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Book Part

Sports betting, sports bettors and sports gambling policy

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Brad R. Humphreys and Brian Soebbing

Sports Betting, Sports Bettors and Sports Gambling Polic

in:

**Sport und Sportgroßveranstaltungen in Europa –
zwischen Zentralstaat und Regionen**

Herausgegeben von Martin-Peter Büch, Wolfgang Maennig und
Hans-Jürgen Schulke

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Sports Betting, Sports Bettors and Sports Gambling Policy

Brad R. Humphreys and Brian Soebbing

Introduction

Gambling on sporting events occupies a curious position in the economy. Some form of legal sports betting exists in almost every part of the world, and anecdotal evidence indicates widespread informal betting on sports. Significant demand for sports betting among consumers clearly exists. While betting on informal athletic events like footraces could exist in the absence of organized sporting events, the existence of a large number of highly organized team sports leagues and individual sports associations enhances betting opportunities. Yet most professional and amateur sports organizations and associations actively oppose any form of betting on the events that they organize. For example, in the United States (US), the National Intercollegiate Athletic Association's (NCAA) official policy is to oppose all forms of legal and illegal betting on sports; the National Football League (NFL) formally opposed the recent legalization of sports betting in Delaware. Professional and amateur sports organizations typically cite the corrupting influence of sports betting on athletes and events when opposing sports betting. Consumers like to bet on sports, while sports leagues actively and vigorously oppose betting on their events.

Governments also hold divergent positions on sports betting. Legal sports betting exists in four US states: Nevada, Oregon, Montana and Delaware. However, the US government passed a law, the Professional and Amateur Sports Protection Act (PASPA), in 1992 that explicitly outlaws sports betting in all but these four states. Many other countries, in Europe and elsewhere, either allow sports betting or actively encourage sports betting by operating nationwide monopoly sports betting operations, often in conjunction with national lotteries. Some countries, like the United Kingdom (UK), have legalized sports betting markets with free entry of private sports betting companies that operate tradi-

tional bricks-and-mortar betting shops and on-line betting. In general, governments appear to trade off the negative aspects of sports betting and the revenues that can be gained by regulating and taxing this activity.

Several recent events related to the supply of sports betting opportunities motivate this paper. In 2005 the Oregon legislature voted to eliminate a long-running sports betting game, named Sports Action, operated by the Oregon Lottery. This sports betting game was quite profitable, earning about 12 million US-Dollars in its final year of operation, but was eliminated because of continuing pressure from the NCAA, which threatened to ban Oregon from hosting NCAA postseason events if it did not eliminate this game. In June 2009 the state of Delaware passed a law making sports betting legal in the state. Some form of sports betting, either Nevada-style bookmaking or an Oregon-style lottery-based sports betting game will soon be available in Delaware. Immediately following the legalization of sports betting in Delaware, the governor of neighbouring New Jersey announced an initiative to legalize sports betting in that state, citing the potential for sports betting in Delaware to reduce gambling revenues in New Jersey. In August 2009 the four major professional leagues in North America and the NCAA sued the state of Delaware to try and block the implementation of this law. In addition, the NCAA ratified a policy under which states who legalize betting on NCAA games will not have the opportunity to host NCAA championship events¹. Also in 2009, the state of Montana announced that it would expand its current NASCAR-based sports betting game to NFL games at the start of the upcoming football season. In Europe, the European Union (EU) has been taking aggressive actions to eliminate state-run monopoly sports betting operations in EU countries in order to open up domestic sports betting to more competition. This change opens up the possibility of legal internet sports betting as well as widespread sports bookmaking in all countries in the EU like what currently exists in the UK. France is already crafting new gambling regulations in response to EU rulings and the EU has sent requests for details on current gambling regulations to Germany and Sweden.

Finally, the growing availability of internet sports betting sites calls into question the ability of governments to regulate sports betting. The US passed a law making transactions between US financial institutions like banks and credit card companies and on-line gambling sites illegal. Following the passage

¹ See Associated Press (2009).

of this regulation, a number of prominent on-line gambling operators like Bwin and Sportingbet ceased commercial transactions with US customers. However, internet gambling continues to expand, especially in the EU, and there have been continuing calls for the repeal of this US law. As internet sports betting opportunities expand, it will be increasingly difficult to regulate sports betting around the world.

All these events affect sports bettors in some way. The current ban on sports betting in the US in all states except Nevada, Delaware, and Montana, has an impact on people who would like to bet on sports but cannot in the current regulatory environment. These bettors must travel to states where sports betting is legal, bet with an illegal bookmaker, or not bet on sports despite a desire to place such bets. This reduces the utility of sports bettors. In states with government-operated sports betting monopolies, sports bettors have limited betting options and often must pay high effective prices for bets. Since the ultimate cost of sports betting regulation falls on bettors, we examine the characteristics of sports bettors in two countries, Canada and the UK, where sport betting is legal and widely available. We focus on these two countries because surveys of sports bettors have recently been conducted there, we have access to these surveys, and the questions asked in these surveys are relatively comparable. This allows us to develop evidence about sports bettors in these two countries and compare the characteristics of sports bettors across the countries. We also discuss the current availability of sports betting in the US and the EU and develop some evidence about the characteristics of US sports bettors. Improved understanding of the characteristics of sports bettors will help policy makers understand the likely consequences of changes in existing sports betting regulations and enhance understanding of the costs and benefits of existing sports betting regulations.

The Availability of Legal Sports Betting

The availability of sports betting in any economy depends on both the regulations put in place by the government and the willingness of some individuals to violate these regulations. Simmons provides a thorough analysis of the factors that influence the amount of regulation placed on gambling opportunities. He further stresses the inherent tension between consumers who view gambling as entertainment and governments who view state-sponsored mo-

nopoly gambling industries as an important source of revenue as an important determinant of the amount of gambling available in an economy.²

Sauer explains the regulation and availability of gambling in the context of a public choice model.³ In this model, governments set regulations in response to lobbying by interest groups, and society contains a pro-gambling component whose welfare rises with gambling availability and falls with gambling regulation and an anti-gambling group which wants to restrict gambling opportunities. The anti-gambling group contains individuals and organizations like churches that dislike gambling for a number of reasons. In the case of sports betting, this group can also contain professional and amateur sports organizations like the NCAA. The gambling regulations that emerge from this model are a function of the relative effort that the two groups place on lobbying. Simmons points out that this model cannot be applied to settings where significant gambling opportunities already exist⁴.

Forrest and Simmons thoroughly analyse the economic and public policy context of sports betting. They document the rapid growth in sports betting and discuss the potential for this increase to generate revenues for both governments and sports organizations.⁵ Forrest and Simmons also discuss negative aspects of sports betting, including the incentives for corruption it generates. They emphasize the symbiotic nature of the relationship between sport and sports betting and point out the importance of complementarities between sport spectating and sports betting as well as the tensions generated by this symbiotic relationship.⁶ The importance of complementarities in consumption drives demand for sports betting and puts pressure on governments to expand sports betting opportunities while the corruptive factors fuel the desires of anti-sports gambling groups and leads to increased pressure to restrict sports betting opportunities.

All of the factors described above are at work to some extent in the three sports betting markets we examine in this paper. Clearly, the sports betting market in the US and the EU are in states of transition, with important increases and decreases in sports betting opportunities occurring frequently in both countries. Below, we describe the sports betting opportunities that exist

² See Simmons (2008).

³ See Sauer (2001).

⁴ See Simmons (2008).

⁵ See Forrest/Simmons (2003).

⁶ See *ibid.*

in the two countries we have detailed data on sports betting market participation for, Canada and the UK, and also describe the current sports betting opportunities in the US and the EU.

Sports Betting in Canada

Canadians can bet on sporting events through a group of lottery-based games referred to collectively as Sports Select. Sports Select includes a number of similar sports betting lottery games offered by groups of Canadian provinces. The games included under the Sports Select umbrella include Pari sportif, Pro-Line, and Sports Action. In some provinces in Western Canada, Point Spread, a lottery-based game featuring bets against point spreads is also offered. All of these sports lottery tickets can be purchased at lottery outlets across Canada. In some provinces, Sports Select tickets can be purchased on the Internet. The Sports Line games, with the exception of Point Spread, are all based on fixed-odds bets on outcomes and totals in professional and amateur sporting events, including games in the major North American sports leagues, US college football and basketball games, and Professional Golfers Association (PGA) tour tournaments. The Sports Select games are parlay games where bettors must pick the outcome of between two and twelve sports events.

Payouts in Sports Select are not pari-mutuel. Instead, the lottery corporations make profits based on overround, the amount by which the win probabilities implied by the fixed odds offered on specific outcomes exceed 100. The overround on Sports Select bets varies depending on the number of events selected. The minimum overround is 160 %, and it can be over 300 % depending on the exact set of events selected. Payouts are capped at 2,000,000 US-Dollars per card no matter how large the odds on the selected events.

Sports Betting in the United Kingdom

The UK has among the most developed sports betting markets in the world. Bookmaking is a legal, regulated industry in the UK and prominent private bookmakers like Ladbrokes and Betfred operate hundreds of betting shops across the UK where bettors can place fixed-odds bets on sporting events. Fixed-odds sports betting in the UK is not pari-mutuel and does not involve any takeout; UK bookmakers earn profits by setting betting odds such that an equal amount wagered on each possible outcome (a win, loss or tie in football games or a win or a loss in other sporting events) would result in a loss to the

bettor. Setting fixed odds in this way is called overround; the typical overround in fixed-odds betting on football games in the UK is about 10 %. UK book-makers also take bets on sporting events over the internet.

Football pool betting, a form of sports betting based on correctly forecasting the outcome in a number of football games, is also legal and very popular in the UK. A number of private companies, including Littlewoods and Vernons, operate football pools in the UK. Football pool operators take entries over the Internet.

Sports Betting in the United States

Currently, betting on individual sports events is only legal in the state of Nevada in the United States. Casinos in Atlantic City, New Jersey, are not permitted to operate sports books. Sports books in Nevada offer points spread and fixed-odds betting on all types of professional and amateur sporting events. The standard bet on a sporting event in Nevada follows a “wager 11 to win 10” format where a bettor must risk 110 US-Dollars to win 100 US-Dollars. The 10 & commission on these bets is often called the “vig” or “juice”. Anecdotal evidence suggests that quite a bit of illegal sports betting takes place in the US. Strumpf analysed the behaviour of several illegal sports book-makers in New York City⁷.

From 1987 until 2007, the Oregon Lottery operated Sports Action, an NFL sports betting lottery game similar to the Sports Select game offered in Canada and the La Quiniela game offered in Spain. Sports Action tickets could be purchased at Oregon Lottery outlets. Players could pick against the spread, on totals, or on other special events like the number of sacks or fumbles in a football game. A minimum of three games or special events had to be selected on each ticket, and a maximum of 14 could be selected. Players could wager between 2 US-Dollars and 20 US-Dollars. Payouts were pari-mutuel; the minimum payout for correctly picking 3 out of 3 games was 10 US-Dollars on a 2 US-Dollar ticket and 20 US-Dollars on a 20 US-Dollar ticket for correctly picking 4 out of 4 games. If there was no winner in a category (3 picks, 4 picks, et cetera), the dollars bet rolled over to the next week’s game. The takeout rate on Sports Action was 40 %.

The Montana Lottery currently offers a lottery based sports betting game based on NASCAR automobile racing. Called Fantasy Auto-Racing, this game is

⁷ See Strumpf (2004).

effectively a NACSAR parlay bet. Bettors select five drivers participating in each week's NASCAR race and winners are determined by the number of points earned by the five drivers selected. Bettors can wager between 5 US-Dollars and 100 US-Dollars per ticket. Payouts are pari-mutuel, and the takeout rate is 26 %. The Montana Lottery plans to offer a football betting lottery in the 2009 NFL season.

Match Fixing, Gambling and Professional Sports

Professional sports leagues are unique business entities. As Neale pointed out, sports leagues rely on competition to make their product interesting⁸. One team cannot produce a successful product alone – it must have another team, an opponent, for the product to manifest itself. The product is the uncertainty of game outcome which in turn affect league standings – a cumulative total of individual games. The uncertainty of game outcome is the core of the sports product⁹ and has resulted in the treatment of sports leagues as monopolies¹⁰. This monopoly status, according to sports leagues, is “necessary to bring about the ‘equalization of playing strengths among teams’ and to maintain public confidence in the honesty of the games”¹¹. A loss in public confidence about the integrity of games can depreciate the “brandname capital of the firm”¹² as well as the legitimacy and reputation of the league. The biggest direct threat to the integrity of games and the legitimacy and reputation of leagues are match fixing and point shaving.

The early history of professional baseball in North America illustrates the evolution of professional sports' position on the consequences of match fixing. Soebbing describes the prevalence of gambling in early professional baseball¹³. In the early years, betting and match fixing were relatively common. The biggest reason was low player salaries. A sports bettor could offer a relatively small sum of money to a player in exchange for fixing the outcome. The bettor would then make money from the bet, and the player would earn enough

⁸ See Neale (1964).

⁹ See Mason (1999).

¹⁰ See Neale (1964); El Hodiri/Quirk (1971).

¹¹ El Hodiri/Quirk (1971, p. 1304).

¹² Mitchell (1989, p. 603).

¹³ See Soebbing (2009).

money to support himself and his family without taking a second job. Professionalization, in the form of regular salaries for players, arose in the 1870s and while it helped to mitigate match fixing, salaries still were not high enough to completely discourage players from throwing games.

The event that altered the landscape of baseball was the 1919 “Black Sox” scandal. The “Black Sox” scandal refers to a group of eight Chicago White Sox baseball players who took money from sports bettors in exchange for throwing the World Series, Major League Baseball’s championship series. The consequence for the eight players was a ban for life by commissioner Kenesaw Mountain Landis. The penalty given to the eight baseball players “was taken not only to punish the misdeeds, but also to deter future misconduct of the same or similar type”¹⁴. There have been other instances of professional athletes throwing games but with the rise of professional salaries in addition to the threat of a lifetime ban, these instances are becoming less prominent. Recent examples include Major League Baseball player/manager Pete Rose in the 1990s, when a coach bet on games involving his team, and the Serie A match-fixing scandal in 2006.

Today, the large salaries earned by professional athletes deters most throwing or fixing of games. However, two groups remain vulnerable to match fixing: unpaid or relatively low-paid, low-profile athletes and referees. Amateur athletes, particularly those playing college athletics in United States, resemble early professional athletes in that they are not well compensated. In fact, college athletes only “earn” the value of their scholarship and room and board expenses. Research estimates the marginal revenue product of a major college football or basketball player at close to a million dollars a year for the university that the athlete attends¹⁵. Research examining point shaving – a player performing in a way that leads the team to lose by less than the point spread of a game – has shown that this exists in college basketball¹⁶.

Examples of low profile athletes fixing matches can be found in professional tennis. High profile tennis players such as Roger Federer and Rafael Nadal earn salaries comparable to professional athletes in major team sports. However, lower ranked professional tennis players are susceptible to match fixing due to not only their low earnings but also because of the individual nature of the sport. In 2007, the internet gambling company Betfair alerted the

¹⁴ Abrams (2006, p. 38).

¹⁵ See Brown (1994).

¹⁶ See Wolfers (2006).

WTA about highly suspect betting volume on a tennis match that paired a ranked player with an unranked player.¹⁷ Tennis's governing body launched an investigation and many players stated that they were approached by bettors who were offering to pay players to fix matches. Robson reported that the situation "constitutes one of the most dire threats tennis has faced in the post-1968 professional era"¹⁸. Since then, professional tennis has been on high alert for potential matches that have been fixed.

The second group that can be susceptible to match fixing are referees. Similar to lower ranked tennis players and US college athletes, referee wages are low. In addition, referees, no matter the sport, can single-handedly affect the outcome of matches. Recently, two major cases of referees being found guilty of match fixing have occurred. The first was in 2005 in the German Bundesliga. In that year, a group of referees expressed concern that another referee in the second division made calls that were deliberately determining the outcome of the match. An investigation determined that the referee was fixing matches for a group of Croatian bettors with ties to organized crime¹⁹.

The second incident occurred in the National Basketball Association (NBA) in North America in 2007. Tim Donaghy, a long time NBA official, was arrested and subsequently plead guilty to fixing games in the NBA. One of the games in question was a playoff game. A letter filed in court by Donaghy's attorney said that "The N.B.A. allowed an environment to exist that made inside information, including knowledge of the particular officials who would work a game, valuable in connection with predicting the outcome of games"²⁰. As a result, the NBA made changes to many policies including the releasing of the names of officials working games as well as the rules governing gambling by officials²¹.

Match fixing or the potential for match fixing has existed for as long as sports have been played. The increases in player salaries and the professionalization of sport decreased the incentive to fix matches in some leagues. However, problems still exist in leagues with a wide disparity in wages as well as with referees, who earn much less than players.

¹⁷ For further description of this situation and betting in professional tennis, see Soebbing (2009).

¹⁸ Robson (2007)

¹⁹ See Starcevic (2005 a) and (2005 b); Associated Press Newswires (2005).

²⁰ Schmidt/Beck (2008).

²¹ See Sheridan (2007).

Gambling as a Benefit to Sport

Match fixing and point shaving clearly represent threats to sports leagues. As stated earlier, leagues take this matter very seriously and attempt to ensure that matches played have maximum uncertainty of outcome. However, sports gambling and the people who participate in the betting market are important stakeholders for sports leagues. Without an opportunity to gamble on sports, some forms of sports may not exist. Even sports that would exist without betting have been influenced in some way by the betting market.²² By offering opportunities for individuals to make bets on matches, sports betting increases the exposure of sport and the number of people consuming the sport product. By increasing consumption, the teams and leagues receive additional revenues from revenue streams such as media contracts and sponsorship agreements. In some sports, the bookmakers and sports leagues have formed explicit agreements. For example, three leagues in Australia – Cricket Australia, Australian Football League, and PGA Australasian Tour – have formed a profit sharing agreement with Betfair.²³ By entering into this agreement with Betfair, leagues not only receive additional revenue generated from their sports, but also collaborate with Betfair if any “shady” or abnormal betting occurs in specific matches/events.

Another positive outcome of sports betting is sports betting markets can detect any abnormal betting in matches, indicating that some type of match fixing may be occurring. For example, consider the match-fixing problems in professional tennis discussed above. Without a sports betting market and collaboration between sports bookmakers and sports leagues, the detection of match fixing in professional tennis might not have occurred. Once abnormal betting volume appears, bookmakers or gambling websites, such as Betfair, can notify the appropriate leagues. This occurred for the tennis match-fixing scandal, and is clearly in the best interest of both the bookmaker and the league. The bookmaker can maximize the number of people who bet on a particular event and generate the highest profit while the league can increase consumption by offering the most uncertain outcome it can to maintain the legitimacy of the league in the eyes of its stakeholders. In addition to using the sports betting market to detect match fixing, sports leagues rely on many different out-

²² See Forrest/Simmons (2003).

²³ See Asia Pulse (2006); Australian Associated Press (2006).

lets and stakeholders (the media is an example) “to serve as watchdogs to preserve the integrity of its game”.²⁴

Empirical Analysis

Sports betting generates positive and negative consequences in sport. In both the US and the EU, sports bettors will soon see expanded opportunities to place bets on sport. In order to get some insight into the potential impact of these expanded sport betting opportunities in the US and the EU, we analyse the characteristics of sports bettors in Canada and the UK using data from two recently conducted surveys of gambling behaviour from each country. These surveys contain relatively similar questions about sports betting as well as questions about the economic and demographic characteristics of respondents.

The Canadian data come from a 2002 survey of gambling prevalence conducted as part of the Canadian Community Health Survey (CCHS). This survey included a random sample of all Canadians over the age of 17. These data were collected through a random digit dial (RDD) telephone survey. The survey was conducted from May to December 2002. Over 36,000 households participated in the survey.

The UK data come from “Taking Part: The National Survey of Culture, Leisure and Sport”, a nationally representative survey of the adult population of England conducted in late 2005 and early 2006 by BMRB Social Research for the Department for Culture, Media and Sport. These data were collected during a face-to-face interview lasting 35 minutes on average. Just over 26,000 households participated in the survey. In addition to questions on gambling, this survey contained detailed questions on sport participation and participation in cultural activities like attending concerts, museums, and historical sites.

Both surveys contained questions about participation in sports betting. Although the types of questions differed, the key point is that all three surveys allow us to identify people who have bet on sporting events in the past. In addition, residents of all three countries have easy access to sports betting opportunities. In Canada, sports betting games are offered by monopoly lottery companies that operate a large number of retail outlets and advertise heavily on TV and radio, and in print media. In the UK, private bookmakers operate thousands of betting shops all over the country. In addition, bookmakers and foot-

²⁴ Mehta (2005).

ball pool operators take bets and entries over the Internet. Access to legal sports betting opportunities should not be a problem for potential sports bettors in these three countries.

Characteristics of Sports Bettors

Table 1 summarizes the estimated participation rates in sports betting markets, and frequency of sports betting in the three countries. The UK survey contained questions about sports betting, including fixed-odds betting on events like football matches and participation in football pools, in the last week and the last year. The Canadian survey asked questions about participation in Sport Select, the sports betting game operated by lottery operators across Canada over the past year.

Table 1: Estimated Sports Betting Participation

	Canada	UK
Weekly Participation Rate	0.79	2.22
Annual Participation Rate	5.18	5.15

The estimated participation rates in sports betting markets are similar in Canada and the UK. The effective price of making a bet on a sporting event also plays a role in determining participation rates in sports betting markets. In the UK, a bettor can place a fixed-odds bet on an individual football match, or other sporting event, with any one of the numerous private book makers operating in that market. The UK is the only market where a bet can be placed on an individual game or match. In Canada, a bettor must bet on a minimum of two sporting events. The effective cost of a bet also differs due to takeout and overround in each market. Canadian sports bettors face overround of anywhere from 160 % to 300 %, while English bettors face an overround of only about 110 %. This difference in cost does not appear to affect the sports betting market participation rate in Canada, suggesting that sports bettors are insensitive to the effective price.

The Canadian survey also asked questions about the frequency of participation among participants. The bottom panel of Table 1 summarizes these responses for sports bettors. In Canada about half of the sports bettors bet at

least monthly and half participate infrequently. Infrequent participants only bet on sports occasionally, or may have only bet on sports on a handful of occasions. Many of these individuals would not report betting on sports in the last year because of the sporadic nature of their participation. But infrequent participants would answer yes if asked if they had *ever* bet on sports, even if they only be on sports one time years ago.

Both surveys contain detailed demographic and socioeconomic information about respondents. Table 2 summarizes some of the characteristics of sports bettors in these two countries.

Table 2: Characteristics of Sports Bettors

Variable	Canada	UK
Average Age	35.30	43.86
Average Income (000s per year)	52.02	34.57
% male	0.82	0.79
% single	0.36	0.38
% who attended college	0.57	0.29
% employed	0.82	0.69
Average # of Persons in Household	2.17	2.50

Canadian sports bettors tended to be younger and English sports bettors older. The income variables were household income in both cases, and the reported figures have been converted to 2006 US-Dollars using the Purchasing Power Parity exchange rate estimates published by the OECD. Canadian sports bettors had a higher income in comparison to sports bettors in the UK. The estimated average household income of sports bettors in the UK is roughly equal to the median household income in the UK; the estimated average household income of Canadian sports bettors is well above the median household income in Canada.

Sports bettors in both countries tend to be male and employed. They also tend to be not single. The other marital status categories include married, cohabiting, divorced and widowed. The level of education of sports bettors varies

widely across the three countries. Sports bettors in the UK tend to be less educated than in Canada; only 29 % of them attended college.

Conditional Analysis of Sports Betting Market Participation

The unconditional statistics discussed above provide important information about the characteristics of sports bettors in Canada and the UK. However, a conditional analysis of the factors that explain observed variation in sports betting market participation can also uncover important features about consumer behaviour in these markets.

Our conditional analysis of consumer participation in sports betting markets is based on a probit model. Consider a latent variable Y^* that reflects the net utility that an individual gets from betting on a sporting event. Y^* is determined by characteristics of the individual and the sports betting market that the individual can participate in, and a random variable capturing other factors that affect the utility derived from betting on sporting events:

$$Y_i^* = \beta X_i + e_i \quad (1)$$

where X_i is a vector of individual and market characteristics, β is a vector of unknown parameters, and e_i is a mean zero constant variance random variable that captures all other unobservable factors that affect the utility individual i receives from sports betting. If $Y_i^* > 0$, the individual bets on sports and if $Y_i^* < 0$, the individual does not. Define an indicator variable Y_i that is equal to one if individual i is a sports bettor and equal to zero if individual i is not a sports bettor. The unknown parameters in Equation (1) can be estimated by the standard probit estimator:

$$P[Y_i = 1 | X_i = x_i] = \Phi(\beta X_i) \quad (2)$$

where Φ is the cumulative normal distribution function.

Table 3: Probit Marginal Effects – Participation in Sports Betting

Variable	CANADA		UK	
	Parameter	P-value	Parameter	P-value
Age	-0.001	0.001	-0.001	0.001
Income	0.0002	0.001	0.0003	0.001
Male	0.057	0.001	0.070	0.001
Single	0.002	0.365	0.003	0.466
College	-0.001	0.567	-0.013	0.001
Employed	0.011	0.001	0.013	0.001
# in Household	-0.004	0.009	-0.004	0.001
Observations	36 984		22 497	
Pseudo-R ²	0.141		0.080	
Log Likelihood	-6 470		-4 461	

Table 3 contains the marginal effects implied by the parameter estimates from Equation (2) and the P-values for a two-tailed t-test of significance on these parameters, and basic summary statistics from probit models estimated using data from the three surveys described above. This set of explanatory variables has been used to explain participation in gambling markets in a number of previous studies.²⁵

Three consistent determinants of sports betting emerge from these results. First, males are more likely to bet on sports than females. The marginal effect is similar in the two countries. The evidence clearly suggests that men are more likely to bet on sports than women. Second, the likelihood that an individual bets on sports falls with age in both countries. Alternate probit models that included age squared were estimated in order to determine if the relationship between betting on sports and age was non-linear. The estimated parameters on the age squared variables were not statistically significant. Third, the likelihood that an individual bets on sports increases with income.

²⁵ See Scott/Garen (1994); Farrell/Walker (1999); Worthington (2001).

Although the marginal effect is not large, this suggests that sports bettors tend to have somewhat higher incomes than people who do not bet on sports.

Marital status, employment status, and household size are not strongly associated with the tendency of individuals to bet on sports. The relationship between education and sports betting is mixed. In the UK, individuals who did not attend college are more likely to bet on sports, while the level of education is not associated with the likelihood that an individual bets on sports in Canada.

The general picture that emerges from the conditional analysis of participation in sports betting markets in Canada and the UK is that sports bettors tend to be younger males with relatively high income. These results hold in two countries with legal and easy access to sports betting opportunities. The specific types of sports betting available differ as well, with more sports betting options available in the UK and fewer in Canada.

Discussion

We motivated this paper with two types of proposed changes in the availability of sports betting opportunities: the creation of new sports betting opportunities where none previously existed and the elimination of all sports betting opportunities that have taken place recently in the US; and the proposed expansion of existing sports betting opportunities beyond the current system of state-sponsored monopoly sports betting currently in place in many EU countries. In both cases, the welfare of sports bettors and government revenues generated from implicit or explicit taxation of sports betting will be affected by these changes in betting opportunities.

Who Will Bet on Sports if Betting Opportunities Expand?

Based on our analysis of the characteristics of sports bettors, annual participation in sports betting markets is low. Less than 5 % of the survey respondents in Canada and the UK reported betting on sports in the past year. Although lifetime participation may be high, casual gamblers appear to bet on sports infrequently in the UK and Canada. In both countries, participants were largely male, and the conditional analysis of participation indicates that participation declines with age. The average sports bettor in both countries had household income at or above the median household income, and the conditional analy-

sis of participation indicates that participation increases with income. Thus, the typical sports bettor is a young male with relatively high income.

Although the annual participation rates in Canada and the UK are small, they are not zero. People in these three countries are interested in betting on sports, and the US is quite similar to Canada and the UK in many respects. This implies that a similar number of people in the US would be interested in legally betting on sports, if available. These potential sports bettors are either not currently betting on sports, or are betting on sports illegally. If they are not currently betting on sports, providing these individuals with legal sports betting opportunities will be a pareto improvement.

The expansion of sports betting opportunities in places like the US where sport betting was not available will likely attract a similar type of individual: young males with relatively high incomes. This profile of sports bettors matches the characteristics of those sports fans who watch sports on television²⁶ and attend live sporting events²⁷. The similar characteristics of sports spectators and sports bettors also suggest that there may be important complementarities in watching sports and betting on sports.

Who Are the Winners and Losers from Expanded Opportunities?

Sports betting markets act as a check and balance system for sports leagues.²⁸ The betting markets increase the consumption for matches and sports leagues overall. In some instances, sports leagues get a percentage of the profits from sports betting while also receiving information regarding potential match fixing. Match fixing and point shaving certainly are sensitive and important issues for all sports leagues. However, leagues can generate policies to help minimize these threats against the integrity of the individual games and the legitimacy of the leagues. This includes making sure athletes, coaches, staff, and officials earn sufficient enough wages to deter them from engaging in matching fixing and/or point shaving. In addition, sports leagues can also have working agreements with bookmakers as well as internal controls to detect the slightest abnormality of a game not being played to its highest uncertainty.

The answer to this question varies in the US and the EU. Recall that sport betting opportunities are being made legal in the US, while in the EU the

²⁶ See Hammervold/Solberg (2006).

²⁷ See Borland/Macdonald (2003).

²⁸ See Forrest/Simmons (2003).

monopoly sport betting operations run by governments may be eliminated in favour of increased competition.

In the US, legal sports betting will be offered where it was previously illegal. As was mentioned above, this opportunity will increase the utility of individuals who would like to bet on sports but were unable to when sports betting was illegal. Since sport betting in Canada, and in the US state of Montana, features extremely high takeout rates or overround, the revenues generated from sports betting should be substantial, benefiting the government and, indirectly, those who receive government-provided benefits financed by the revenues generated from sports betting.

In addition, the government revenues generated from sport betting have two appealing features. First, revenues raised from sport betting constitute a “voluntary” tax in that no one is obligated to bet on sports. Second, the individuals who will likely participate in this activity have relatively high incomes, making this implicit tax both voluntary and progressive.

The most vocal opponents to legalized sport betting in the US were professional sports leagues like the NFL and amateur sports organizations like the NCAA. Since these organizations oppose the legalization of sport betting, they would appear to lose something following the legalization of sport betting. However, these losses are difficult to identify.

Opponents of legalized sport betting claim that the opportunity to bet on sports corrupts participants, including athletes and officials, by creating incentives to fix games and engage in other behaviour like point shaving that reduces the perceived legitimacy of the product. But match fixing and point shaving appear to be rare in North American team sports, based on past cases where participants engaged in match fixing or point shaving were caught and punished. NBA referee Tim Donaghy reportedly gambled on games he officiated in the 2007 season. Prior to this, no allegations of match fixing related to gambling have been made in the four major professional sports leagues in North America in some time. College sports, on the other hand, periodically experiences episodes of match fixing. Examples of match fixing related to gambling in the NCAA include the University of Toledo (men’s basketball and football 2003–2006), Northwestern University (men’s basketball, 1995), Arizona State University (men’s basketball, 1994), and Boston College (football, 1996; men’s basketball, 1978). However, NCAA athletes receive no compensation beyond tuition and room and board, providing NCAA athletes with an incentive to engage in this behaviour. In addition, there are hundreds of Divi-

sion I football and basketball programs in the US, compared to a few dozen professional teams in each league, providing many more opportunities for game fixing.

Also, good reasons exist to believe that the marginal effect of increased opportunities to bet on sport will not affect the incentive to fix games. Sport betting is already legal in Nevada, and internet betting with off-shore sports book is relatively easy, so any potential game fixer already has access to sports betting opportunities. In addition, the other existing sport betting opportunities in North America consist of "parlay" games where multiple contests must be bet on in each game. This clearly increases the cost of game fixing because players on multiple teams would have to be involved. The expansion of "parlay" type sports betting would appear to have only a limited effect on the incentive to fix games in North America.

Two groups would clearly lose from an expansion of sports betting opportunities in North America: illegal sports bookmakers and "offshore" internet sports books that currently operate in the Caribbean and central American countries with liberal gambling laws. An expansion of legal sport betting opportunities in the US would reduce the handle at these locations, if the legal opportunities are substitutes for their betting options.

In Europe, the winners and losers differ significantly. The clear losers will be the state-operated sport betting monopolies, and the groups who receive funding generated by the rents earned by these monopolies. The introduction of competition in European sport betting markets, either in the form of on-line sports books or UK-style private betting shops will reduce the monopoly rents earned by state-operated monopolies. The revenues from state-sponsored sport betting monopolies in Europe typically go to specific activities like the training of elite athletes or the operation of the European club sport system that trains young athletes and organizes competitions. These organizations will have to find new sources of funding if the rents generated from sport betting disappear. The equity and efficiency effects of this change are complex. To the extent that watching sport and betting on sport are complements, sports bettors are potentially a reasonable source of funds to subsidize the training of athletes and the organization of competitions. However, participation in sport may generate other important benefits to both the participants, in the form of enhanced earnings ability and to society in the form of a healthier and happier population. If these benefits are important, then alternative methods of fi-

nancing the training of athletes and the organization of competitions may be desirable.

The winners in Europe will clearly include sports bettors. They will have access to a richer array of sports betting opportunities and will be subject to lower takeout rates and overround. Increased access to higher quality betting opportunities will increase the utility sports bettors get from betting and lower takeout rates and overround will reduce the effective cost of betting. In addition, the expansion of internet betting will reduce the transactions costs faced by sports bettors. These factors will increase the consumer surplus generated by sports betting in Europe. In addition, it is possible that the lower transactions costs generated by increased competition in sports betting markets will lead to increased sports betting in the EU. This could produce more revenues than the existing government operated sports betting operations in the long run, if consumers are sufficiently sensitive to the effective price of betting on sports to enter the market.

References

Abrams, R. I. (2006): Game-Fixing in the national game, Florida Entertainment Law Review, Vol. 1, No. 1, pp. 1–40.

Asia Pulse (2006): Betfair to share wagering revenue with Cricket Australia, Asia Pulse, December 13; <http://global.factiva.com.login.ezproxy.library.ualberta.ca/ha/default.aspx>, Download: June 9, 2008.

Associated Press Newswires (2005): Report: Referee had links to organized Crime, Associated Press Newswires, January 26; <http://global.factiva.com.login.ezproxy.library.ualberta.ca/ha/default.aspx>, Download: July 15, 2009.

Associated Press (2009): NCAA bans events in some states, ESPN.com, August 6, Online: <http://sports.espn.go.com/espn/print?id=4382518&type=story>. Download: August 7, 2009.

Australian Associated Press (2006): Cricket Australia and Betfair sign revenue sharing agreement, Australian Associated Press Financial News Wire, Decem-

ber 16, <http://global.factiva.com.login.ezproxy.library.ualberta.ca/ha/default.aspx>. Download: June 9, 2008.

Borland, J., Macdonald, R. (2003): Demand for sport, *Oxford Review of Economic Policy*, Vol. 19, No. 4, pp. 478–502.

Brown, R. W. (1994): Measuring cartel rents in the college basketball player recruitment market, *Applied Economics*, Vol. 26, No. 1, pp. 27–34.

El-Hodiri, M., Quirk, J. (1971): An economic model of a professional sports league, *The Journal of Political Economy*, Vol. 79, No. 6, pp. 1302–1319.

Farrell, L., Walker, I. (1999): The welfare effects of lotto: Evidence from the UK, *Journal of Public Economics*, Vol. 72, No. 1, pp. 99–120.

Forrest, D., Simmons, R. (2003): Sport and gambling, *Oxford Review of Economic Policy*, Vol. 19, No. 4, pp. 598–611.

García, J., Pérez, L., Rodríguez, P. (2008): Football pool sales: How important is a football club in the top division?, *International Journal of Sport Finance*, Vol. 3, No. 3, pp. 167–176.

García, J., Rodríguez, P. (2007): The demand for football pools in Spain, *Journal of Sports Economics*, Vol. 8, No. 4, pp. 335–354.

Hammervold, R., Solberg, H. (2006): TV sports programs – Who is willing to pay to watch?, *Journal of Media Economics*, Vol. 19, No. 3, pp. 147–162.

Mason, D. S. (1999): What is the sports product and who buys it? The marketing of professional sports leagues, *European Journal of Marketing*, Vol. 33, No. 3/4, pp. 402–418.

Mehta, M. A. (2005): Cheating? Don't bet on it here, *The Star-Ledger*, April 1; <http://global.factiva.com.login.ezproxy.library.ualberta.ca/ha/default.aspx>, Download: July 14, 2009.

Mitchell, M. L. (1989): The impact of external parties on brand-name capital: The 1982 Tylenol poisonings and subsequent cases, *Economic Inquiry*, Vol. 27, No. 4, pp. 601–618.

Neale, W. C. (1964): The peculiar economics of professional sports, *The Quarterly Journal of Economics*, Vol. 78, No. 1, pp. 1–14.

Robson, D. (2007): Match-fixing allegations put tennis officials on high Alert, *USA Today*, December 17; http://www.usatoday.com/sports/tennis/2007-12-17-gambling-cover_N.htm, Download: July 17, 2009.

Schmidt, M. S., Beck, H. (2008): Assertions by ex-referee are dismissed by N.B.A., *The New York Times*, May 20; http://www.nytimes.com/2008/05/20/sports/basketball/20referee.html_r=1&oref=slogin&ref=sports&pagewanted=print, Download: November 5, 2010.

Scott, F./Garen, J. (1994): Probability of purchase, amount of purchase, and the demographic incidence of the lottery tax, *Journal of Public Economics*, Vol. 54, No. 1, pp. 121–143.

Sauer, R. (2001): The political economy of gambling regulation, *Managerial and Decision Economics*, Vol. 22, No. 1, pp. 1–15.

Simmons, R. (2008): Prohibition of gambling, in: J. Medocroft (ed.): *Prohibitions (Readings in Economics)*, Institute of Economic Affairs Monographs, Hobart Paperback, Institute of Economic Affairs, London.

Sheridan, C. (2007): NBA to revamp ref gambling rules; Jackson, Nunn see roles reduced, *ESPN.com*, October 26, <http://sports.espn.go.com/espn/print?id=3079309>, Download: June 12, 2008.

Soebbing, B. P. (2009): Gambling, in: M. Atkinson (ed.): *Battleground Sports*, Greenwood Publishers, Westport, CT, pp. 161–166.

Starcevic, N. (2005 a): German soccer chief says there is evidence of match-rigging, *Associated Press Newswires*, January 23; <http://global.factiva.com.login.ezproxy.library.ualberta.ca/ha/default.aspx>. Download: July 15, 2009.

Starcevic, N. (2005 b): Soccer ref admits fixing games in Germany, *Associated Press Newswires*, January 27; <http://global.factiva.com.login.ezproxy.library.ualberta.ca/ha/default.aspx>.

Strumpf, K. S. (2003): Illegal sports bookmakers. Unpublished working paper, Department of Economics, University of North Carolina at Chapel Hill.

Wolfers, J. (2006): Point shaving: Corruption in NCAA Basketball, *American Economic Review*, Vol. 96, No. 2, pp. 279–283.

Worthington, A. C. (2001): Implicit finance in gambling expenditures: Australian evidence on socioeconomic and demographic tax incidence, *Public Finance Review*, Vol. 29, No. 4, pp. 326–342.