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Autor:	Moschetti, Karine
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The Determinants of Sport Participation in Switzerland

Karine Moschetti*

1 Introduction

In recent years, sport has become a matter of great importance and has emerged as a beneficial factor in the social and economic development of nations. Sport participation has a variety of beneficial effects at both individual and societal levels (Bouchard, 1994; Curtis & Russell, 1997; Quinney et al., 1994). It is well demonstrated that sport contributes to personal development (see Schwery, 2003 for references). Besides physical well being and improving health, sport participation helps on developing skills, competencies and personal attributes, eventually allowing the individual to benefit from and contribute to the life of the community in which he lives (Henry, 2005). More recent analysis suggests that sport participation has a role in reducing social deviances such as crime (Caruso, 2009).

The beneficial values associated with sport participation make it a tool that is increasingly used by public authorities in order to improve the social and health status of the population. At the societal level, sport reduces inequalities between individuals in the community. Several studies suggest that more egalitarian societies are healthier because of their social cohesion (Wilkinson, 1996) and that they have faster economic growth (Glyn and Miliband, 1994). At the international level, the United Nations declared “sport has a crucial role to play in the efforts of the United Nations to improve the lives of people around the world” (United Nations, 2008). Within Europe, the White Paper on sport (2007) states that “Sport is a growing social and economic phenomenon which makes an important contribution to the European Union’s strategic objectives of solidarity and prosperity”. In Switzerland several initiatives also show that the authorities have placed great emphasis on the societal role of sport in particular in promoting health and social integration¹.

* Institute of Health Economics and Management (IEMS), University of Lausanne and CHUV.

1 The national program “La Suisse bouge”, from the federal statistical office of sport (OFSPO) aims at promoting health through the organization of sporting activities for all segment of the population in a maximum of towns. The program, initiated in 2005, defined “health as one of the first priorities of the national sport policy and more physically active people as its main objective”. The 2000 report “The federal concept for a sport policy in Switzerland” clearly points out that the social cohesion may be enhanced through sport in Switzerland. More recently, the federal project Moving toward Integration supported by the Swiss Academy for Development (SAD) and the Swiss Federal Institute of Sports Magglingen (SFISM) aims at promoting social integration of young people from immigrant backgrounds by facilitating their access to organized sporting activities.

It is thus a widespread idea that sport may have the capacity to transform and even improve communities. However, stating that sport participation is not detrimental for society is not equivalent to saying that sport participation is absolutely beneficial for society. A large body of literature in sociology of sport, concerned with social differentiation and social inequality, argued that the opportunity to participate in sports is associated primarily with social stratification (Bourdieu, 1991; Gruneau, 1975, 1981; Loy, 1969; Scheerder et al., 2002, 2005). A lower social class background may be a barrier to access and active participation in sport. According to Bourdieu (1979), sport participation is not a matter of individual preference but depends upon the financial resources available to the potential participant, the social class of those prominent in that activity, and the cultural meaning and the individual's relationship to those meanings. From this perspective, sporting styles are driven by social class and sport is therefore a reflection and reproduction of the social inequalities in a society (Donnelly, 1996).

In this context, a better understanding of the trends, levels and especially the determinants of sport participation may be the first step towards the development of more sport-based effective programmes. Studies focusing on sports and factors related to participation show that 1) the total number of people that participate in sports can be increased and 2) an equitable population participation in sporting activities within and across nations has not been achieved yet (WHO, 2003; Eurobarometer, 2004). Sport can be beneficial for society only on the condition that a large proportion of the people participates. However, European figures on sport participation in 25 member states², show that on average, 40% of the population did not participate in exercise or sports in 2004. Large variations in the proportion of non participation exist across European Union members, ranging from 5% for Finland to 66% for Portugal (Eurobarometer, 2004). Evidence also shows that disparities by sociocultural characteristics (gender, age, income, education level, ethnicity ...) in sport participation exist (Collins 2003; Sugden & Tomlinson, 2000). With regards to the Swiss situation, the proportion of people that is totally inactive is almost 30% (Lamprecht et al., 2008). In 2000 and 2008 surveys of sport participation in Switzerland provide a clear overview on sport participation. The determinants of sport participation across the country are also well illustrated. Both surveys reveal that disparities in sport participation persist over time by age, but also by education levels, occupation and income. However, comparison between the 2000 and 2008 surveys, suggests that disparities by gender decreased and even blurred over time (Lamprecht et al., 2008).

Although these findings are interesting and contribute to a better understanding of the factors related to sport participation, one main criticism has to be addressed. These studies focus on specific determinants using a descriptive approach and standard statistical tools. However, more powerful results can be obtained by estimating ad-

2 Switzerland is not included in the study.

hoc models of sport participation which simultaneously consider many explanatory factors. In the existing literature, rare are the studies that tackle the topic using econometric tools. Using cross sectional 1997 data from a national health survey, Farrel and Shields (2002) examined the impact of economic and demographic factors on sporting participation in England. In order to take into account unobservable heterogeneity related to the household attitudes towards sport, the authors used random effects probit models to estimate the probability of participating in sporting activities. Humphreys and Ruseski (2006) developed an economic model based on the idea that participating in physical activity can be modelled by a two-step decision. Individuals first decide whether or not to participate in sports and then secondly determine how much time to allocate to sports. Based on this selectivity assumption, the authors used a Heckman model to investigate the economic determinants of sport participation in the United States for the year 2000. Using a less sophisticated model, Scheerder et al. (2005) examined the relationship between sport participation and the social back-ground from a time-trend perspective. The authors investigated the factors that play a significant role with respect to sport participation in Belgium by means of a logistic regression estimation.

The main purpose of this paper is to explore the factors that play a role in leisure-time sport participation in Switzerland, and to quantify their relative impact by means of a multivariate parametric approach. The analysis also serves to enlighten which factors may constitute barriers to sport participation and subsequently to identify the segments of the population that tend to be excluded from sports. To achieve this, a particular interest is given to demographic variables such as age, gender, family commitment, citizenship and also to socioeconomic variables such as education, occupation and income. How cultural aspects affect sport participation is also examined. The analysis is carried out with data from eight waves of the Swiss Household Panel (SHP) and modelled using a random effects probit model that takes into account various characteristics of the respondents.

The paper is organized as follows: section 2 presents the data and some descriptive statistics regarding sport participation in Switzerland. Section 3 details the econometric specification for the investigation of the determinants of sport participation. The estimation results are discussed in section 4. Finally, section 5 draws conclusions from the findings.

2 Characteristics of the study sample

In this paper, the data is drawn from the first eight waves (1999–2006) of the Swiss Household Panel, which include information on sport participation of the respondents as well as invaluable information on demographic, socioeconomic and occupational variables. The SHP is a longitudinal survey of private households in

Switzerland that is designed to observe social change and in particular, the dynamics of changing living conditions in the population of the country. Since its beginning in 1999, the survey has covered a wide range of topics and approaches in the social sciences³.

The study is based on an unbalanced and unweighted sample of respondents for whom information on all required variables is reported. The unit of the study sample is the individual. New entrants are not included in the sample that consists of 5,147 individuals, among which 1,368 have been in the panel for all the years. Overall, the sample is composed of 21,666 person-years. In this study, information on sport participation is collected through the original question: How frequently do you practise sport as a leisure activity? The ordinal answers range from never (coded 1), to everyday, (coded 5) where the intermediate answers are less than once a month (coded 2), at least once a month (coded 3) and at least once a week (coded 4).

Figures 1 to 6 present the descriptive statistics of sport participation by certain key demographic and socio-economic indicators. Let us review the statistical characteristics of the study sample in sequence.

Figure 1 displays the distributions of sport participation across all eight waves according to the frequency of participation. On average one fourth of the respondents does not practice any sport in Switzerland. These figures are in accordance with those reported by Lamprecht et al. (2008). In 2000 and 2008, the proportion of inactive people remains close to 27%. Even if the data are not exactly comparable, figures tend to show that the rate of inactive people in Switzerland is lower compared to the European average of 40%. Almost the majority of respondents – range from 48% to 60% over time – declared participating in sports at least once a week. This proportion is also higher than the European average of about 38% in 2004. Figure 1 suggests that there is an increasing proportion of people who engage in sport participation over the eight year period. The econometric specification will enable to identify whether or not this time effect is significant.

Figure 2 gives the distribution by gender and does not exhibit important differences between men and women. Surprisingly, this observation differs from numerous studies reporting substantial disparities in exercise by gender (Collin and Kay, 2003).

As expected and illustrated by figure 3, sport participation is differentiated by age classes. The proportion of people practising some sport every day or at least once a week decreases with age. Below 25, there are about 75% of the respondents who have a regular (at least once a week or everyday) sport activity and this number falls to 50% for those over 65. Moreover, figure 3 suggests that there is a polarizing effect of age on sport participation. On the one hand, the percentage of people that declared never to practise sports increases substantially among the age groups. Whereas only 13% of respondents aged below 25 do not practise sport, the pro-

3 For more detail information on the SHP see <http://www.swisspanel.ch>.

Figure 1: Sport participation by waves

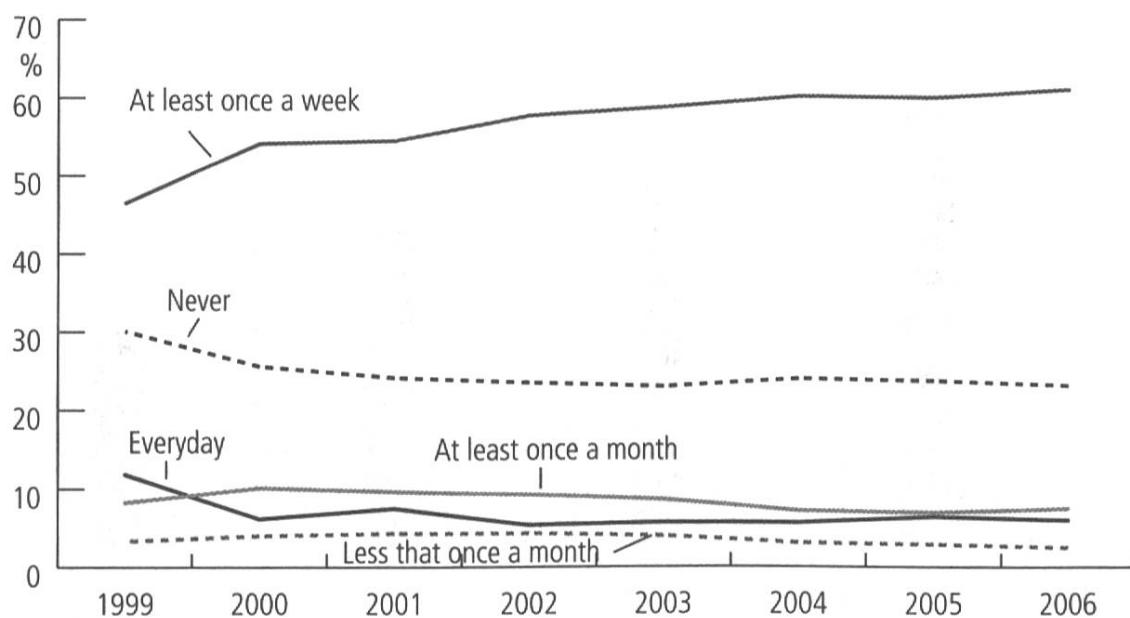
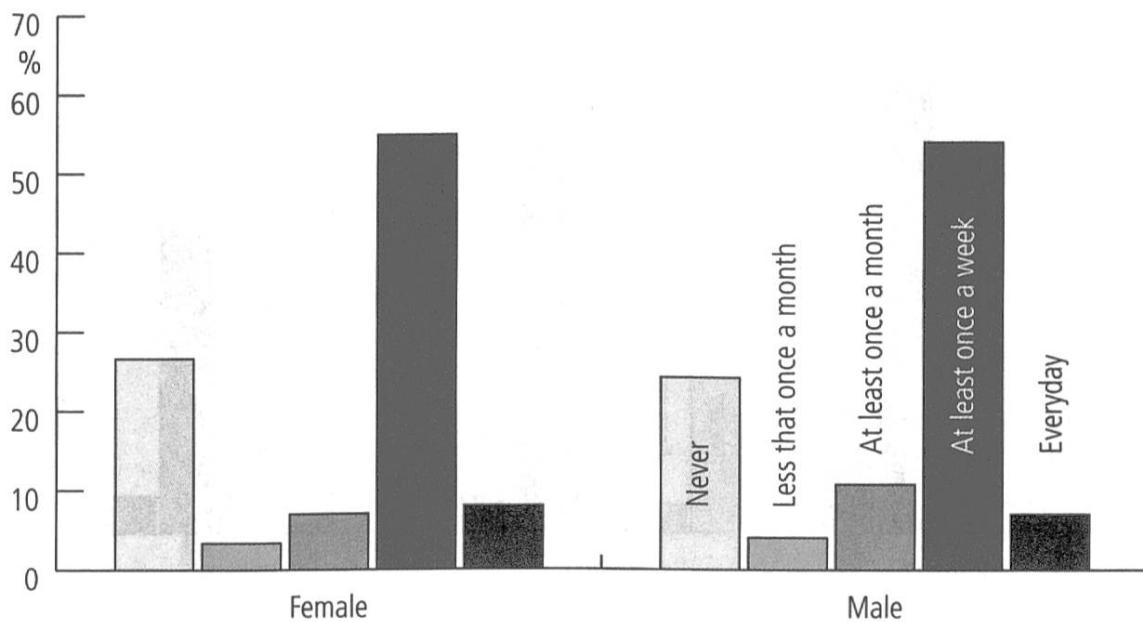


Figure 2: Sport participation by gender



portion is above 50% for people aged over 65. On the other hand, the proportion of people that has a daily sport participation is around 10% for the two first age classes and increases for the two following age classes. Almost 14% of people aged between 45 and 64 participate in sports everyday. This figure is about 16.5% for respondents over 65 years. Meanwhile, the proportion of people that participate at least once a week decreases strongly among the age groups. These observations suggest that over a certain age there are "two categories of people": those who do not

Figure 3: Sport participation by age group at first wave

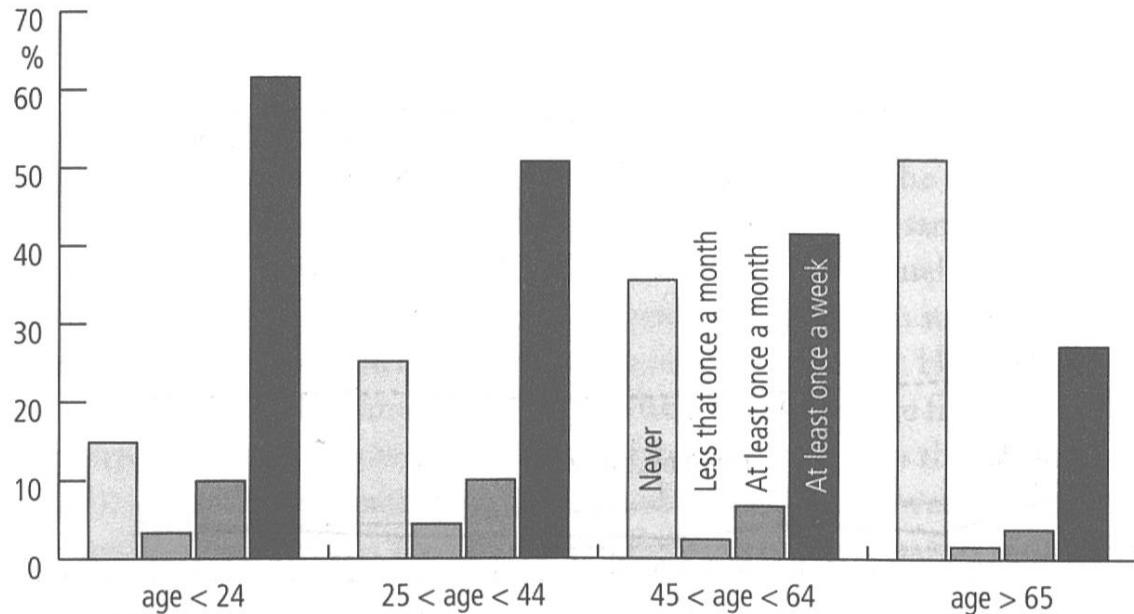
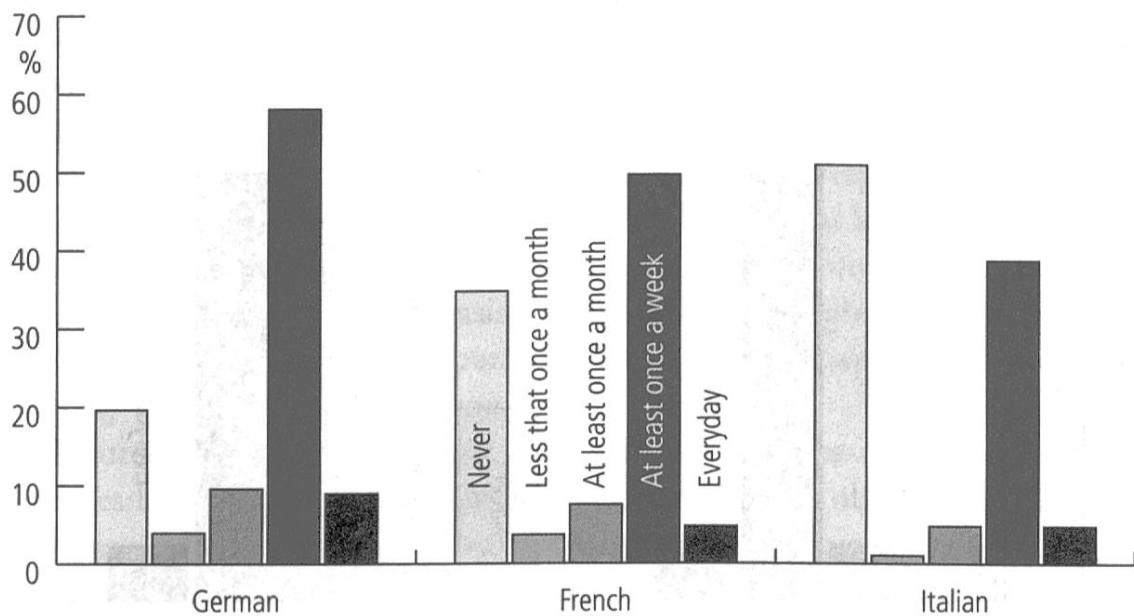


Figure 4: Sport participation by language of interview



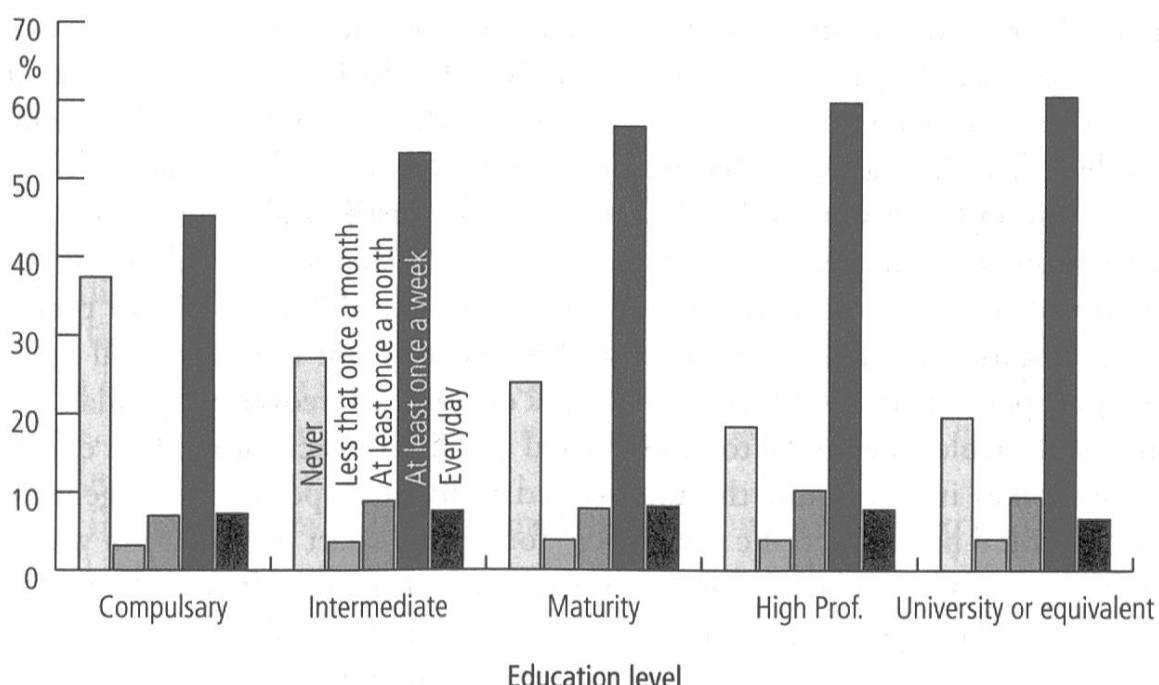
participate at all in sports and those who have a daily sport participation. This may be explained by two opposite effects. On the one hand retired people may have more free-time to allocate to sport participation. They may also be taking part to leisure activities because they enjoy the social side. Sport participation is thus a means to keep a social network after retirement. On the other hand, age is closely linked with health and a bad health status may prevent people from practising any sport.

As depicted by figure 4, cultural differences captured here by means of the interview language seem to play an important role in determining sport participation in Switzerland. Over the eight waves, more than two thirds (68%) of the German-speaking respondents declared to have a regular (at least once a week or everyday) sport activity against 57% for the French-speaking and 43% for the Italian-speaking respondents. The comparison between the proportion of non participation in sport for the four countries (Austria, Germany, France and Italy)⁴ surrounding Switzerland also shows interesting cultural similarities. The largest proportion of inactive people is observed in Italy (58%) followed by Germany (36%), France (35%) and Austria (34%). Similar patterns are observed when comparing linguistic regions within Switzerland. The highest rate of non participation in sport is attained by Italian speaking people (51%) and is the lowest for the German speaking respondents (20%).

Among the various facets of social exclusion, economic disadvantages constitute the basic forms of this exclusion. Looking at both relationships between sporting participation and education as well as between sporting participation and income is therefore particularly interesting.

Figure 5 indicates that the proportion of people practising sport varies substantially with the level of education. The proportion of people who said to have regular sport participation ranges from a minimum of 54.5% for people with the lowest education level to a maximum of 68.5% for respondents with the highest level. The proportion of respondents that declared never to practice sports is highest (37%) for the first quintile of income (the poorest) and lowest (16%) for the last

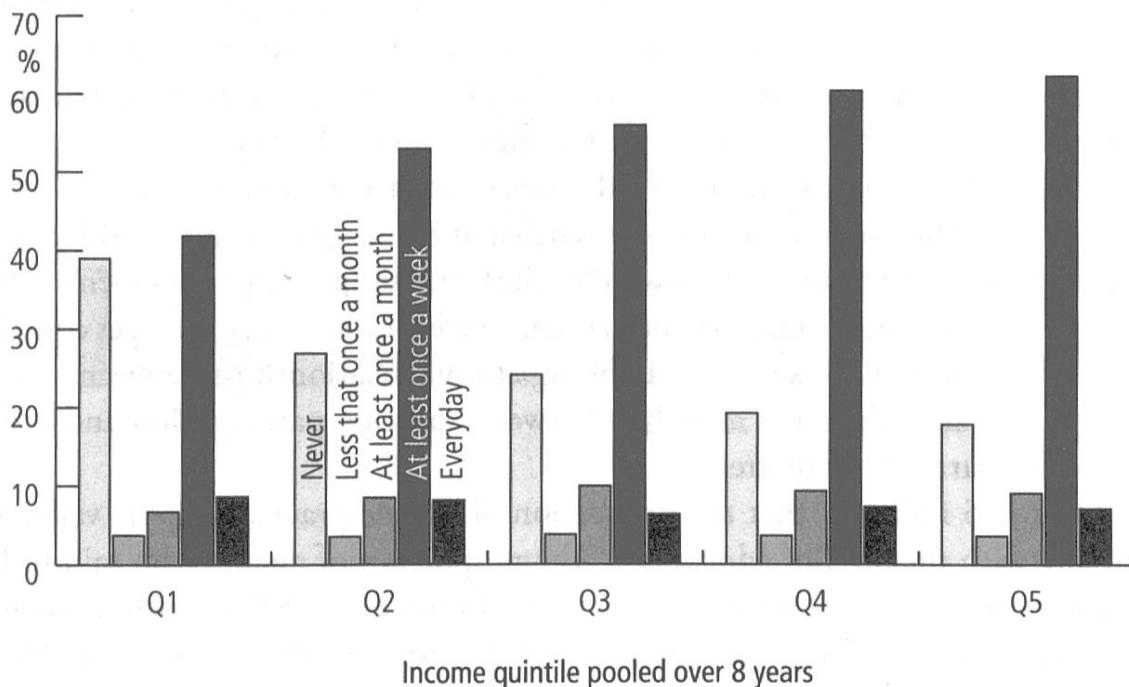
Figure 5: Sport participation by education level



4 European figures from the 2004 Special Eurobarometer are used.

quintile of income (the richest) suggesting that family income is a key factor for disparities in participation in sport (figure 6).

Figure 6: Sport participation by household income quintile



3 Econometric specification

From the 5 ordered responses of the original sport participation question, two groups of sport participation were further derived by distinguishing people that exercise at least once a week or everyday (answers coded 4 and 5) from those who practice less than once a week, that is, either never, less than once a month or at least once a month (answers coded 1, 2 and 3). The justification is based on the idea that, from a health perspective, regular sport participation is effective in the prevention of several chronic diseases (Warbuton et al., 2006). A binary probit model specification is then chosen to model whether or not the individual has a regular sport participation (at least once a week or not). Moreover, the availability of panel data enables the model to be estimated as a fixed-effects or random effects model that takes into account the unobserved individual-specific heterogeneity. Individuals could have a “specific preference” for regular sport participation which cannot be captured by socio-economic factors. Panel estimators often “differentiate out” this individual-specific heterogeneity while still allowing for it. To account for unobserved individual heterogeneity this analysis uses a random-effects probit model, which is outlined as follows.

An individual's decision regarding regular sport participation during period t is modelled by a continuous latent variable SP_{it}^* which represents the individuals underlying propensity to participation. It is given by:

$$SP_{it}^* = x_{it}\beta + u_{it} \text{ for individual } i=1,2, N; t=1.8 \\ \text{with } u_{it} = \alpha_i + \eta_{it}$$

$$\text{and } SP_{it} = \begin{cases} 0 & \text{if } SP_{it}^* \leq 0 \\ 1 & \text{if } SP_{it}^* > 0 \end{cases}$$

where SP_{it} is the binary observable response; x a vector of covariates affecting SP_{it}^* ; β is the estimated vector of coefficients; α_i is an individual specific and time invariant random element that captures the unobservable individual heterogeneity towards sport participation and uncorrelated with the covariates; η_{it} is a time and individual specific error term. The random effects specification imposes that $\eta_{it} \rightarrow i.i.d.N(0,1)$ and that the α_i s are independent random draws from a normal distribution, where $\alpha_i \rightarrow i.i.d.N(0, \sigma_\alpha^2)$. This implies that $Var(u_i) = 1 + \sigma_\alpha^2$. Furthermore, the common error component α_i means that, within individual, the u_{it} s are correlated and the magnitude of that correlation is constant given by

$$Corr(u_{it}, u_{is}) = \frac{\sigma_\alpha^2}{1 + \sigma_\alpha^2} \quad t \neq s.$$

The random-effects model incorporates the assumption that the x 's and the α_i are not correlated. However, this is a rather implausible assumption. An alternative would be to estimate a fixed-effects probit model which allows for correlation between the covariates and the individual effects. Unfortunately, there is no readily consistent estimator for a fixed effects probit model for T fixed (Greene, 2000). Another solution would be to estimate a fixed-effects logit model. However, the fixed-effects model has the drawback that time-invariable factors (e.g. sex, education and cultural aspects) cannot be included in the estimation. This would lead to the exclusion of important covariates. Therefore, a random-effects probit model as outlined above is estimated.

Given the assumptions, the probability of having a regular sport participation for an individual i at time t (SP_{it}), conditional on the regressors and the individual effects, is $\Pr(SP_{it} = 1 | x_{it}, u_{it}) = \Phi(x_{it}\beta + u_{it})$ where $\Phi(\cdot)$ is the standard normal cumulative distribution function.

In order to control for different factors that may affect sport participation, the model includes demographic covariates such as age, gender, number of children and whether or not there is at least one dependent child (i. e. under age 5) in the family. Family commitments may play a role in the probability of sport participation. Note, however, that the impact of children on adult sport participation may be

complex and bi-directional. As young children require considerable attention, this may limit the amount of time allocated to sport participation by adults. Conversely, the sport participation of children may constitute a driver for adult participation. This may be particularly verified for sports that are child-oriented (swimming, cycling...). Cultural aspects captured by the language of household questionnaire (French, German or Italian) are also taken into account in the model. Whether

Table 1: Variable notation and descriptive statistics

Variable	Description	Mean	Min	Max
Sport participation	Sport participation	0.621	0	1
Gender	1 if the respondent is male	0.452	0	1
Age	Age in years at the beginning of current wave	44.915	13	94
Child	1 if respondent is aged below 14, 0 otherwise	0.026	0	1
Nb of children per HH	Number of children in the household (HH)	0.836	0	6
Children aged below 5	1 if there is at least one child aged below 5 in the HH, 0 otherwise	0.124	0	1
Ethnicity and Culture				
Foreigner	1 if not Swiss, 0 otherwise	0.098	0	1
French	1 if language is French, 0 otherwise	0.284	0	1
Italian	1 if language is Italian, 0 otherwise	0.051	0	1
German	1 if language is German, 0 otherwise	0.664	0	1
Income				
Equivalent scale Income	OECD-modified equivalence scale yearly net income in thousands of CHF	58.500	0	1040
Education				
Compulsory	1 if highest education is compulsory school, 0 otherwise	0.125	0	1
Intermediate level	1 if highest education is at an intermediate level, 0 otherwise	0.419	0	1
Maturity	1 if highest education is at maturity level, 0 otherwise	0.176	0	1
High professional degree	1 if highest education is a high prof. degree, 0 otherwise	0.153	0	1
University degree	1 if highest education is a university degree, 0 otherwise	0.124	0	1
Occupation				
Full time employed	1 if working full time, 0 otherwise	0.419	0	1
Part time employed	1 if working part-time, 0 otherwise	0.232	0	1
Apprentice	1 if on apprenticeship, 0 otherwise	0.073	0	1
Homemaker	1 if a homemaker, 0 otherwise	0.110	0	1
Other occupation	1 if not working full or part time, not retired, not apprentice, not homemaker	0.022	0	1
Retired	1 if respondent is retired, 0 otherwise	0.141	0	1

or not respondents are foreigners is also examined. Lambrecht and Stamm (2005 and 2006) suggest that foreigners are less likely to participate to sporting activities. Investigating cultural differences in sport participation in Switzerland may be important to design appropriate policies promoting regular sporting participation in the community. Also, controlling for income and education enables us to understand to what extent these factors may constitute barriers to sport participation. In order to make a better comparison between standards of living of households with different members, I use the "OECD-modified equivalence scale to assign each household type in the population with a value in proportion to its needs. As suggested by Haagenars et al. (1994), I weighted each person of the household according to the following scale: 1 for the household head; 0.5 for each additional adult member; and 0.3 for each child. I then divided the household income by the total household weight. Finally, the occupation variables capture differences in the amount of leisure time that is available for sport. For instance, it is expected that unemployed, retired persons and people working part time may have more time to allocate to sport than those who are employed full time.

Table 1 gives a detailed description of all the variables used in the empirical estimation and summarizes some descriptive statistics.

The probit model is estimated using a random effects probit procedure which is available in Stata. For the random effect model, the likelihood function is calculated by adaptive Gauss-Hermine quadrature and by default computed by using 12 quadrature points. The proportion of variance due to individual effects is determined by the estimation routine.

4 Estimation results

Maximum likelihood estimates of the structural parameters of the random effect probit model are presented in table 2. Note that most of the estimates are significantly different from zero at even very small levels of significance. Moreover, the estimated parameters accord with their expected impact on sport participation in Switzerland.

The estimation shows that 60% of the latent error variance can be attributed to unobserved individual heterogeneity, as measured by the intra-class correlation coefficient (rho). When rho is zero, the panel-level variance component is not important and the panel estimator is the same as the pooled estimator. The likelihood-ratio test that formally compares the pooled estimator with the panel estimator confirms that the random effects probit model is better than the pooled probit model⁵. An

5 Using the initial categorical responses to sport participation, both random and pooled ordered probit models were estimated. The sign and significance of the estimated coefficients confirm the impact of parameters on sport participation obtained using the random effects probit model.

Table 2: Parameters estimates and average partial effects of the random effects probit model.

Variable	Coefficient	S. E.	Average partial effects
Demographic factors			
Gender	-0.053	(0.051)	-0.123
Age	0.007	(0.009)	0.002
Age squared	-0.025*	(0.010)	-0.006*
Children	0.314**	(0.113)	0.070**
Nb of children per HH	0.006	(0.021)	0.001
One child aged below 5	-0.363**	(0.052)	-0.085**
Ethnicity and Culture			
Foreigner	-0.331**	(0.070)	-0.078**
French	-0.519**	(0.050)	-0.123**
Italian	-0.827**	(0.103)	-0.198**
Income	0.002**	(0.001)	0.001**
Education			
Intermediate level	0.282**	(0.069)	0.064**
Maturity	0.401**	(0.076)	0.090**
High professional degree	0.559**	(0.086)	0.124**
University degree	0.684**	(0.091)	0.150**
Occupation			
Part time employed	0.152**	(0.053)	0.035**
Apprentice	0.307**	(0.093)	0.070**
Homemaker	0.030	(0.071)	0.007
Other occupation	0.145	(0.098)	0.033
Retired	0.089	(0.086)	0.020
Constant	0.440*	(0.209)	
N	21666		
Rho	0.601		
Log-likelihood	-11582.697		
χ^2 (df = 19)	513.203		

* Significance level: 5%

** Significance level: 1%

additional estimation including time dummies in the pooled regression model shows that there is no significant time effect on sport participation over the covered 8 years.

The interpretation of the estimated coefficients is restricted to a simple positive-negative effect: a positive sign indicates a higher probability of regular sport participation with the respective covariate while a negative sign indicates a decreasing probability.

The estimation results are point estimates and, thus are not directly usable for policy analysis. To provide an indication of the magnitude of the associations between

sport participation and the factors, average partial effects (APEs) are required. For continuous regressors, such as age and income, the APEs are obtained by taking the derivative of the probit probabilities with respect to the variable in question. For discrete variables, such as education level, they are obtained by taking differences. In both cases the partial effects are functions of x_{it} and the individual effect α_i . The partial effects are averaged over the population distribution of heterogeneity and computed using the population averaged parameters β_α . In the random effects specification these are given by

$$\beta_\alpha = \beta / \sqrt{1 + \sigma_u^2}.$$

Wooldridge (2005) shows that computing the partial effect at the observed values of the regressors for each observation and averaging the estimates over the observations provides a consistent estimate of the APE. Here the estimates are averaged across the eight waves of the panel as well as across individuals to give a single point estimate. The right column of table 2 summarizes the APEs on the determinants on the probability of regular sport participation.

4.1 Demographic variables

Unlike the conclusions previously derived by Farrel and Shields (2002) and Humphreys and Ruseski (2006), the gender coefficient does not show significant difference between men and women in the probability of regular sport participation in Switzerland. Note that this result is consistent with the previous annual report on Swiss sport participation which mentioned that differences between men and women has been decreasing since 2000 and is almost insignificant nowadays (Lamprecht et al. 2008). The recent development (last ten years) of indoor sports such as aerobics, fitness, dance and yoga, may have contributed to the growth of women's participation in sports. The proportion of women that practice such physical activities has reached 84% today (Lamprecht et al. 2008).

As indicated by the negative and significant coefficient of the variable age squared, age has a negative effect on the probability of having regular sport participation, all other things being equal. Progressive exclusion from sport in elderly people may be due to a certain decline in health status and mobility and an increase of isolation. Given all the benefits that may be derived from sport, maintaining a minimum level of practice for this group of people would be crucial. Children are more likely to have a regular sport participation (APE = 0.07).

In contrast to Humphreys and Ruseski (2006), the number of children in the household does not seem to affect the probability that an individual participates regularly in sport. However, having children aged below 5 limits the probability of regular sport participation by at least 0.08. Farrel and Shields (2002) also reported

a reduction of the probability of sport participation for respondents with dependent children compared to those with no children.

The descriptive statistics in section 2 suggested that cultural aspects also play a role in sport participation in Switzerland. After controlling other factors influencing sport participation, this finding is confirmed. Compared to German-speaking respondents, respondents with a Latin culture are less likely to practice sport at least once a week or every day. Indeed, having a French culture decreases the probability of sport participation ($APE = -0.12$) when compared to having a German culture. Similar patterns are observed with Italian culture. Since the language used for the interview is strongly correlated to linguistic regions in Switzerland, one may wonder whether the differences in sport participation between German, French and Italian speaking regions are not due to differences in the availability of sport and leisure facilities between these regions. Unfortunately, there is insufficient data to allow for useful comparison of sporting infrastructures between regions. After controlling other explanatory variables, foreigners are also found to be less likely to practice sport. This is consistent with studies showing that migrants are under-represented in both individual and team sports in the country.

4.2 Socioeconomic factors

The variables for educational achievement exhibit interesting patterns. The probability of having regular sport participation significantly increases with the level of education achieved. The omitted category is people who only completed the compulsory school. Those who completed the maturity level are more likely to participate regularly in physical activities compared to those who had an intermediate education. Professional graduates are more likely to participate than those who completed the maturity level, and people with a university degree are more likely to regularly participate in sports than those with professional degrees. One explanation can be that the higher your level of education, the higher your knowledge of and belief in the health benefits of sport participation. Consequently, there is a greater motivation which leads to increased participation in sport.

Results suggest that the income has a clear impact on the probability of regular sport participation. The significant and positive coefficient of income suggests that persons with higher income are more likely to regularly participate in sports than people with lower income. This provides some evidence that the income may act as a barrier to regular sport participation and that, if sport is to be used as a policy instrument to enhance social integration, then efforts have to be done to increase access to sporting activities.

Conditionally on income, controlling for individual occupations allows us to capture the effect related to the amount of time that individuals allocate to sport. Part time workers and retired people are more likely to regularly participate in sports than people who are employed full time ($APE = 0.03$ for part time working

and APE = 0.02 for retired). Note, however, that the coefficient for retirement is not significant in the model. Also, people still at school or in apprenticeship seem to have more time to allocate to sport than those employed either full or part time.

Comparing the results with previous international and national studies (Farrell and Shields, 2002; Lamprecht and Stamm, 2006), on the basis of different data sets and approaches, one is struck by some similarities of the impact of variables such as age, education, and income. Lamprecht and Stamm (2006) showed that differences in sport participation exist according to occupation, citizenship and cultural aspects in Switzerland. The present analysis also exhibits these differences. Whereas Farrell and Shields (2002) found that gender and the number of children within the household have both a significant and negative impact on the probability to engage in sport, these findings are not shown in the present analysis.

5 Conclusion

By showing social inequalities in a specific type of leisure activities in Switzerland, this analysis tackles an interesting topic related to social sciences and contributes to research in sociology. More precisely, the key contribution of this study is to provide a better understanding of the factors that determine sport participation in Switzerland. To enable this, a detailed statistical analysis that incorporates simultaneously numerous explanatory variables has been performed. Using data drawn from eight waves (1999–2006) of the Swiss Household Panel survey, a random effects probit model that includes demographic and socioeconomic factors is estimated. The relative impacts of the factors that determine sport participation were quantified by means of the calculation of the average partial effects. In accordance with the existing literature on sociology of sport, results indicate that involvement in sport as a leisure activity is associated with socio-cultural characteristics such as age, nationality, income, and education. Despite public sport policies, these results suggest that social inequalities are still prevalent with regard to leisure time participation in sporting activities (Vanreusel et al., 2002).

With respect to physical disability, mental illness and/or learning difficulties, several articles focus on how to encourage sport participation for these groups (see Collins et al., 1999). It would have been interesting to analyse to what extent people with disabilities may be socially excluded from sport. Although the SHP dataset includes some information on the health status of the respondents, no specific and detailed enough information regarding physical or mental disabilities is reported. The use of longitudinal data enables the study to take into account unobservable individual heterogeneity in the estimations and to examine trends over time both in terms of participation and attitudes. However, the loss of participants from one wave to another can result in bias of the results. Attrition of the original sample

represents one of the major threats to multiwave studies, and it can bias the sample (Miller and Hollist, 2007). Further investigations would enable us to test and correct for the potential attrition bias. Also, the sample design inherent in the SHP survey might bias the data. In order to compensate for the imperfections in the data sample, further work using weighted data in the analysis would need to be done. However, it is important to notice that results presented here show strong coherences with the 2008 report on Sport participation in Switzerland as well as with the analysis performed by Lamprecht and Stamm (2006) on the basis of data from the Swiss Health Surveys.

Despite these limitations, the study aims to improve the information available to public authorities concerned with sport as a means of potential benefits in community. The factors associated with sport engagement in Switzerland suggest that potential areas for promoting sport should rely on a differentiated sporting policy integrating 4 main aspects. By far the most critical of these is age. Sport participation decreases severely as people get older. Since the proportion of the elderly is growing and will continue to increase in the future, regional and local authorities should focus seriously on interventions facilitating the regular involvement of a greater number of elderly in sport activities. However, there are also inactive adults and young people. An effective intervention policy aiming to promote sport in the community should be adaptable to targeted age groups. Secondly interventions should also target at specific groups of the population such as foreigners and family with small children. The third aspect addresses the socioeconomic position. Although the democratisation of sport is undeniable, the effects of socioeconomic factors (education level and income) on the probability of regular sport participation in Switzerland underlines that some social markers remain. Policy aiming to increase sport participation should take into account this dimension. The last aspect is cultural. It is unlikely that differences in supply factors are the only explanation for the differences in sport participation between Swiss regions. Although programmes of sport development should put sufficient sporting infrastructures at disposal of the population, policy strategy should also focus on individual mentalities. If policy intervention is to enable people to become aware of the benefits of sports and consequently to generate a culture of sport, specific approaches for the different language regions of Switzerland would be required.

Since social benefits may be achieved by generating even modest participation levels among those who do not practice sports, the Swiss authorities should strategise sport promotion by paying more attention to these aspects.

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