three describes the variables used in the empirical investigation performed on attendance at single match level. Section four discusses the results and section five concludes the paper.

1. *Italian stadium attendance: a long period analysis*

Stadium attendance in Italy is low if compared to the relevance that football has in the Italian socio-economic context. As mentioned above, the numbers relating to Italian football's economic performance, social importance and active participation are impressive. Almost 1,4 millions of active footballers are engaged in about 600,000 official matches. Between the age 8-12 years, one boy out of four plays football in a club affiliated to the Italian football's Federation (FGCI). The added value of the Italian professional football system is about 2,500 mln/€ of which more than 80% is produced by *Serie A*. The aggregate value of the professional football in Italy is about 14% of the European aggregate production.[4] Moreover, the economic value of football has increased exponentially since the early 90s when private media corporation started to broadcast football matches for the first time ever.

The positive economic performance, however, does not appear to be twinned with 'good practices' in management of teams, organization

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[4] Data refer to 2010. Source: Report Calcio 2012, FIGC, available on www.figc.it.
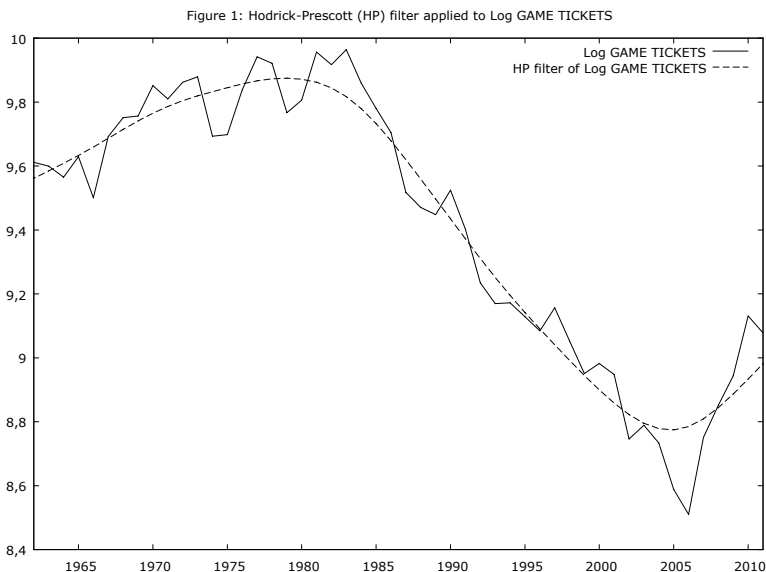
of the league and players' behaviour. In fact, reputation of many actors involved appears to be very low. In this context, therefore, Italian stadiums' population has decreased dramatically from about 33,000 spectators on average in the 80s, with a maximum of more than 38,000 average ticket sold per game in 1984, to less than 24,000 on average in the last ten years.

There may be several reasons behind this phenomenon. In a previous paper Di Domizio (2007) argued that the stadium depopulation is due to the violence in stadium and to the reduction in credibility of the system. According to the long run econometric investigation performed on average attendance time series, the hypothesis of a negative trend starting in the season 1979/80 cannot be rejected. In this season, known as the «*black year of Italian football*», in fact, two events occurred: first, the death of Lazio fan Vincenzo Paparelli hit by a rocket shoot by the AS ROMA supporters on 28th October 1979 at the Olympic Stadium; second, the first sensational match fixing episode involving popular players, managers and owners of top <u>teams who ended up to be relegated in lower divisions</u>. Some players of SS LAZIO, for example, were arrested at the end of the match played in Pescara on 23th march 1980 leaving the stadium with handcuffs.[5]

According to an econometric investigation, these episodes introduced a break in the series which, however, was overtaken in the middle of 80s when average attendance registered its maximum level (about 38,000 in the season 1984/85). A number of changes occurred in *Serie A*, after the season 1979/80, leading to the peak in stadium attendance: a) the access of quotas of foreign players; b) the enthusiasm generated by the success of Italian national team at the World Cup 1982; c) the comeback of AS ROMA among the top teams in Serie A so challenging the previous supremacy of Juventus F.C. . All these events limited or masked the decline in stadium attendance which begun in season 1979/1980.The idea of a structural break is supported by a visual test performed by the means of a

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[5] Tavella (2006).

Hodrick-Prescott Filter to the *GAME TICKETS* series as shown in figure 1.

Figure 1: Hodrick-Prescott (HP) filter applied to Log GAME TICKETS

As shown in the figure 1, the filtered series of *GAME TICKETS* has a peak before the season 1984/85. The hypothesis of a structural break was tested by estimating an OLS regression with heteroskedasticity correction (HAC) on the *game tickets* series.

The list of regressors includes the average of *seasonal tickets* sold, published by the "almanacco del calciopanini", supposing a possible substitution effect with the dependent variable. The *game tickets price* was the average price computed as the ratio between the total revenues and the number of tickets sold per game. . Another variable was introduced to take into account the market size of teams playing in the championships. We considered a variable of rank for which big cities have little rank. for this reason the expected sign of the associated coefficient is negative. A dummy variable (*tv coverage*) was added in order to take into account the television coverage that, starting from season 1993/94, included 28 matches on sunday night, and

from season 1999/00 almost all the matches. The dummy *tv coverage* equals 1 for all the seasons started from 1999/00 up to now. Two variables were added to take into account the capacity of attraction of the tournament; the first is *goals* including the average goals scored in the season, and the second is the *gini* index associated to the final ranking in the championship. The expected sign is positive for the first variable and negative for the second. Both variables were one-year lagged in order to to take into account the existence of long run effect on attendance. Two other variables were introduced in the regression to catch possible changes in the preferences of leisure ; namely *theatre & music* and *cinema*. The first denotes the number of tickets sold for theatre, musical events, ballets and other; the second the number of tickets sold for cinema.[6]

Three other control variables are introduced in the regression: *oil price*[7], *gdp per capita* [8]and the *unemployment rate*[9]. Evidenlty, the variables denoting income and unemployment are supposed to capture the impact of economic and social context on football attendance. The presence of oil price in the list of regressors, instead, can be interpreted in two ways. On one hand, given that Italy has always been a net importer of oil, any increase in oil price, eventually evolving into an increase in inflation, may turn to be as a proxy of social distress, On the other hand, a sticky rise in oil price is an evidence of a growing economy.

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[6] Data refer to tickets sold each 1000 habitants; see ISTAT, Italian Statistics Archive, and SIAE Annual Report 2010 and 2011. Since data refer to solar year and sport variables refer to tournament year each data includes the average of the two years associated. For example, data on *Game Tickets* for the season 1995/96 is associated with the average data on *Cinema* and *Theatre & Music* for the years 1995 and 1996. Data on 2011/12 includes only the 2011 since data on 2012 are still not available.

[7] Oil spot crude price (brent) in US $ (2010) per barrel: source: 1962-1975 www.economicwebinstitute.com on data British Petroleum (BP). 1976-2012: BP, Statistical Review of World Energy (data 2012 refers to the average from January to June). Data are inflated by the CPI inflation calculator available on United States Bureau of Labour and Statistics.

[8] Data are expressed in € 2010. Source 1962-1980: ISTAT. 1981-2012: IMF [data of 2012 is based on IMF forecast of -1.9% (August 2012)].

[9] Source ISTAT, market labour indicators.

In addition, it should be pointed out that, as for the *theatre & music* and *cinema* data, the economic variables are expressed in average of the two years of each championship associated. With the exception of dummy variables descriptive statistics are presented in table 1.

Variable (in Log)	Obs.	Average	Min	Max	Median	Std. Errors
Table 1 – Descriptive statistics						
game tickets	50	9.41	8.51	9.964	9.521	0.424
seasonal tickets	50	9.61	8.71	10.02	9.658	0.313
game tickets price	49	32.5	23.3	40.47	33.22	4.279
goals	50	0.83	0.63	1.031	0.809	0.123
gini	50	0.26	0.19	0.35	0.251	0.034
theatre and music	50	6.01	5.28	6.38	6.143	0.331
cinema	50	8.15	7.32	9.54	7.604	0.804
oil price	50	3.52	2.34	4.66	3.486	0.693
gdp per capita	50	9.75	8.88	10.22	9.825	0.413
unemployment rate	50	2.08	1.41	2.49	2.100	0.297

The equation is estimated firstly including the sport and market size variables (column 1) and, then, adding control variables. Results are shown in table 2.

The idea suggested by the hodrick-prescott filter analysis is supported by our estimation. In details, the null hypothesis that coefficients associated to sport variables (*goals*, *gini*) are zero cannot be rejected. This confirms the difficulty of researchers to catch both the appeal and the closeness of competition in the long period by the means of typical sport variables. The positive sign of coefficient associated to unemployment suggests that football can be considered an inferior good. The coefficient for *gdp per capita* is positive, but insignificant. this result fits well with relationships emerged with variables *theatre & music* and *cinema*. Theatre, musician, opera and ballets are often considered less popular than sport and cinema entertainments. The negative relationship between attendance and *theatre & music* and the positive association with *cinema* confirms the idea of football as popular good. Eventually, it seems that oil price, as proxy of economic growth, suggests a positive relationship between attendance and economic growth.

In brief, after we verified the existence of a structural break in a long-run trend , we can maintain that the events of season 1979/80 shocked the public opinion, so affecting negatively the stadium attendance. However, the public opinion reproach was not followed by effective policy measures to control the violent drift, particularly inside the stadium. During the 80s and 90s there were a great number of violent episodes which eventually led the government to implement the first special laws in the 1989. The hooligan violence took the shape of «anti-system actions» since many supporters' violent groups, although belonging to different teams, joined each other against the policemen the preferred target of the *ultras,* (Porro, 2008). In the 1999, after the death of four supporters of US SALER-NITANA in a train fire determined by the widespread attitude to violence and vandalism, the government created the National Observatory on Sport Events with the scope of analysing the phenomenon of soccer violence and coordinating strategy to counter it. But the turning point in the strategy against stadium violence was in February 2007. The death of the policeman FilippoRaciti, killed during clashes in occasion of the Sicilian derby between Catania and Palermo, induced the Italian government to introduce sharper counter-measures in order to ban violence from Italian stadiums.

TABLE 2: OLS ESTIMATION WITH HAC CORRECTION. 48 OBS. IN TIME SERIES. Dependent variable: *GAME TICKETS (Log)*		
CONSTANT	**3.563****	**5.883*****
	(1.32)	(2.00)
game tickets (-1)	**0.838*****	**0.585*****
	(0.113)	(0.162)
game tickets price	**-0.011*****	**-0.249***
	(0.003)	(0.146)
seasonal tickets	**-0.105****	**-0.173***
	(0.042)	(0.090)
rank	**-0.135*****	**-0.147*****
	(0.032)	(0.034)
tv coverage	**-0.074***	**-0.130****
	(0.036)	(0.053)
goals	0.184	-0.018
	(0.265)	(0.09)
goals(-1)	**-0.348****	-0.147
	(0.153)	(0.139)
gini	0.112	0.170
	(0.671)	(0.591)
gini(-1)	-0.531	-0.215
	(0.317)	(0.344)
theatre & music		**-0.636****
		(0.266)
cinema		**0.153***
		(0.088)
gdp per capita		0.197
		(0.236)
oil price		**0.161****
		(0.073)
unemployment		**0.610*****
		(0.204)
$\overline{R}^2$	0.96	0.96
St. err. Res.	0.087	0.084
F Stat	229.7***	276.63***
Schwarz Criterion	-71.33	-61.64
Akaike Info Criterion	-90.04	-89.71
Hannan-Quinn	-82.98	-79.10
d Durbin Watson		2.013
h Durbin	0.046	
Chow Test Structural Break	6.03	489.45
1979	p=0.76	$p \rightarrow 0$

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2. *The strategy against stadium violence in Italy: a brief overview*

Sport-related is not a new phenomenon. In general, it recalls the idea of a multi-shaped definition of sport as expounded in Caruso (2011). There sport has been defined as: «*a joint indivisible good, which is produced and consumed by different agents at a certain place and time. It can have multiple shapes. In fact, it is a combination of: (i) a market good, (ii) a relational goodand (iii) an expression of threat, power and coercion. All components differ in intensity, but differently from (i) and (iii) the relational component must be necessarily positive.*» Such a definition extends that presented in Downward and Riordan (2007) builds on Boulding (1973/1978).

Different interpretations have been produced. Violence in sport context has been interpreted as a consequence of the frustration generated by a defeat (Bandura, 1973). In football other factors act to open the soccer scenes to the development of violent episodes: football is a team sport, it is associated to a community sense of belonging and depicts a conflict. Echoing Elias and Dunning (1989) the football match stylizes and miniaturizes the war. In particular, Dunning (1999) explains that for young men football hooliganism is basically masculinity, territorial struggle and excitement.

Evidently, violence in sport contexts cannot be considered a modern phenomenon. As mentioned in Serra and Pili (2003) in the 1314 the major of London was enforced to forbid the *hurling over country* - a game played by the surrounding villages in which a ball made by clothes had to be carried to the opposite village - because of disorders associated. The violence did not decline after the codification of rules in the English professional football in the XIXth century; this first attempt of a modern organization was followed by the diffusion of the *moral panic* through the football environment because of the transmission of violent attitudes of the *working class*, the hard core of football supporters.

The forms of soccer violence evolves, particularly in England, till to assume the form of the *hooliganism* that, after the tragedies at Heysel and Hillsbourough Stadiums, in May 1985 and April

1989 respectively, determined the ban of English teams from European tournaments up to 1991.[10]

The diffusion of hooliganism, in almost all European contexts, stimulated the debate both in sociological and economics perspectives. Interesting contributions were provided by Leeson, Smith and Snow (2012) aiming at incorporate the presumed thoughtless actions of hooligans in a framework of rational behaviour. This in order to identify the optimal counter strategy of government and policies.[11]

For English football the counter hooliganism strategy represented an opportunity to reform the system; in this direction the new Premiere League has became a reference model for others European professional leagues. The same has not been for Italy. The Law 13th December 1989 was not able to contain the violent attitude of organized hooligan groups. As pointed out by the Italian «LegaSerie A»,[12] violence did not reduce its intensity and the later law interventions in 1993 (Law 205), 2003 (Decree 24th February n.28 and Law 88), 2005 (Law 17th August n.168 and Law 17th October n.210), did not achieve the expected detrimental effect. The Decree n.8 of 8thFebraury 2007 (successively converted by Law 41) was expected to be turning point of the counter strategy against soccer violence. The strategy is centred on several points: *i)* closed doors for unlawful stadiums; *ii)* prohibition of cumulative tickets selling for away team fans; *iii)* increase of punishment for violent fans; *iv)* introduction of penalties for clubs supporting fans organizations involved in violent episodes. From an operative perspective a central role was attributed to the National Observatory for Sports Manifestations (from now on Observatory). It was instituted in 1999 by the State Police to collect information about violent phenomenon and to profile the public order risk of sport events. The Observatory assigns a risky code to each sport event. Once the risky code is formalized, the Observatory may

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[10] For a complete report about the above mentioned tragic events see Lord J. Taylor (1990).

[11] See Marie (2010) and Poutvaara and Priks (2009).

[12] The league dedicated a permanent page on its web site listing the names of people dead because of soccer violence (http://noallaviolenzaneglistadi.it.gg/I-morti-del-calcio-italiano.htm).

suggest restrictions to supporters in sport facilities, particularly for away team supporters. From 2008 (Decree 15th August) the Observatory activity was supported by the Committee for the Analysis and Safety of Sport Manifestations (from now on Committee); it has the operative power to introduce restrictions which intensity depends on the risky code identified by the Observatory. They can be classified by deterrence strength and listed as follows: *a*) no spectators admittance; *b*) admittance restricted to seasonal ticket holders; *c*) closing of away team fans stadium area; *d*) selling of tickets restricted to the population of region, province or town of home team; *e*) no cumulative selling of tickets.

Together with rules introducing selling/entry restriction, the Law 41 at the article 8 (comma 4) discloses to the clubs the opportunity of stipulating some conventions or agreements in order to promote the sports culture values, of non violence and peaceful coexistence. This could be considered the first opening to the fidelization process between clubs and fans, institutionalized by the «fidelity fan card» strategy. The project, approved in May 2008 and successively regulated by decree 15 August 2009, was, in the intention of government, a fundamental tools able to create a new, solid and transparent link between clubs and own fans. Became obligatory in the season 2010/11 for seasonal ticket holders, the fidelity fan card met strong oppositions: because of the presumed scheduling process of fans, the exclusion of fans banned by stadium in the previous five years, the business profile of the project (Garraffa, 2011). This oppositions produced some changes with respect to the initial idea, forced by the State Council decision that declared the card illegal for that part in which it was combined with a revolving card released by a commercial bank.[13] The sports authorities receipted the jurisdictional pronouncement, modifying some features of the card, and leaving more power to the clubs as specified in the Protocol of Agreement signed by Minister of the Interior, Italian Football Federation, Olympic Italian Committee and the three Italian Professional Leagues on the 21th June 2011. Our goal is not to discuss the opportunity and the

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[13] See Council State sentence, Section VI, n. 5364 of 7th December 2011, available on www.altalex.com (June 2012).

efficiency of the fidelity fan card tools from a public order point of view, but to seize the effect, if anyone, of the counter strategy adopted by Italian government on stadium attendance in *Serie A*.

3. *Antiviolence strategy and attendance: a short period investigation*

This section presents the econometric investigation aiming at analyzing the variables that influence the attendance at single match level. In particular, we focus on the impact of the antiviolence measures, set by Italian authorities, on the number of per-game tickets sold in *Serie A* from season 2007/08 up to 2011/12.

   The panel data set includes 306 matches among 18 teams that played at least four times out of five from the 2007/08 up to the 2011/12 season.[14] Some missing matches due to the relegation in *Serie B* of some teams, to the aversion of teams to provide data on attendance, and to their patent inconsistency reduced the set in 1227 observations distributed in 289 cross section units repeated in time for a length from two till five years.[15]

   As dependent variable we selected the per-game tickets (*Game Tickets)* sold.[16] Each dependent variable observed could be indicated with a subscript, *h-a, t*, where *h* and *a* stand for the home and away team respectively, and *t* indicates the season.

   First of all, potential time correlation of *Game Tickets* was taken into account introducing among regressors the lagged (one pe-

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[14] Teams are: Atalanta, Bologna*, Cagliari, Catania, Chievo Verona*, Fiorentina, Genoa, Inter, Juventus, Lazio, Milan, Napoli, Palermo, Parma*, Roma, Sampdoria, Siena and Udinese; *indicates teams relegated in Serie B in one season. Data collected for our econometric investigation are about 50,000 from different sources.

[15] Missing data refers to the home matches played by Cagliari; the club does not provide official data on single match attendance. Other data are not included in the panel because of several matches were played without crowd or with sole seasonal ticket holders; other data are clearly off beam (for some matches total attendance reported is less than seasonal tickets sold), and in this case the associated match was excluded from the sample.

[16] Data on single match attendance are available at *www.stadiapostcards.com* in section «archivi» (September 2012).

riod) values of the dependent variable. This is plausible in the presence of committed supports as it is the case in many sports. This reduces the size of the sample used for the econometric investigation into 845 observations distributed in 282 cross section units with length from one till four years. We selected *Game Tickets* rather than total attendance for two reasons: 1) to highlight the impact of independent variables on uncommitted and occasional spectators; 2) second because the government strategy against violence impacted on the number of seasonal tickets binding the fidelity card subscription for seasonal ticket holders. This obviously influenced the potential sale of single game tickets and for this reason we included in the list of regressors the average of the seasonal tickets sold by the home team (*Seasonal Tickets*). Data on seasonal and per game tickets were collected by the same source.

The independent variables can be divided in five groups.[17] The first includes variables able to outline the economic context in which the match is played. Since data on added value and/or income are not available at province level for the whole period under investigation, we used as a proxy for the local economic performance the (provincial) annual average employment rate (*Home Team Employment Rate*).[18] The second variable proxies the price tickets.

As known, the identification of the price for a single match is not a trivial matter, both on theoretical and empirical perspective.[19] Bird (1982), looking for price ticket elasticity of football demand, used the minimum admittance price as a part of the cost of live attendance. The same variable was used by Dobson and Goddard (1992), but excluded from their regression, because of it was enable to capture the genuine price effect on demand. Since official data on single match price are not provided by clubs or league, we used an

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[17] For details about attendance estimation see Dobson and Goddard (2001) and Downward and Dawson (2000).

[18] On the use of labour indicators as a proxy for the economic environment influencing the attendance see Borland (1987), Borland and Lye (1992), Dobson and Goddard (1996), Falter and Pérignon (2000).

[19] See, among others, Simmons (2006), Feehan (2006), Sandy, Sloane and Rosentraub (2004).

aggregate index of football matches prices provided by ISTAT as a part of the Consumer Price Index information.[20] The index (*Tickets Price Index*) is the ratio between Football Match Price Index and Consumer Price Index. This is a variable that proxies the relative price of single match at a monthly frequency, that we associated to matches played at that time. A second index proxies travel costs (*Fuel Price Index*) as a part of the cost for the away team fans for live attendance. It was computed using the ratio between Fuel Price and Consumer Price indexes. The expected sign of coefficients associated to both variable is negative.

The second group includes demographic and geographic variables: the *Home Team Town Population* and the *Away Team Town Weighted Population*. These variables try to catch the market size effect on the attendance as suggested by Cairns (1987) and Buraimo and Simmons (2006). The home team town population refers to the residents at the middle (31th December) of the season under investigation; data are published by Italian National Institute of Statistics (ISTAT)[21]. The second variable is computed weighting the away team town population by the distance between home and away team cities. The distance has been obtained by using the Michelin Itineraries Guide[22] that promptly calculates, on line, the best route to reach the city of hosting team from the away team town. The distance is expressed both in minutes of travelling time (*Distance in Minutes*) and in kilometres (*Distance in Kilometres*). When multiple suggestions are offered we selected the less expensive one. Note that the town population has been corrected to take into account that some cities have more than one team; for this reason data on Inter, Milan, Juventus, Genoa, Sampdoria, Roma, Lazio and Chievo Verona has

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[20] The difficulty of catching price effect on football demand arises also by the segmentation of stadium areas reflecting a wide range of admission prices for each single event.
[21] ISTAT, Demographic Indicators, available in *www.demo.istat.it* (July, 2012).
[22] Data are promptly derivable on *www.viamichelin.it* (March, 2012). For derbies played by teams placed in the same town distance has been approximate by 0,0001 for convenience.

been divided by two.[23] The expectation is for a positive sign of both variables.

The third group includes match quality variables. They refer both on uncertainty of outcome and on expected attractiveness of matches. Proxies for the variables are derived from betting odds market as done by many authors [Peel and Thomas (1988), Kuypers (1996), Czarnitzki and Stadtmann (2002)], Forrest and Simmons (2002), Forrest, Simmons and Buraimo (2005)]. Data are extracted from *Football-Data*[24] archive that collects odds associated to the Italian championships since season 2000/01. Given the strong correlation among odds offered by many bookmakers, we selected those proposed by *Bet365* because it has the more comprehensive coverage.[25]

With respect to the uncertainty of outcome we calculated the presumed probabilities associated to the match result, *Home Team Win Probability*, *Away Team Win Probability* and *Draw Probability*, as suggested by Buraimo, Forrest and Simmons (2008). The authors also discussed the shortcomings in using odds as a proxy for the uncertainty of outcome of matches. As a proxy for uncertainty we used *Draw Probability* together with the *Theil Measure*. This index, suggested by Peel and Thomas (1992) and used firstly for the Italian context by Di Domizio (2010), evaluates the closeness of the odds associated to the three match results. It tends to zero for completely unbalanced probabilities distribution, and to 1,0986 (*ln 3*) for perfectly balanced expected match. The expectation is for a positive sign of both variables discussed. As a proxy for the attractiveness of the match we used odds associated to the expected number of

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[23] The population associated to Chievo Verona is that of Verona even Chievo is a little neighbourhood of the city including about 4,500 people, as indicated by the local parish. No significant differences in estimation results comes from the use of this data instead of the first.

[24] All data are available on line at *www.football-data.co.uk/italym.php* (June 2012).

[25] Odds for matches between Chievo Verona-Bologna (season 2010/11) and Bologna-Catania (2009/10) not quoted by *Bet 365* we used *Bet&Win* and *Blue Square* data respectively.

goals.[26] We suggest two measures: the first is the odd associated to the event "more than 2.5 goals" (*Over 2.5*), the second is the ratio between odds associated, respectively, to the events "more than 2.5 goals" on "less than 2.5 goals" (*OVER 2.5/UNDER 2.5*). For both measures an increase indicates a reduction in the expectation of the number of goals scored and, consequently, the expected sign of the parameter associated is negative. Another variable approximating the quality of match refers to the talent of teams. We calculated a *Wages Ratio* dividing the amount of home team players' wages by the sum of home and away team players' wages.[27] This in order to evaluate the relative quality of home team with respect to the away team roster.[28] The expected sign is negative since possible «superstar effect» could emerge when the ratio decrease dramatically for matches in which top teams play away.

The fourth group of variables focuses on the public order environment in which the match is played, together with the strategic profile pursued by the government in fighting stadium violence. As reported in previous section, starting from the season 2007/08, each single match played in professional and non professional Italian football leagues, together with matches of many other sports, are monitored by the National Observatory on Sport Manifestations. This control allows the Observatory to signal matches under public order risk, delegating the National Committee for the Analysis on Sports Manifestations for the measures to apply to null the risk of disorders. For this reason we went over all the Observatory and Committee determinations; starting from August 2007 up to May 2012, we introduced a *dummy* variable (*Risky Matches*) equals to 1

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[26] Betting odds on the expectation of the number of goals scored are archived by Football-Data that reports the average value of odds for a number of bookmakers varying from 4 to 47.

[27] Data on wages were extracted from La Gazzettadello Sport, Italian sports newspaper, which provides data at the start of each season for the whole *Serie A* roster.

[28] Players' wages have been widely used by sports economics literature in order to evaluate the expected competitive balance within a league; see for example Fort and Quirk (1995) and Vrooman (1995).

for matches identified with high risk.[29] Together with this risky code we added a dummy (*Fidelity Card Exemptions*) that signals matches under risk for which Observatory and Committee introduced entry restrictions exemptions for fans joining the fidelity fan card program.

In the fifth and last group we introduced three dummy variables. The first points out matches played from Monday to Friday (*Working Days*). The two others *2010/11* and *2011/12* signal matches played in the seasons 2010/11 and 2011/12, respectively, because of from August 2010 the fidelity fan card become compulsory for seasonal ticket subscribers.

Descriptive statistics of non-dummy variables, expressed in natural logarithm (*Log*), are in table 3 below.

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[29] All the Observatory and Committee determinations are available on line in the section «determinazioni» at *www.osservatoriosport.interno.gov.it/determinazioni* (July, 2012).

	Obs.	Avg	Min	Max	Med	SD with	SD be-tween
Table 3 - Descriptive statistics							
Game Tickets	1227	8.68	1.099	10.96	8.68	0.594	0.897
Seasonal Tickets	1274	9.66	8.411	10.67	9.69	0.191	0.502
Tickets Price Index	1330	0.13	-0.04	0.29	.12	0.051	0.022
Fuel Price Index	1330	0.10	-0.17	0.33	0.13	0.154	0.043
Town Popula-tion	1330	12.75	10.89	14.14	12.81	0.031	0.887
Distance in Kilometres	1330	5.98	$\rightarrow 0$	7.28	6.23	0.047	1.11
Distance in Minutes	1330	5.77	$\rightarrow 0$	7.15	5.87	0.031	1.12
Home Team Win probabil-ity	1330	-0.87	-3.05	-0.15	-0.81	0.18	0.35
Away Team Win probabil-ity	1330	-1.44	-3.32	-0.17	-1.38	0.24	0.47
Draw Prob-ability	1330	-1.27	-2.26	-0.39	-1.23	0.12	0.13
Theil Measure	1330	0.00	-0.72	0.09	0.05	0.07	0.09
Over 2.5	1330	0.67	0.90	0.27	0.68	0.08	0.07
Over 2.5/ Un-der 2.5	1330	0.08	-0.88	0.49	0.11	0.15	0.14
Home Team Employment Rate	1330	4.085	3.59	4.28	4.16	0.02	0.18

4. Estimation results

The equation was estimated by a Fixed Effect model with Arellano correction for eteroscedasticity; results are reported in table 4. As shown in columns 1 and 2 of table 3 almost all coefficients are significant and show the expected sign. Tests performed on different models suggest to prefer Fixed Effect over the Pooled OLS and the Random Effect models. Interesting is the magnitude of coefficient of *Tickets Price Index*; in our model it represents punctual elasticity of football demand with respect to price and, as suggested by theoreti-

cal literature on monopolistic firms, clubs fix prices in the elastic section of demand. This contrasts with many empirical investigations performed on demand for different sports in different countries, where teams behaviour seems to be opposite with the maximum profit profile.[30]

Geo-demographic variables presents conflicting results. The signs of coefficients associated to *Home Team Population* and *Away Team Town Weighted Population* are opposite and their significance depends on the model selection. The positive effect on attendance of home team market size and the negative of the away team, even weighted by the distance in kilometres, suggest that are not from big and near metropolis that fans come in crowds toward cities hosting the match.

As lengthily debated in the literature, the impact of the uncertainty of outcome on attendance is not obvious. This depends on the variables selection, on econometric shortcomings and other factors. In our empirical investigation we introduced the *Draw Probability* and the *Theil Measure* to proxy the closeness of the match. If the sign associated to the *Draw Probability* (+) supports the hypothesis of a positive effect of uncertainty on attendance, the one of the *Theil Measure* (-) leads toward the opposite idea. Possible explanation of the coherence of this results can be found on the «superstar/big team effect».As confirmed by the statistical significance of the variable *Wages Ratio*, when the relative quality of home team decreases with respect to the away team, we observe an increase of the attendance. Monitoring data of wages for all teams playing in *Serie A*, we note that the ratio reduces dramatically when little or medium teams play home against big teams. In this case, the decrease in attendance induced by the reduction in the win probability of the home team is fully compensated by the opportunity of occasional fans to watch big teams and/or big players live.

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[30] See Villar and Guerrero (2009).

TABLE 4: ESTIMATION RESULTS ON DATA PANEL - Dependent variable: *Game Tickets (Log)*

Variables in Log	1	2
Constant	-8.992 (11.063)	-4.996 (11.068)
Risky Matches		**-0.302*** (0.086)
Fidelity Card Exemptions		**0.226*** (0.085)
Game Tickets (-1)	**-0.15*** (0.045)	**-0.155*** (0.045)
Seasonal Tickets	**-0.08*** (0.009)	**-0.073*** (0.008)
Tickets Price Index	**-1.103*** (0.408)	**-1.285*** (0.414)
Fuel Price Index	-0.159 (0.299)	-0.109 (0.298)
Home Team Employment Rate	**2.747*** (1.525)	**3.794*** (1.548)
Home Team Population	**1.246*** (0.632)	0.829 (0.651)
Away Team Town Weighted Population	-0.946 (0.577)	**-1.379*** (0.570)
Draw Probability	**0.681*** (0.203)	**0.670*** (0.197)
Theil Measure	**-2.11*** (0.425)	**-2.067*** (0.415)
Over 2.5	**-0.743*** (0.344)	**-0.632*** (0.341)
Wages Ratio	**-0.501*** (0.221)	**-0.575*** (0.219)
Working Days	**-0.154*** (0.062)	**-0.155*** (0.063)
2010/11	**0.536*** (0.061)	**0.530*** (0.062)
2011/12	**0.434*** (0.109)	**0.414*** (0.108)
R squared	.768	.772
St. errors res.	.488	.484
Variance 'within'	0.239	0.234
Variance 'between'	0.092	0.092
Breusch-Pagan test (p-value)	0.924 (0.336)	1.101 (0.313)

Notes: standard errors in parenthesis. Statistical significance:***>99%. **>95%. *>90%. 845 data included in 282 cross section units. Time Series Length: min 1. max 4

No doubts appears to be on the relevance of the attractiveness of the match approximated by the expected goals. The sign of coefficient associated to *Over 2.5* acts in the expected direction and its impact is not small.

As regards to variables that collocate matches in time is important to stress the negative effect on attendance of fixtures in the middle of the week or in non-working days. This effect could be quantified around 1,000 game tickets less per game.

The last group of variables to discuss refers to the policy adopted by the Italian government and sports authorities to counter soccer violence. From our point of view results are of great interest. The sign of coefficients of both dummies, *Risky Matches* and *Fidelity Card Exemptions*, suggests that the entry restrictions, introduced by the Committee for selected matches considered under risk by the Observatory, impacted on attendance negatively. The detrimental effect of the entry restrictions imposed on away team fans exceeded the positive one on home team occasional fans induced by the reduction in the risky profile. This negative effect can be quantified around 1,800 game tickets less. Together with the negative effect of the entry restriction, from our empirical investigation emerges the positive impact of the fidelity card strategy on per game tickets sold. However, according to our results, when exemptions to the entry restrictions are allowed to the fidelity card holders, the cumulative effect on attendance is around 500 game tickets less. This result could disclose to a not so negative evaluation of the fidelity fan card strategy opened in the season 2009/10 by some teams and successively extended to the whole professional leagues. But in this direction two other questions arise. First, the ability of the fidelity fan card strategy to elude entry restrictions should be evaluated in the light of the strong reduction in the average of seasonal tickets sold. From the season 2010/11, when the fidelity fan card became compulsory for seasonal ticket subscribers, their average number reduced of about 13% in the following two seasons. This hypothesis is also supported by the positive coefficients associated to the dummies *2010/11* and *2011/12*, suggesting that the increase of the game tickets was only a partial compensation of the reduction in seasonal tickets selling,

driven by the opposition of organized fans against the commercial profile associated to the fidelity fan card. Second, the positive effect of the fidelity card strategy must be considered poor if evaluated in the light of the negative trend characterizing the average attendance in Italy from the 80's. If the target of sports authorities and government was to reduce the public order risky profile of matches it could be considered achieved.[31] On the contrary, if the scope of sports authorities and government was the one announced in the Decree 15th August 2009, aiming at introducing the fidelity fan card project to create a new and heartfelt relationships between teams and fans, they cannot say to have reach it. This is not only for the several jurisdictional controversies generated by the commercial profile of the fidelity fan card for which the State Council declared the fidelity fan card illegal [Garraffa (2010, 2011)].[32] We refer to the controversies involving the League as a whole, a number of single clubs that never agreed with this project, the hard core of fans that boycotted the project and the government. As commonly known the initial idea of the fidelity fan card has been translated into a new (at least in the intention of government) involving clubs more than before. This is part of the agreement protocol signed by Minister of the Interior, Italian Football Federation, Olympic Italian Committee and the three Italian Professional Leagues on the 21th June 2011. Even if the fidelity fan card was confirmed as a necessary tools to follow the own team away and to subscribe seasonal tickets, the clubs had the opportunity to release special «vouchers» for a number of matches to the non-fidelized fans, cracking the ideal framework from which the fidelity fan card project was generated.

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[31] In the agreement protocol signed on 21th June 2011 the Observatory of Sport Manifestations claims for a reduction of matches with injuries of 20 per cent between seasons 2009/10 and 2010/11 and of 56 per cent if compared to the season 2006/07.

[32] See Consiglio di Stato, Sez. IV, ord. N. 5364, 7th December 2011 on www.altalex.com.

Conclusion

The paper investigates the effect on Italian football demand of anti-violence strategies introduced by Italian government with Decree n.8 of 8th February 2007. The empirical analysis, based on *Serie A* data, was performed both on long and short period perspective. By the first we show that violent contexts, together with illegal behaviour of football actors, can be considered one of the most important determinants of the negative trend of attendance from the end of 70s. In fact, in the long run empirical investigation, profiled on per-game tickets sold in *Serie A* from season 1962/63 until season 2011/12, the peculiar nature of football demand emerged with respect to other leisure time consumption goods or services (theatre, music and cinema) and economic variables (unemployment and inflation), together with the role of TV coverage in determining the size of live attendance.

Eventually, the short period investigation was performed using data at single match level of *Serie A* from season 2007/08 until 2011/12. Data on 1330 matches, played among 18 teams, were collected creating a panel set including 289 cross section units with time length variable from 2 up to 5. The independent variable, the per-game tickets; was estimated using a list of regressors including economic, geographical, demographical and sport factors. In addition, two dummies were included in order to profile the Italian strategic behaviour to counter soccer violence. As suggested by several tests performed on different econometric models, the equation was estimated by a Data Panel Fixed Effect Model with Arellano correction for eteroscedasticity. The robustness of the model specification is confirmed by signs and significance of coefficients associated to the selected independent variables. Main results of the econometric investigation could be summarized by the following items:

a) a relevant influence of economic factors in determining attendance, as showed by the sign and magnitude of coefficients associated to *Tickets Prices Index* and *Employment Rate*. Interesting is that the price imposed by teams acts in the elastic section of demand confirming a profit oriented behaviour of clubs. This also disclose the

possibility for price reducing strategies aiming at increasing both to-
tal revenues and attendance.

b) the positive effect of *Draw Probability* supports robustness of the
uncertainty of outcome hypothesis; this result contrasts with the
negative effect of *Theil Measure* and *Wages Ratio* suggesting the hy-
pothesis that attendance is driven mainly by super-star or super-team
(playing away) effect.

c) a positive effect of the attractiveness of the game measured by the
expected number of goals.

d) a strong negative impact of restrictions imposed by Observatory
for the National Sports Manifestations and by the Committee for the
Analysis and Safety of Sport Manifestations on away teams' fans
live participation that can be measured, on average, in about 1,800
game tickets less per game.

e) a positive impact of the Fidelity Card exemptions strategy that
compensated the entry restrictions on away fans for about 500 per
game tickets. However, the net effect on occasional attendance re-
mains negative, and can be quantified in about 1,300 per game tick-
ets less.

Points d) and e) confirm that the expected substitution effect between
committed and uncommitted fans driven by the fidelity fan card pro-
ject failed. The negative net effect of counter violence strategies, in-
troduced by Law 41/2007, must be also interpreted in the light of a
reduction of the seasonal tickets because of the opposition of organ-
ized fans toward the commercial profile of the fidelity card.

Even though the new strategies were able to reduce the per-
ceived risk riskness, they have not reversed the negative tendency of
stadium depopulation that appears to be, at the time, one the most
relevant shortcomings of the Italian professional football. In order to
invert this trend, leagues, federation managers, teams and govern-
ment are called to elaborate new ideas and interventions in different
areas:

> *A)*   in restoring credibility of football environment
>   undermined by old and recent referees corruption
>   episodes and match fixing scandals;

B)   in modulating TV coverage of matches introducing black-out rule for matches with low attendance;

C)   in re-distributing TV rights revenues rewarding teams with high percentage of stadium occupation;

D)   supporting new investments on stadium facilities in order to create more commercial opportunities for teams, but also more suitable and fascinating environment for fans' live participation.

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