

# **The Effects of the Current Economic Conditions on Sport Participation**

**Chris Gratton and Themis Kokolakakis**

Sport Industry Research Centre  
Sheffield Hallam University  
A118 Collegiate Hall  
Sheffield  
S10 2BP

Tel: +44 (0) 114 225 5921  
Fax: +44 (0) 114 225 4341  
Email [c.gratton@shu.ac.uk](mailto:c.gratton@shu.ac.uk)  
http:// [www.shu.ac.uk/research/sirc](http://www.shu.ac.uk/research/sirc)



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## 1. Introduction

The period from the third quarter of 1992 to the first quarter of 2008 was the longest period of uninterrupted growth in the UK economy since the Second World War and one of the longest in UK history. After 16 years of continuous growth from 1992 to 2007 the economy declined by 1.1% in 2008 and by a further 4.4% in 2009. Although apparently recovering in 2010 with a growth rate of 2.1%, growth was very weak in 2011 at 0.8%. With a decline of 0.3% in the last quarter of 2011, and a further decline of 0.3% in the first quarter of 2012, the economy was officially in recession again. Sport England is interested in the answer to the question: what effect are the current economic conditions having on sport participation in England? This paper attempts to answer this question and compares the current economic situation with the last two recessions in 1980-81 and 1990-92.

## 2. The current economic conditions and comparisons with 1980-1981 and 1990-1992

Comparisons can be made with previous recessions in the past 30 years, in particular with the recessions of 1980-81 and 1990-1992. Table 1 below, shows the values of GDP (volume) and its growth, during the periods 1979-1983, 1989-1993, and 2007-11.

**Table 1: GDP change 1979-1983; 1989-1993; 2007-2011<sup>i</sup>**

	<b>GDP (volume)</b>
	<b>% change</b>
1979	2.7
1980	-2.1
1981	-1.3
1982	2.1
1983	3.6
1989	2.3
1990	0.8
1991	-1.4
1992	0.2
1993	2.2
2007	3.5
2008	-1.1
2009	-4.4
2010	2.1
2011	0.8

Source: Office of National Statistics<sup>ii</sup>

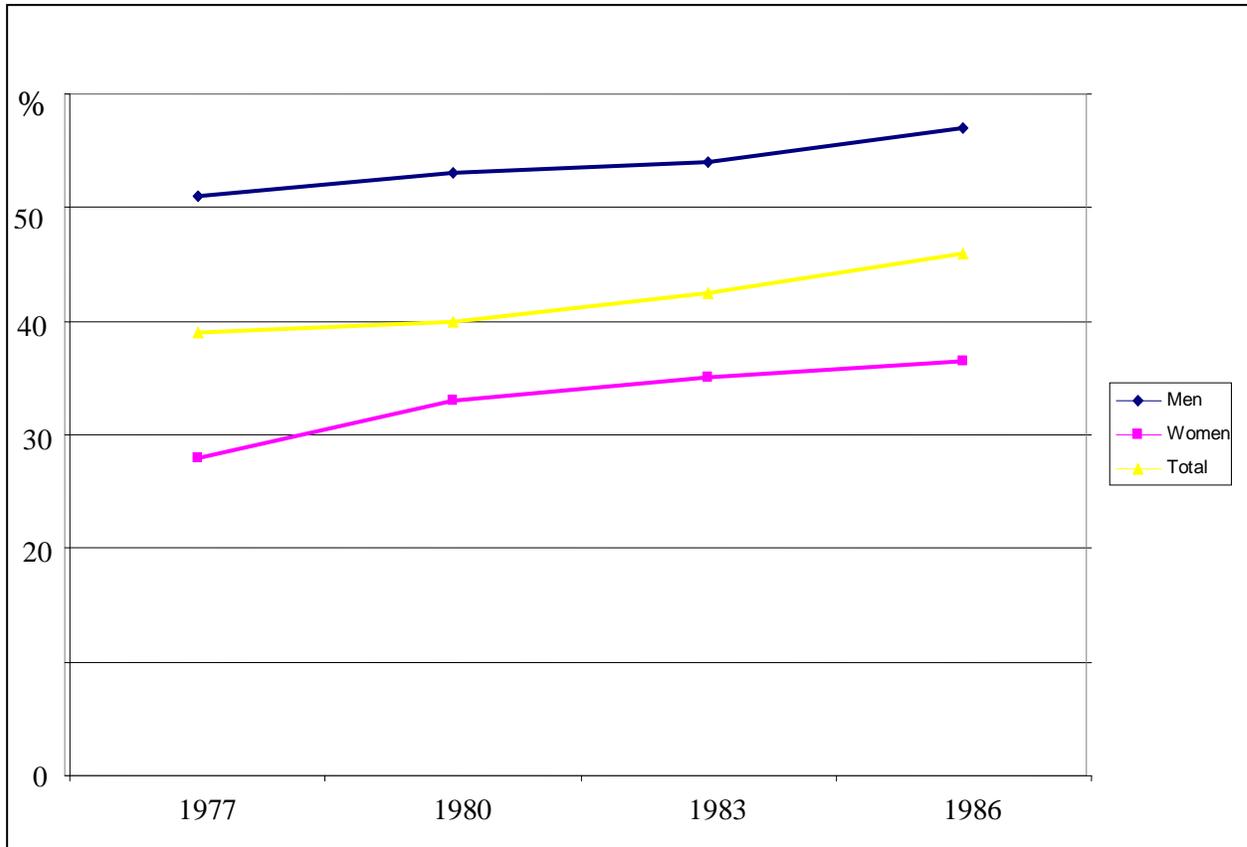
In the 1980-81 recession, the economy went from a growth rate of 2.7 % in 1979 to a decline of -2.1 % in 1980. The recession lasted two years; a further decrease of 1.3% occurred in 1981 but after that, the economy was back on track with GDP growing at 2.1% in 1982 and 3.6% by 1983.

In 1990-92 period, the recession started in the middle of 1990. There was a smoother decline of growth rates from 2.3% in 1989 to 0.8 %, in 1990 before declining for one year by -1.4% in 1991. The economy recovered from recession gradually with a marginal 0.2% growth in 1992, before growth closer to the long term trend returned in 1993, when GDP increased by 2.2%.

The current economic conditions are different from the past primarily because of the severity of the decline. The drop in GDP of 1.1% in 2008 was similar in magnitude to the drop in 1991, but the decline of 4.4% in GDP in 2009 was the largest drop in output in any one year since the 1930s. The drop was so large that even in 2012 GDP has not yet reached its 2007 level. A second difference is that in the early 1980s and 1990s, once the economy started to grow it soon got back to its long-term growth trend. This still has not happened by 2012 so the period of this economic turmoil is substantially longer than the previous two recessions, with the publication of the 2012 first quarter growth figures confirming a double dip recession. Overall, we are experiencing in the UK probably the most difficult economic conditions in post-war history. Not only have we not seen the economy return to its long-term growth path since 2008 but also over this period most people's real incomes have been in serious decline. Since 2009 most people have experienced small or non-existent rises in earnings while inflation has been well above 3%. Since these conditions are unprecedented in the post-war period their effects are difficult to predict since we do not have a similar period to compare it to. However, it is useful to look back to the previous two recessions in terms of what happened to sports participation.

## Effects of previous recessions on sport participation

**Figure 1: Proportion of adults (16+) participating in at least one sports activity in the four weeks before interview, GB 1977-86**



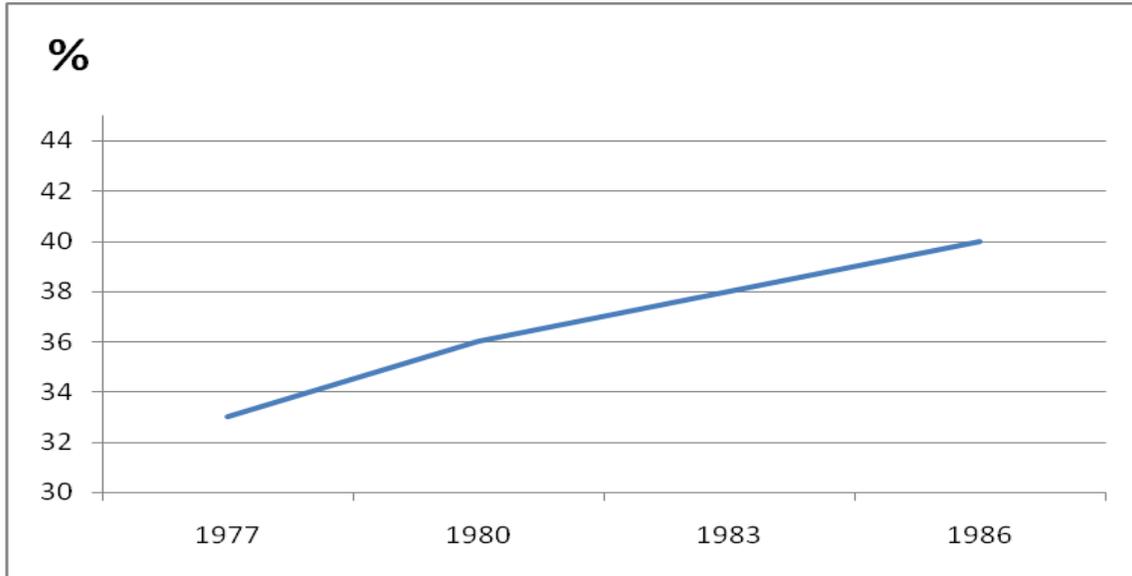
**Source: General Household Surveys 1977, 1980, 1983, 1986.**

Figure 1 shows that sport participation<sup>iii</sup> grew strongly for both men and women from 1977 to 1980 (up 4% for men and 16% for women). Although growth slowed between 1980 and 1983 (up 2% for men and 6% for women) there was no fall in participation as a result of the 1980-81 recession. It is possible that sports participation declined in 1981 and/or 1982 and then recovered by 1983. However, since the GHS data were only collected in 1980 and 1983, there is no way of knowing this with any certainty.

In fact, the Figure 1 data from the General Household Surveys for those years perhaps masks the real strength of the growth since the data includes participation in darts, billiards and snooker, and camping and caravanning. Since darts declined from a 15% participation rate in 1977 to 9% in 1986 this distorts the growth rate in overall participation. If we exclude these activities, we get the picture of Figure 2 below, which shows the strongest growth to be between 1977 and 1980, when it grew by 9.3%, but

there is no evidence of any decline in participation in the 1980-83 period, when it continued to grow with a growth rate of 5% over this period.

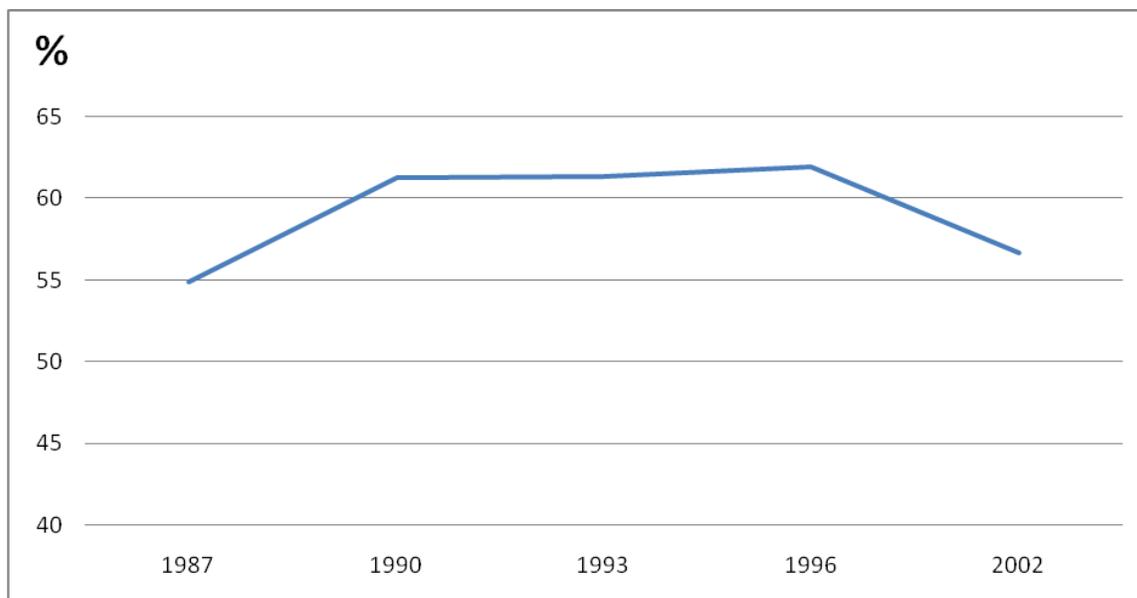
**Figure 2: Proportion of adults (16+) participating in at least one sports activity in the four weeks before interview, GB 1977-86**



**Source: Gratton and Tice (1989)<sup>iv</sup>**

Figure 3 below, shows the corresponding graph for 1987-2002. According to Figure 3, the strongest growth in participation is the 1987-1990 period and there is no evidence of decline in participation in the 1990-93 period. However, the recession took place in 1991 and we have no sport participation data for 1991 and 1992. As before, it is possible that sports participation did decline in this period but recovered together with the economy in 1993. What Figure 3 also shows is a decline in participation in the 1996-2002 years, despite the continuous strong growth in the economy over this period.

**Figure 3: Sports participation rates, Great Britain, 1987-2002**  
percentage of adults (16+) participating in the four weeks before interview (GHS)



**Source: General Household Surveys 1987, 1990, 1993, 1996, and 2002**

The existence of Active People Survey (APS) data for the 2005/6 period and then continuously from October 2007 means that for the first time we have sports participation data covering the whole period of an economic crisis and also for the period prior to the crisis. This data allows more sophisticated modelling to measure the impact of the economic crisis on sports participation.

### **3. Methodology**

The methodology involves the following two approaches:

- a) the estimation of a statistical time series model that will examine the relationship between participation in sport and macro economic factors such as GDP and unemployment. This is a time series analysis with the dependent variable being sport participation measured at the quarterly level from the fourth quarter of 2005 to the third quarter of 2011.
- b) a running cross-sectional analysis, year by year from 2005/6 to 2010/11, of the changing relationship over time between participation in sport (as measured by the APS) and various socio-demographic variables to see, for example, if socio-economic group, income, working status, education etc have become more or less influential as explanatory factors over time. The econometric<sup>v</sup> models used (logit) are the standard ones used in sports participation modeling as reviewed by Gratton and Taylor

(2000)<sup>vi</sup> and Downward (2007)<sup>vii</sup>. The analysis will compare parameter value changes and odds ratios as each annual model is estimated.

#### 4. Results

##### (a) *Time series model*

For the time series modelling several different specifications of the relationship between sports participation and macroeconomic indicators were attempted. The macroeconomic indicators used as independent variables were the level of GDP, changes in the level of GDP, the level of unemployment and changes in the level of unemployment. For each of these variables both current values and lags in the values were used. The best performing of the quarterly time series models was:

$$P(t) = 21.44 + \frac{0.27}{(0.06)} \text{ \%Change in GDP (t-3)}$$
$$R^2 = 0.53$$

where  $P(t)$  is the level of sports participation in period  $t$ . Participation is taken from the KPI1 index in the APS (moderate intensity sports participation at least 3 times a week, including moderate intensity walking and recreational cycling).

This model suggests that a drop (rise) in GDP causes a drop (rise) in sports participation three quarters later. A one per cent drop in quarterly GDP causes the percentage participation rate to drop 0.27 per cent three quarters later. Both sports participation and GDP have a strong seasonal component. In the case of sports participation the peak time is the summer quarter from July to September. The equation above shows that a decline in GDP does not necessarily imply a decline in sports participation in the short term. Other factors such as more free time may have a positive effect on the final outcome. It takes three quarters for an economic change to work its long-term effect on sports participation. Although this relationship works with GDP change, no significant relationship was found between sports participation and unemployment or change in unemployment (using time series data).

After a long period in which the economy was growing consistently, it is only in the most recent period that we can measure the impact of negative economic growth on sports participation. This has proved to have a significant negative effect on participation. The policy target for sport participation in England was an increase of one million more adults playing sport three times a week by 2013, as a result of hosting the Olympics in London in 2012. Active People Survey results to October 2011 provide a clear indication that the increase of one million will not be achieved. The results of this study indicate that the reason for the lack of achievement may be partly attributable to the economic conditions rather than to lack of inspirational influence of the Olympics or effective delivery. The

subsequent strategy for the 2012-2017 period has no numerical participation target but an ambition for year on year growth in sports participation.

**b) *Running cross-section regression models***

The model used in the running cross section regressions is based on the one developed for Sport England in May 2007. In all the logit regressions in Table 2 reported below the dependent variable is sports participation as measured each year by the KPI1 indicator in the Active People Surveys. Independent variables included gender, age, level of education, occupational status (such as professional, semi-skilled), unemployment, retirement and people who are not working but looking after house/children. In the table, we provide for each APS, the estimated coefficient (B), the associated standard error (S.E.), the odds ratios (for each significant variable) and the associated 95% confidence interval.

**Table 2: Running logit cross-section regressions**

	APS 1 2005/6					APS 2 2007/8				
	B	S.E.	Odds ratio Exp(B)	95% CI for odds ratio		B	S.E.	Odds ratio Exp(B)	95% CI for odds ratio	
				Lower	Upper				Lower	Upper
Male	0.242	0.009	1.273	1.251	1.296	0.265	0.012	1.304	1.272	1.336
Age: 25 to 34	-0.293	0.015	0.746	0.724	0.769	-0.348	0.022	0.706	0.677	0.737
Age: 35 to 44	-0.420	0.015	0.657	0.638	0.676	-0.454	0.022	0.635	0.609	0.663
Age: 45 to 54	-0.665	0.016	0.514	0.498	0.531	-0.590	0.022	0.554	0.531	0.579
Age: 55 to 64	-0.903	0.019	0.405	0.391	0.420	-0.917	0.026	0.400	0.380	0.420
Age: 65 to 74	-1.266	0.029	0.282	0.267	0.298	-1.236	0.038	0.291	0.270	0.313
Age: 75 plus	-2.127	0.034	0.119	0.112	0.127	-2.234	0.047	0.107	0.098	0.117
Education: No qualification	-0.580	0.017	0.560	0.542	0.579	-0.556	0.021	0.573	0.55	0.598
Education: Lower	-0.218	0.012	0.804	0.786	0.823	-0.328	0.017	0.720	0.697	0.745
Education: Medium	-0.074	0.011	0.928	0.908	0.949	-0.163	0.016	0.850	0.824	0.876
Professional										
Skilled, Non-Manual	-0.248	0.013	0.781	0.761	0.800	-0.182	0.018	0.833	0.805	0.863
Skilled, Manual	-0.339	0.013	0.712	0.694	0.731	-0.251	0.018	0.778	0.751	0.806
Partly Skilled/ Unskilled	-0.440	0.015	0.644	0.625	0.663	-0.388	0.021	0.679	0.651	0.707
Long term Unemployed	-0.710	0.024	0.492	0.469	0.515	-0.679	0.036	0.507	0.473	0.545
Student: full-time	-0.046	0.019	0.955	0.920	0.992	-0.080	0.026	0.923	0.876	0.972
Retired	0.110	0.022	1.116	1.069	1.165	0.131	0.029	1.140	1.078	1.207
Housework-children	-0.130	0.023	0.878	0.840	0.918	-0.069	0.031	0.934	0.879	0.992
Constant	-0.481	0.016	0.618			-0.466	0.023	0.628		

	APS 3 2008/9					APS 4 2009/10				
	B	S.E.	Odds ratio Exp(B)	95% CI for odds ratio		B	S.E.	Odds ratio Exp(B)	95% CI for odds ratio	
				Lower	Upper				Lower	Upper
Male	0.202	0.013	1.224	1.194	1.254	0.265	0.012	1.304	1.272	1.336
Age: 25 to 34	-0.376	0.027	0.687	0.651	0.725	-0.414	0.022	0.661	0.633	0.690
Age: 35 to 44	-0.416	0.026	0.660	0.627	0.694	-0.448	0.022	0.639	0.611	0.668
Age: 45 to 54	-0.583	0.027	0.558	0.530	0.588	-0.583	0.022	0.558	0.534	0.583
Age: 55 to 64	-0.908	0.029	0.403	0.381	0.427	-0.962	0.026	0.382	0.363	0.402
Age: 65 to 74	-1.257	0.036	0.285	0.265	0.306	-1.347	0.039	0.260	0.241	0.281
Age: 75 plus	-2.304	0.048	0.100	0.091	0.110	-2.307	0.048	0.100	0.091	0.109
Education: No qualification	-0.680	0.023	0.507	0.484	0.530	-0.586	0.024	0.557	0.531	0.583
Education: Lower	-0.334	0.017	0.716	0.693	0.741	-0.271	0.017	0.763	0.737	0.789
Education: Medium	-0.141	0.015	0.868	0.843	0.895	-0.072	0.015	0.931	0.903	0.960
Professional										
Skilled, Non-Manual	-0.156	0.017	0.856	0.828	0.885	-0.215	0.018	0.806	0.778	0.835
Skilled, Manual	-0.248	0.018	0.780	0.753	0.808	-0.234	0.018	0.791	0.763	0.820
Partly Skilled/ Unskilled	-0.403	0.022	0.668	0.640	0.698	-0.393	0.021	0.675	0.648	0.704
Long term Unemployed	-0.636	0.042	0.529	0.488	0.575	-0.638	0.035	0.529	0.493	0.566
Student: full-time	-0.104	0.035	0.902	0.842	0.966	-0.213	0.027	0.808	0.766	0.851
Retired	0.126	0.024	1.134	1.081	1.189	0.205	0.029	1.228	1.159	1.300
Housework-children						-0.085	0.032	0.919	0.862	0.979
Constant	-0.408	0.027	0.665			-0.454	0.023	0.635		

	APS 5 2010/11				
	B	S.E.	Odds ratio Exp(B)	95% CI for odds ratio	
				Lower	Upper
Male	0.318	0.014	1.375	1.339	1.412
Age: 25 to 34	-0.383	0.024	0.682	0.650	0.715
Age: 35 to 44	-0.483	0.025	0.617	0.588	0.647
Age: 45 to 54	-0.612	0.025	0.542	0.517	0.569
Age: 55 to 64	-0.984	0.027	0.374	0.354	0.394
Age: 65 to 74	-1.239	0.045	0.290	0.265	0.316
Age: 75 plus	-2.196	0.056	0.111	0.100	0.124
Education: No qualification	-0.573	0.028	0.564	0.534	0.595
Education: Lower	-0.250	0.019	0.779	0.750	0.809
Education: Medium	-0.047	0.017	0.954	0.923	0.986
Professional	0.109	0.030	1.115	1.051	1.182
Skilled, Non-Manual	-0.156	0.020	0.855	0.823	0.889
Skilled, Manual	-0.332	0.020	0.717	0.690	0.746
Partly Skilled/ Unskilled	-0.627	0.030	0.534	0.504	0.566
Long term Unemployed	-0.739	0.037	0.478	0.444	0.514
Student: full-time	-0.177	0.030	0.838	0.789	0.889
Retired	0.110	0.036	1.116	1.040	1.197
Housework-children	-0.089	0.043	0.915	0.841	0.995
Constant	-0.494	0.025	0.610		

*Red colour cells refer to non-significant variables at both 5% and 10% levels.*

### ***Interpretation of odds ratios***

All the regression models above are calculated using Binary Logistic Regression in SPSS. The general form of the estimated logistic function is:

$$\ln\left(\frac{p}{1-p}\right) = \beta X + \varepsilon \quad (1)$$

where  $p$  is the probability of participation while  $\beta$  and  $X$  are vectors with 19 elements (including the constant) and  $\varepsilon$  is an error term. Since  $p$  is the probability to participate in sport,  $(1 - p)$  is the probability of not participating. The ratio  $p/(1 - p)$  give the odds of taking part in sport, and effectively it becomes, in a natural logarithmic form, the left hand side variable in the regression. Consequently, the meaning of the male coefficient 0.318 in APS5 implies that as we switch from a female to a male (i.e. gender value increases by one) the log of the odds to participate increases by 0.318.

To proceed to the reported odds ratios note that equation (1) can be transformed by using the base e of the natural logarithms as:

$$p/(1 - p) = \text{Exp}(\beta X + \varepsilon) = \text{Exp}(\beta X) * \text{Exp}(\varepsilon) \quad (2)$$

$\text{Exp}(b) = e^b$  where e is the base of a natural logarithm. The reported odds ratios for the right hand side variables are of the form  $\text{Exp}(\beta)$ . Consequently the gender related odds ratio in APS5 is  $e^{0.318} = 1.375$ . This means that a switch from female to male (i.e. gender value increases by one) the odds to participate increase by a factor of 1.375.

### ***Interpretation of results***

To interpret the results it is necessary to look at the change in the odds ratio over the 2005/6 (APS1) to 2010/11 (APS5) period. A rise in the odds ratio implies that the probability of taking part has increased. The most significant changes in the odds ratio are discussed below.

#### ***Gender***

For Gender the base category used is female (associated with the value zero). According to the odds ratios the prominence of men in sports participation declined in the Oct 2008 to Sept 2009 period. One possible explanation is the fact that a greater proportion of men are active in the labour market and hence were most affected by the recession. However, it is surprising that at the end of the period, when technically out of recession, the relative male sports participation strengthened (odds ratio 1.38 in 2010/11 compared to 1.27 in 2005/06). Hence, overall there is a considerable increase in gender inequality without knowing the specific mechanism that brought this about. Males are more likely to take

part in sport in 2011 than in 2005, although the probability of male sport participation did decline during the recession.

### *Age*

Here the base category is 16-24. In each year, the expected hierarchy of the odds ratios is observed (i.e. for a single year odds ratios decline as people become older). The age category 25-34 had a declining position (relatively to the base) up to the period 2009/10. In the last year, we observed a small recovery. The age group 35-44 declined in relative participation terms in the period from the first to the fifth survey but not as significantly as the 25-34 category. The age category 45-54 actually becomes more pronounced in participation terms during the recession and it overall follows an increasing trend (in relation to the base), with a small decline at APS5. The 55-64 age group has a stable position for three years, then in 2009/10 there is a decline which continues in 2010/11. The age group 65-74 has generally a stable odds ratio at 0.28-0.29; its position declined in 2009/10 before recovering to its original position in 2010/11. The oldest group (75 +) had an odds ratio of around 0.1 throughout the period. Overall, the recession increased the age impact on sports participation, in particular for the 25-34 and 55-64 age groups, who were less likely to participate in sport at the end of the period than at the beginning. In contrast, the oldest age groups were largely unaffected.

### *Education*

Here the base category is having a higher degree. In each year the odds ratios hierarchically are as expected, as education increases, the odds ratios rise. The no-qualification category is generally stable with odds ratios at 0.56 to 0.57. It recorded its minimum value (0.51) at the start of the recession 2008/09. Both lower (GCSE) and medium (A-Level) categories generally show no effect connected to the recession. Their relative participations declined after the first year, but generally have been recovering ever since. Overall, there does not seem to be an education-related effect related to the recession. In other words, education as a positive factor boosting sports participation was not compromised during the recession.

### *Occupation*

Here the base category is Managerial. The Professional group had an insignificant effect throughout (red line in the Table 2), until the year 2010/11. As predicted, when the professional effect is significant it has a positive effect on participation. In the group Skilled Manual there was a decline since the 2008/09 survey: this started at the time of the recession. The Partial Skilled group had overall its associated odds ratio reduced from 0.64 in 2005/6 to 0.53 in the 2010/11 survey. This entire decline happened in the last year. Finally, students show a declining position starting from a 0.94 odds ratio in 2005/6 and to 0.84 in 2010/11 with the lowest value recorded in 2009/10. Overall, the changes to the occupational coefficients are considerable: recession had a real impact in the relationship between occupational categories and sports participation. The implication is that the Professional and Managerial groups are more likely to take part in sport in

2010/11 than in 2005/6 compared to other occupational categories whose probability of taking part in sport has declined over the period.

### ***Unemployment***

The base, against which unemployment is measured, is Managerial Occupations, as above since it is part of the occupation variable. As expected the unemployment coefficient is negative in each year. However, over time we see that the odds ratios associated with unemployment increases from 0.492 in 2005/6 to 0.529 in 2008/9 and 2009/10 and then drops to 0.48 in 2010/11. Although the changes in the odds ratio over the period are quite small it is lower in 2010/11 than in 2005/6 meaning the unemployed are less likely to take part in sport.

### ***Retired***

Here the base category is being economically active. The retired people have a positive effect compared to the economically active. Their participation in relative terms is exactly the same in 2010/11 as in 2005/06. However, it increased in importance in the 2009/10 period. In other words, the positive influence of the retired group on sports participation increased following the recession (relatively to the economically active). The retired have always had one important advantage over the economically active in relation to their probability of taking part in sport: they have more free time. However, over the 2009 to 2011 period they also have an added advantage: their incomes are generally linked to inflation whereas most people have seen real incomes decline over this period with rises in income not matching the level of inflation.

## **5. Participation in expensive sports**

If economic factors are important in influencing the level of sport participation then it is likely to be most evident in those sports that require high expenditure in order to participate. Table 3 below, shows the level of participation<sup>viii</sup> in skiing, golf and sailing in the most popular month from 2006 to 2011. In all three sports participation peaked in 2008. Lehman Brothers went bankrupt in September 2008 and that is generally regarded as the point of realisation of the seriousness of the global economic crisis. These peaks in participation all occurred before that point: in February 2008 for skiing, in July 2008 for golf, and in August 2008 for sailing.

**Table 3: Percentage monthly participation rates (most popular month) for skiing, golf, sailing, jogging and road running**

	<i>skiing</i>	<i>golf</i>	<i>sailing</i>	<i>jogging</i>	<i>road running</i>
	<i>(February)</i>	<i>(July)</i>	<i>(August)</i>	<i>(peak)</i>	<i>(peak)</i>
<i>2006</i>	1.029	4.518	0.576	1.314	2.827
<i>2008</i>	1.039	4.701	0.928	1.583	3.474
<i>2009</i>	0.779	4.025	0.504	1.418	3.278
<i>2010</i>	0.786	4.118	0.622	1.657	4.824
<i>2011</i>	0.621	3.846	0.567	1.543	5.236

**Source:** Active People Survey 2005/6-2010/11

After September 2008, participation in skiing and sailing dropped dramatically so that the 2011 participation rate was only 60% of the 2008 peak. Golf participation dropped less but even there the 2011 participation was only 80% of the 2008 level. Over this period, many golf clubs have abolished joining fees for new members and many clubs that formerly had waiting lists for new members no longer have such lists, indicating the drop off in demand<sup>ix</sup>.

There is clear evidence here that for expensive sports the economic recession has resulted in a clear reduction in demand.

This is emphasised by comparing it with relatively cheap sports such as jogging and road running. The peak months for these sports varies from one survey to another but is always between May and July. The table shows the month with the highest participation. In both these sports there is a small drop in participation from 2008 to 2009 but the level of participation in 2010 is substantially above the 2008 level, in contrast to what happened in golf, sailing and skiing. In the case of road running this growth continued into 2011 whereas there was a small drop in participation in jogging from the 2010 level.

## 7. Forecasts

**Table 4: Forecast participation 2011-2015**

	<b>GDP VOLUME</b>	<b>KPI1</b>
2004 Q3		
2004 Q4	344826	
2005 Q1	335364	
2005 Q2	331533	
2005 Q3	343440	
2005 Q4	355422	19.30
2006 Q1	347529	20.77
2006 Q2	339713	22.17
2006 Q3	349377	22.40
2007 Q4	376073	20.19
2008 Q1	368496	21.10
2008 Q2	347196	21.45
2008 Q3	359019	22.52
2008 Q4	359154	19.66
2009 Q1	343212	20.63
2009 Q2	330005	22.79
2009 Q3	343202	23.46
2009 Q4	354744	20.80
2010 Q1	346736	20.91
2010 Q2	338719	23.04
2010 Q3	352905	22.68
2010 Q4	361489	19.05
2011 Q1	346372	21.59
2011 Q2	347307	23.00
2011 Q3	352420	22.81
2011 Q4	362916	20.33
2012 Q1	352499	21.51
2012 Q2	343047	21.83
2012 Q3	353876	22.23
2012 Q4	363820	20.68
2013 Q1	358492	20.73
2013 Q2	348879	22.27

2013 Q3	359892	22.18
2013 Q4	370005	21.05
2014 Q1	366379	20.73
2014 Q2	356554	22.27
2014 Q3	367809	22.18
2014 Q4	378144	21.18
2015 Q1	375171	20.73
2015 Q2	365111	22.27
2015 Q3	376636	22.18
2015 Q4	387220	21.23

The forecasts above are based on the quarterly time-series model reported in section 4. GDP, in constant prices (volume) is taken directly from ONS<sup>x</sup> and it is not seasonally adjusted to correspond to the nature of sports participation rates. GDP was forecast firstly on annual basis. The following percentage rates of growth were used:

2012	0.3%
2013	1.7%
2014	2.2%
2015	2.4%

The GDP forecasts above are based on HM Treasury's 'Forecasts for the UK economy' (15/2/2012). The annual GDP figures were translated into quarterly data, given the GDP history from 2005 Q4 onwards. Finally, the regression model was applied on the forecast values of GDP to give us the highlighted values of sports participation.

The peak in GDP occurred in Q4 2007. The forecasts indicate that it will take until Q4 2014 before GDP rises above that level. Because of the lag between GDP change and change in sports participation the peak in sports participation occurred in the third quarter of 2009 at 23.46% on the KPI1 indicator (as recorded in APS3). The sharp drops in GDP in early 2009 did not start to affect sports participation until late 2009/early 2010. However, sports participation did not meet this peak level again in either APS4 or APS5. Table 4 shows that given the slow forecast rate of recovery in GDP, the peak level of sports participation achieved in 2009 is forecast not to have been reached again even by the end of 2015.

## 7. Conclusions

Previous evidence from the 1980s and 1990s suggested that economic recessions do not have a significant effect on sports participation. This paper has indicated that clear statistical evidence exists that the current difficult economic situation, which began in 2008 and still continues, has had a statistically significant effect on the level of sports participation. A significant regression model, estimated from 2005 to 2011 shows that reductions in GDP lower sports participation after a lag of three quarters. This model has been used to predict sports participation up to 2015.

The cross section regressions showed that the group not affected at all by the economic conditions in sports participation terms were the retired, which is as expected since this is the group the economic crisis has had least impact on. Finally, by looking at expensive sports it has been shown that these have had quite substantial drops in participation during the period compared to activities that require little expenditure to participate.

After a long period in which the economy was growing consistently, it is only in the most recent period that we can measure the impact of negative growth in the economy on sports participation. This has proved to have a significant negative effect on participation. The policy target for sport participation in England was an increase of one million more adults taking part in sport at least three times a week by 2013, as a result of hosting the Olympics in London in 2012. Active People Survey results to October 2011 provide a clear indication that the increase of one million will not be achieved. The results of this study indicate that the reason for the lack of achievement may be partly attributable to the economic conditions rather than to lack of inspirational influence of the Olympics or effective delivery. The subsequent strategy for the 2012-2017 period has no numerical participation target but an ambition for year on year growth in sports participation. The results in this report suggest that the return of strong positive growth in the economy would be needed to substantially improve the chances of this target being met.

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<sup>i</sup> GDP (Volume) refers to real GDP after adjusting for inflation. The changes are changes from the previous year.

<sup>ii</sup> <http://www.ons.gov.uk/ons/rel/naa1-rd/united-kingdom-economic-accounts/q4-2011/tsd-united-kingdom-economic-accounts-q4-2011.html>

<sup>iii</sup> Sport participation here is defined as taking part in sport at least once in the last four weeks.

<sup>iv</sup> Gratton C and Tice A (1994), Trends in sports participation in Britain: 1977-1987, *Leisure Studies* 13, 49-66.

<sup>v</sup> econometrics is statistical analysis in economic models

<sup>vi</sup> Gratton C and Taylor P (2000), *Economics of Sport and Recreation*, Taylor and Francis: Oxon.

<sup>vii</sup> Downward P M (2007), Exploring the economic choice to participate in sport: results from the 2002 General Household Survey, *The International Review of Applied Economics*, 21 (5), 633-653.

<sup>viii</sup> Participation here is defined as taking part at least once in the last four weeks

<sup>ix</sup> Daily Telegraph, March 30<sup>th</sup> 2009.

<sup>x</sup> <http://www.ons.gov.uk/ons/rel/naa1-rd/united-kingdom-economic-accounts/q4-2011/tsd-united-kingdom-economic-accounts-q4-2011.html>