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Crime and Sport Participation in Italy: Evidence from Panel Data Regional Analysis over the Period 1997-2003

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JEL Classification Codes: L83, D62

Keywords: Sport participation, relational goods, crime

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**CRIME AND SPORT PARTICIPATION IN ITALY.
EVIDENCE FROM PANEL DATA REGIONAL ANALYSIS OVER THE PERIOD 1997-
2003.**

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Introduction

In the latest years, a growing attention on sport emerged. The common wisdom about sport participation takes for granted the idea that a beneficial impact of sport on society is predictable. The Commission of European Union, for example, in 2007 released a white paper on sport which emphasizes the beneficial impact of sport on society¹. The White Paper defines "sport" as "*all forms of physical*

¹ COM(2007) 391 final, Presented by the Commission: SEC(2007) 932, SEC(2007) 934, SEC(2007) 935, SEC(2007) 936, available at http://ec.europa.eu/sport/white-paper/index_en.htm (April 2009).

activity which, through casual or organised participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels." In particular, the white paper stresses some specific benefits related to sport participation as: (i) public health through physical activity; (ii) reinforcement of human capital thanks to development of knowledge, motivation, skills and readiness for personal effort; (iii) active citizenship, social inclusion and integration. In brief, sport seems to enhance both individual and social well-being. Moreover, the white paper also focuses upon the importance and peculiarities of professional sport industry. Albeit many significant shortcomings, the White paper has the merit of recognising that sport has a role which goes beyond the mere competition between individuals or teams.

Needless to say, as noted above, the white paper rests to a large extent upon the widespread idea that sport is a beneficial for society. But please consider that this is a modern idea. In medieval societies, for example, sport was considered the peacetime occupation of the nobles whose main business was represented by war. In sum, sport participation was not presented as enjoyment or leisure but it would descend from warring attitudes of men. It was somehow ancillary to the training for war. There was no beneficial impact on society at that time.

Hence, in this paper I am concerned with that point of view which assumes a beneficial impact of sport on society. I do not want necessarily propose a different way of thinking. I only want to highlight some points we might look in order to better evaluate the societal role of sport participation. In fact, the aim of this paper is tackling this crucial point by studying empirically whether or not there is a **relationship between sport participation and crime**. That is, the approach here is that of studying the potential benefits of sport participation indirectly. Instead of choosing a disputable aggregate measure of well-being, it is assumed that fewer (or less intense) negative factors can lead to more desirable social outcomes. In fact, *ceteris paribus*, henceforth I assume that a social outcome exhibiting fewer crimes must be preferred to a social outcome characterized by a higher level of crime. Hence, in common-sense terms, the impact of sport participation on crime is expected to be negative.

However, the association is not so clear when considering different types of crime. For example, if we can consider the negative association between individual crime and sport predictable, we cannot do the same with organised crime and juvenile gangs' phenomenon. In many cases, for example, juvenile crime and violence emerge in the presence of juvenile groups clustered around sport participation identity. Narratives of hooliganism sadly confirm this. Moreover, other studies pointed out positive associations between sports and increased problem behavior. For example, young athletes have higher levels of alcohol use, binge drinking and an increased tendency to be involved in physical fights than non-athletes. (Endresen and Olweus, 2005, Rutten et al., 2007).

Therefore, these simple examples show how the broad question still remains largely unanswered. What is the broad impact of sport participation and sport activities in a society?

* * *

Albeit a theoretical reasoning, the approach of this work is intrinsically empirical. A panel dataset have been constructed for the twenty Italian regions over the period 1997-2003. The paper can be ideally split into two macro-sections. In a first section, I try a theoretical deepening of sport participation. Sport participation is interpreted in the light of Kenneth Boulding's theory of social interactions. In particular it is interpreted as a good retaining a multiple nature which combines (i) exchange; (ii) coercion and (iii) integrative relationship. In a second section, the impact of sport participation on the rate of property crimes is estimated by means of a panel data for Italian regions. Eventually a summary of findings and a related discussion is presented.

The economic nature of Sport participation

Before analysing in depth the relationship between sport participation and crime, we need a punctual definition of sport in economic terms. Elsewhere I defined sport as: «*a joint indivisible good, which is produced and consumed contextually by different agents. It retains a multiple nature. In fact, it is a combination of : (i) a market leisure good, (ii) a relational good and (iii) an expression of power and coercion*», see Caruso (2008b).

* * *

There is no need to explain the dimension of sport as market leisure good and its by-products. This is domain of classical sport economics which has been expanding for latest recent years, and whose founding pillars are Rottenberg (1956) and Neale (1964). Comprehensive accounts are Fort and Quirk (1995), Szymanski (2003), Zimbalist (2003) and Andreff (2008) and an original interpretation in the light of theory of multisided markets is in Budzinski and Satzer (2008).

* * *

Instead, in order to define the 'relational component' of sport participation I do refer to a growing strand of economic literature which focuses on beneficial impact of **relational goods** in societal development. The concept of relational goods has been developed in Ulhaner (1989), Gui (2000), Bruni (2006a) and Bruni and Stanca (2006) among others. First, relational goods "*depend upon interactions among persons*" (Ulhaner 1989, p. 253) and are peculiar *intangible outputs of an affective and communicative nature* (Gui 2000) that are produced through social interactions. Relational goods present some main characteristics. They are *non rival*. According to Uhlener, "*Relational goods can only be enjoyed with some others*". Second, production and consumption of such goods cannot be disentangled. They must be contextual and simultaneous. It seems to be reasonable, when considering that relational goods emerge from the interaction between agents. The relational good it is nothing but the relation itself. It must be

produced and consumed contextually. Eventually, motivations of agents matter. Goodwill is important for their production.

Of course, trivial to say, a relational good cannot be anonymous in any case. It must emerge at a particular time and place. In fact, a relational good produced and consumed by agents A and B at a particular time and place necessarily does differ from a relational good produced by agents C and D in a different place or time. Suppose for simplicity that A=C and B=D. Even in this case, a relational good produced and consumed by A and B does differ from a similar good produced by A and B either in a different place or time. Take the example of a sport activity. If two friends, Ivan and Jacob, play tennis everyday, the relational good - 'tennis match' – takes a different shape everyday. The Monday match will be different from Tuesday match and so on. Needless to say, a match played by Ivan and Jacob will differ from a match played between John and Jimmy. This holds for most relational goods and is particularly true in the case of sport activities. In brief, a relational good is necessarily a *named* good in the spirit of Hahn (1971).

Eventually, the value of any relational good also depends upon the *fellow feeling* as expounded by Adam Smith in the Theory of Moral Sentiments, which is a feeling of sympathy based upon shared experiences. Hence, the expected value the relational good consumed will depend upon the individual traits and inclinations of agents involved. Motivations do matter. A good disposition increases the probability that agents can sustain cooperative environments. It appears to be that there is also an important linkage between relational goods and economic development through the channel of a superior trustworthiness in an economic system.

* * *

The third element refers to the presence of **coercion** in sport activities. In fact, in many cases, sport participation is by no means a pure expression of voluntary choice. It can involve threat, coercion, aggressive behaviour and extreme competition. In the eyes of the economist, these behaviours are intrinsically unproductive or even destructive. To explain this point, historical examples are more effective. In fact, Soviet Union does constitute a good example in this respect. In fact, since the end of World War II, the East European (and world communist) sports system has been dominated by clubs of the security forces and armed forces. Most sports heroes, therefore, have officially been soldiers or police officers, guardians of public order and role models for a disciplined, obedient and patriotic citizenry. Thus, to many people, sport, has been identified in the popular consciousness with paramilitary coercion (Riordan, 1993). Sport participation was an element of a broader mechanism designed to fully control the society (Howell, 1975, Cooper, 1989). Moreover, sport system was also interpreted as ancillary to foreign policy. In fact, success in sport has aided USSR, East Germany, Cuba and other socialist countries to gain international recognition and prestige (Riordan, 1974). Nowadays, this phenomenon is pervasive in many autocracies. However, unfortunately there are some examples of sporting clubs directly managed by security forces even in the western democracies. However, such intertwining

between sports and military dates back to past ages. As noted above, in medieval societies, sport was considered the peacetime occupation of the nobles whose main business was represented by war (Carter, 1985). In sum, sport participation was not presented as enjoyment or leisure but it would descend from warring attitudes of men.

* * *

The multiple dimension of sport participation can be interpreted following and enriching the theoretical approach expounded by British economist Kenneth Boulding (see. Boulding, 1963, 1973, 1978). To Boulding, the social system can be divided into three large, overlapping and interacting sub-systems: (i) exchange, (ii) threat and (iii) integrative system. All human institutions and relationships involve different combinations of all three. All three organizers are necessary for society to flourish. In a nutshell, the modern economy is dominated by exchange whereas a bounded threat system is asked to support the legal order necessary for social stability. Third, the economy also depends on integrative relationships. For example, trust and honesty are needed for the development of the financial system. Hence, all three components coexist. For sake of formal simplicity, let a, b, c denote respectively the intensity of threat, exchange and integration. In particular, we can easily assume that $a \geq 0, b \geq 0, c > 0$, under the constraint $a + b + c = 1$.

Exchange relationships constitute the usual domain of economics. In its simplest form, two parties agree to exchange something with something else, usually money with goods and services. It is commonly understood as a positive sum game in which parties can be better off after the exchange is concluded. However, it still retains co-operative and competitive elements.

The **threat system**, in its simplest form, is also a relationship between two parties and one party is capable to affect the other party behaviour through coercion. It is summarised in the statement: "*If you do not do something (or you do) I shall do something nasty to you*". In fact, by coercion, it is intended that behaviour shaped and influenced by the existence of a credible threat. A credible threat depends upon the potential exploitation of brutal force. Under a credible threat the choices of an agent are made under coercion. Even though agents have options to make a choice, this is not purely voluntary (see on this point Basu 2007). Economic activity is full of examples. It is common sense that an executive can threaten a worker of firing. The government threatens individuals of expropriation if they do not pay taxes, or a state can threaten a tariff retaliation if another state (or a group of states) does not comply with some obligations. The threat system is less productive than exchange systems simply because exchange of goods encourages the production of goods, whereas threat discourages the production of goods. In sum a threat system is intrinsically unproductive (destructive). At the same time, a threat system is unstable in the long run.

In the context of this work, I am much more interested in the theory of **integrative system**. Among individuals, an integrative relationship involves a complex spectrum of feelings, such as respect, love, affection and so on. It also involves other concepts emerging between individuals as well as organisations:

legitimacy, status, sense of identity, community etc. In its romantic view, an integrative relationship implies a ‘meeting of minds’ (Boulding 1963, p. 425). In general terms, an integrative system needs first an interdependence of utility functions of parties involved. Second, an integrative system can take shape only in the presence of unilateral transfers. Namely in the presence of interactions which do not imply an exchange between agents. The classical example to be produced is the gift-giving. In fact, the integrative system is directly linked with the very fabric of human sociality. Emergence of relational goods – as defined above – does fit perfectly with Boulding’s integrative system. More precisely, it can be sustained that emergence of relational take place in the context of an integrative system. Moreover, the emergence of relational goods within an integrative system reinforces the establishment and the compliance of social norms.

In our context, it is noteworthy a significant enrichment to the Boulding’s theory of integrative system, which can be appropriately provided. In spite of Boulding’s silence on this, in fact, an integrative system appears also to challenge the standard theory of rational individual choice. In fact, rational agents in the midst of an integrative relationship may act and make choices as they were members of a team. This is one interpretation I am drawing from Sugden (2000)². Following Sugden’s language, individuals may conceive of themselves as members of a group or team. Therefore, the decision-making problem implies a different *framing* of the problem. Namely, « [...] *the individual frames the problem not as ‘What should I do’, but as ‘What should **we**³ do?’ [...]*⁴». The author termed it *Team-directed reasoning*. Needless to say it represents a significant departure from the standard rational choice theory. Being formally, such a behaviour implies that there is an only one *team-directed utility* function « [...] *which assigns a **single** utility index [...] to be called ‘team-directed’ utility [...] to be interpreted as a representation of **team-directed preferences** over the relevant outcomes, [...]*⁵». In short, in the presence of *team preferences*, the representation of the relevant outcome is unique for interacting players. This simplifies the interdependence of utility functions as predicted by Boulding to define an integrative system. In Sugden’s team-directed reasoning the integrative interdependence reduces exactly to convergence of utility functions. Perhaps, this may occur whenever the intensity of integrative behaviours is sufficiently high. That is, whenever the integrative behaviours dominate both exchange and threat behaviours. Take the example of a family. A wife and her husband are supposed (or expected) to exhibit a team-directed reasoning. In such a case, the intensity of integrative of behaviours reaches the maximum level (love). A team-directed utility function takes shape and there is an only one representation of the relevant outcome. This is neither frivolous nor trivial because the intensity of integrative behaviour has significant implications on consumption, fertility choices and education of children. These represent classical problems studied by political

² For the purpose of this work, it is interesting to note that in developing the theory Sugden produces an example drawn from sports termed ‘*the footballers’ problem*’.

³ Emphasis in the original.

⁴ Sugden (2000), p.

⁵ Sugden (2000), p.192, emphasis in the original.

economy. In a nutshell, Sugden's team-directed reasoning may be interpreted as a special case of Boulding's integrative system.

In broader terms, this also recalls the idea of ecological rationality as expounded by Smith (2008). To cite punctually: « [...] *The behavior of an individual, a market, an institution, or other social system involving collectives of individuals is ecologically rational to the degree that it is adapted to the structure of its environment[...]*»⁶.

* * *

The multiple definition of sport participation envisioned here is one in which the shape of outcome depends on intensity of different elements. In developing the point, we assume that the integrative intensity of sport participation must be necessarily positive, whilst threat and exchange elements perhaps can also exhibit a null intensity. This leads to an enriched and revised definition of sport as: «*a joint indivisible good, which is produced and consumed contextually by different agents in a certain place and time. It retains a multiple nature. In fact, it is a combination of: (i) a market leisure good, (ii) a relational good and (iii) an expression of power and coercion. They differ in intensity, but differently from (i) and (iii) the relational component must be necessarily positive.*» Eventually, given such a definition we can also produce a conjecture:

CONJECTURE: *Sport may be beneficial for society as long as the relational behaviours dominate both the coercive and the exchange components.*

How such a conjecture might be defended? To do that we can refer to the growing literature about the impact of relational goods. As noted above, in fact, sport like other 'relational goods' is supposed to produce a positive externality which enters positively the utility function of individuals. Therefore, the overall benefit to society is commonly supposed to be positive. A well-known positive correlation between happiness of individuals and relational goods is commonly recognized. Becchetti et al. (2006) and Becchetti et al. (2008), show that relational goods have significant and positive effects on self-declared life satisfaction.

Data and Empirical Evidence

Henceforth, I try an empirical investigation on the association between sport participation and three types of crime: (i) property crime; (ii) violent crime; (iii) juvenile crime. Table 1 reports descriptive statistics of variables used. All data are extracted from Italian national statistical office (ISTAT). All figures are collected on regional basis. Italian administrative regions correspond to NUTS II- level divisions as coded in the European Union.

⁶ Smith (2008), p. 36.

TABLE 1 - DESCRIPTIVE STATISTICS (SOURCE: ISTAT, YEARS 1997-2003)

Variables (Logged)	Obs.	Mean	St. Dev.	Min	Max
Property Crime rates	140	4.02	0.181	3.22	4.33
Violent Crime	140	2.33	0.359	1.16	3.41
Juvenile Crime	140	0.96	0.305	0.095	1.67
Sport Participation	140	3.34	0.252	2.83	3.87
Unemployment	140	2.18	0.596	0.9	3.2
Unemployment (one year lagged)	140	2.23	0.569	0.9	3.2
GDP per capita	140	9.71	0.317	7.6	10.1
Literacy	140	4.22	0.103	3.92	4.42
Security	140	6.48	1.069	3.7	8
Social Protection	140	5.38	0.998	3.24	7.49

The results of this study are reported in tables 2,3 and 4 below. In table 2 the dependent variable is rate of property crime (logged). Property crimes are thefts, robberies and burglaries. In table 2, the main finding is that sport participation indeed significantly reduces the level of property crime. In table 3, the dependent variable is the rate of violent crime. The index of violent crime is computed as the rate of violent crime per ten thousands of inhabitants. Violent crimes are rapes, homicides, kidnappings, injuries and lesions. It is shown that sport participation is positively associated with violent crime. However, the evidence is only weakly significant. In table 4, the dependent variable is the rate of juvenile crime defined as the percentage of crimes committed by minors (<18 years old) on the total number of crimes. Sport participation is negatively associated with the level of juvenile crime.

In all tables, column 1 reports the simplest baseline model. The dependent variable is regressed only on the sport participation rate. At the same time, I investigate eight different specifications. In table 2 in all of them the association between property crime and sport participation is negative and highly significant. In table 3 the results show a positive association between violent crime and sport participation. In table 4, all further specifications confirm a negative association between sport participation and juvenile crime.

In all specifications, a very significant covariate is the lagged unemployment rate. There is an established literature which analysed the impact of unemployment on crime rates (see Britt, 1997 for a review). Criminologists and other social scientists have been often interested in the relationship between crime and economic development. In fact, unemployment is often considered as a proxy of general economic conditions. Of course, it is expected to capture the opportunity cost of committing crimes. Even GDP per capita is frequently assumed to be a measure of social well-being. However, it is widely acknowledged that the use of GDP (or alternatively GNP) as a measure of progress of nations is strongly criticised. In fact it can be misleading. First, GDP per capita may measure the aggregate economic activity and not the social well-being. Second, the GDP measures only the current economic activity but says

little about future economic scenario. By contrast, individuals take into account current as well as future conditions. This is particularly important when considering crime. In fact, as Campiglio (1990) pointed out, the rate of unemployment does capture the expected difference in returns between legal and illegal activities. The higher is the rate of unemployment the smaller is this difference. Therefore, the opportunity cost of committing crime is lower. There are several empirical studies either confirming or denying this point. Scorcu and Cellini (1998) shows how the long-term trend of property crimes is associated with unemployment in Italy over the period 1951-1994. The specification also follows the intuition expounded in Levitt (2001) which includes both current unemployment rate and lagged unemployment rates. Following this intuition, the choice of committing a crime does depend on both current and past income. Eventually, in table 1 lagged unemployment is significantly associated with crime rates in specification 2,3, 5, 6, and 7. In table 3, it seems to be negatively associated with violent crime but the association is weakly significant. In table 4, lagged unemployment is positively associated with juvenile crime. In particular, the association is more robust in the column 2 where the specification is more parsimonious. However, GDP per capita has been also included as covariate in all tables. It does not show any significant association with crime rates.

TABLE 2. RESULTS- SPORT PARTICIPATION AND CRIME IN ITALY 1997 -2003 –
DEPENDENT VARIABLE: INDEX OF PROPERTY CRIME

	(1) OLS fixed effects	(2) OLS fixed effects	(3) OLS fixed effects	(4) OLS fixed effects	(5) OLS fixed effects	(6) OLS fixed effects	(7) OLS fixed effects	(8) OLS fixed effects
Sport	-0,45* (0,10) [0,00]	-0,30* (0,05) [0,01]	-0,29* (0,11) [0,01]	-0,24** (0,11) [0,03]	-0,30* (0,11) [0,01]			-0,27** (0,12) [0,03]
GDP per capita					0,00 (0,04) [0,91]	0,01 (0,04) [0,84]		
(Sport x Literacy)						-0,05* (0,02) [0,01]		
(Sport x GDP per capita)							-0,01 (0,01) [0,18]	
Unemployment			0,01 (0,05) [0,84]					
Lagged Unemployment (t-1)		0,14* (0,11) [0,01]	0,13* (0,06) [0,05]		0,14* (0,05) [0,01]	0,12** (0,06) [0,04]	0,16* (0,05) [0,00]	0,01 (0,07) [0,90]
Literacy							-0,14 (0,18) [0,45]	0,13 (0,19) [0,51]
Security				0,45				

				(0,28)				
				[0,11]				
Social Protection				-0,43*				-0,37*
				(0,11)				(0,14)
				[0,00]				[0,01]
constant	5,53	4,7	4,68*	4,2*	4,7*	4,44*	4,62*	6,34*
	(0,33)	(0,44)	(0,45)	(1,62)	(0,53)	(0,48)	(0,78)	(0,95)
		[0,00]	[0,00]	[0,01]	[0,00]	[0,00]	[0,00]	[0,00]
Obs	140	140	140	140	140	140	140	140
Groups	20	20	20	20	20	20	20	20
R² within	0,15	0,2	0,2	0,25	0,20	0,2	0,18	0,24
R² between	0,36	0,3	0,3	0,16	0,29	0,25	0,21	0,57
R² overall	0,22	0,17	0,17	0,09	0,17	0,14	0,12	0,42

Note: standard errors in parenthesis. P-values in square brackets. Significant coefficients in bold.; * 1%, ** 5%, *** 10%.

Surprisingly, spending on security seems to be ineffective in all specifications. Namely, it seems that deterrence has no role whatsoever in preventing or reducing crime. However, this seems to confirm the results presented in Caruso (2009) for organised crime. In all tables, the association between types of crime and literacy is not conclusive. In table 2 and 3, there is no significant association between crime and literacy. Instead in table 4, the association between juvenile crime and sport participation is negative and highly significant. However, it is interesting to note that the interaction term between sport participation and literacy (sport × literacy) shows a significant negative association in all tables. This result somehow recalls the evidence proposed in Downward (2007) which highlights a strong interdependence between sport participation and education. Therefore, it seems that the degree of literacy reinforces the relational beneficial impact of sport participation. This might be an important point for policy formulation. Instead, there is no significant association between crime rate and the interaction term between sport participation and GDP per capita (sport × GDP per capita).

TABLE 3. RESULTS- SPORT PARTICIPATION AND VIOLENT CRIME IN ITALY 1997 -2003 –
DEPENDENT VARIABLE: INDEX OF VIOLENT CRIME

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
	fixed	fixed	fixed	fixed	fixed	fixed	fixed	fixed
	effects	effects	effects	effects	effects	effects	effects	effects
Sport	0,42*	0,27***	0,31***		0,30***		0,26	0,26
	(0,15)	(0,17)	(0,19)		(0,18)		(0,19)	(0,17)
	[0,00]	[0,11]	[0,10]		[0,10]		[0,18]	[0,13]
GDP per capita			-0,00		0,02	0,01		0,18
			(0,06)		(0,06)	(0,06)		(0,06)
			[0,99]		[0,78]	[0,83]		[0,75]
(Sport x Literacy)						0,06***		
						(0,03)		
						[0,08]		
(Sport x GDP per capita)				0,02***				

					(0,11)			
					[0,08]			
Lagged Unemployment (t-1)	-0,13***				-1,19***	-0,18***	-0,18***	-0,13***
	(0,08)				(0,11)	(0,11)	(0,11)	(0,08)
	[0,08]				[0,10]	[0,11]	[0,11]	[0,08]
Literacy		0,16					0,15	
		(0,27)					(0,30)	
		[0,58]					[0,61]	
Security		0,37	0,53	0,29	0,28	0,30		
		(0,41)	(0,39)	(0,46)	(0,23)	(0,45)		
		[0,36]	[0,17]	[0,52]	[0,27]	[0,51]		
Social Protection					-0,2	-0,25	-0,24	
					(0,22)	(0,23)	(0,24)	
					[0,37]	[0,27]	[0,31]	
constant	0,92	1,72	-1,79	-1,79	0,77	1,3	0,54	1,58**
	(0,5)	(0,67)	(2,47)	(2,44)	(2,96)	(2,91)	(3,00)	(0,81)
	[0,07]	[0,01]	[0,47]	[0,47]	[0,79]	[0,66]	[0,86]	[0,05]
Obs	140	140	140	140	140	140	140	140
Groups	20	20	20	20	20	20	20	20
R² within	0,06		0,08		0,10	0,10	0,10	0,09
R² between	0,00		0,39		0,04	0,00	0,01	0,04
R² overall	0,00		0,35		0,04	0,00	0,01	0,02

Note: standard errors in parenthesis. P-values in square brackets. Significant coefficients in bold.; * 1%, ** 5%, *** 10%.

TABLE 4. RESULTS- SPORT PARTICIPATION AND VIOLENT CRIME IN ITALY 1997 -2003 –
DEPENDENT VARIABLE: INDEX OF JUVENILE CRIME

	(1) OLS fixed effects	(2) OLS fixed effects	(3) OLS fixed effects	(4) OLS fixed effects	(5) OLS fixed effects	(6) OLS fixed effects	(7) OLS fixed effects	(8) OLS fixed effects
Sport	-0,81*	-0,5***	-0,8*	-0,8*				-0,16
	(0,25)	(0,29)	(0,26)	(0,27)				(0,32)
	[0,00]	[0,09]	[0,00]	[0,00]				[0,61]
GDP per capita			-0,04	-0,04	-0,03	-0,06		
			(0,10)	(0,10)	(0,10)	(0,10)		
			[0,71]	[0,71]	[0,78]	[0,52]		
(Sport x Literacy)					-0,18*	-0,13*		
					(0,45)	(0,05)		
					[0,00]	[0,02]		
(Sport x GDP per capita)							-0,02	
							(0,02)	
							[0,45]	
Lagged Unemployment (t-1)		0,27**				0,26***	0,23***	0,15
		(0,13)				(0,15)	(0,14)	(0,14)
		[0,03]				[0,08]	[0,10]	[0,28]

Literacy							-1,11*	-1,06*
							(0,45)	(0,46)
							[0,01]	[0,02]
Security				-0,06	0,35	0,85	0,95	
				(0,66)	(0,67)	(0,72)	(4,91)	
				[0,92]	[0,60]	[0,24]	[0,91]	
constant	3,67	2,00***	3,99*	4,35	1,45	-2,7	-0,53	5,67*
	(0,85)	(1,14)	(1,21)	(4,2)	(4,2)	(4,8)	(4,91)	(1,94)
	[0,00]	[0,08]	[0,00]	[0,30]	[0,73]	[0,57]	[0,91]	[0,00]
Obs	140	140	140	140	140	140	140	140
Groups	20	20	20	20	20	20	20	20
R² within	0,08	0,11		0,08	0,13	0,15	0,16	0,15
R² between	0,52	0,39		0,49	0,08	0,03	0,01	0,12
R² overall	0,22	0,16		0,21	0,03	0,01	0,00	0,02

Note: standard errors in parenthesis. P-values in square brackets. Significant coefficients in bold.; * 1%, ** 5%, *** 10%.

To summarise the main results about the relationship between crime and sport participation it is possible to write:

- (1) there is a robust negative association between sport participation and property crime;
- (2) There is a robust negative association between sport participation and juvenile crime;
- (3) There is a positive association between sport participation and violent crime. However, it only weakly significant at 10%.

About the association with other covariates, it is noteworthy that:

- (4) There is a positive association between the interaction term between sport participation and literacy (sport × literacy) and crime rates. The association is robust in the case of property crime and juvenile crime. In the case of violent crime the association is only weakly significant.
- (5) There is a robust positive association between unemployment and property crime.

Concluding Remarks

The results of this work shed new light on the relationship between crime and sport participation. The idea that sport participation can have a role in reducing social deviances as crime seems to be confirmed. However, needless to say, stating that sport participation is not detrimental for society is not equivalent to saying that sport participation is surely beneficial for society. Therefore, to study the impact of sport participation on societal and individual well-being the analysis must be necessarily further deepened.

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