

The use of economic theory to minimize risk in the sports betting market.

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Abstract

In today's society it cannot be argued that sport does not play a massive role in most of our lives. During the 1900's competitive sport started to develop and with this we saw the emergence of something even more ancient than this, money and sport. With the development of society and our technological developments, we have seen massive changes in how both practices are applied. Professional sportsmen are some of the richest people around today and the amounts being waged on sports outcomes a multi-billion dollar business.

With this change we have seen the developments the sport betting industry is making to handle this huge demand and flow of income. These insightful and innovative ways of looking at betting in sports has lead to a new way of thinking about how sports betting should be done. When we start to look at the new betting exchanges that are becoming more and more common we see the links with the betting world and that of the financial world. Companies who have associated some economic theory to the way that they handle how they make their bets, have started to reap the dividends. With one of the strong factors being that the sports market is un-correlated to most other markets, it is starting to look like an attractive way to risk large investments against relatively little risk along with a much shorter time span till returns can be realized.

With this in mind this paper shall try to apply some of the basic thoughts, principles and rational of economic thought to the 2010 World Cup in South Africa. A specific focus shall be placed on looking at portfolio theory and using the principles behind this to bet on who will win the World Cup while being exposed to as little risk as possible.

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Introduction

It is believed that the cumulative viewing figures were 26 billion during the World Cup in Germany 2006¹. This is not so surprising as figures like this seem to have been a common trend for the past few World Cups². What was very intriguing about the latest figures was that it is also believed that 41% of the viewers were female, a notable increase and, that there were on average, 93 million people watching each game³.

Sport thus plays a large part in most of our daily life's, whether it be football or swimming, the intrigues of the game and the excitement and tension created is something that humans have enjoyed for centuries⁴, and will continue to. What we also see, is that the link with sports and the betting world is, both ancient and growing rapidly in today's world⁵. The UK government even put together a non-profit organization, the Gambling Commission to help advise the government on issues related to this rapidly growing and big money industry. This Gambling commission estimated the size of the industry be around 84 billion in the UK alone for 2006/7⁶ and growing rapidly, especially due to the massive reach and potential of the online betting industry.

Where there is big money, one would also expect to find business men, opportunists and academics. A quick glance at the industry reveals that there doesn't seem to be a lack of any of them, perhaps the latter. It's obvious that business men will be involved; either to offer a product in great demand or to apply what they believe to be their superior knowledge to make regular profits. Due to the pure size of the global betting (sports) industry, we have also started to see a trend in which the betting industry is starting to look more and more like a financial market; this is a very important development for both the industry and the consumer. It is then

¹ http://www.fifa.com/mm/document/fifafacts/misc-tele/52/01/27/fs-401_05a_fwc-tv-stats.pdf

² <http://www.fifa.com/aboutfifa/documentlibrary/index.html>

³ <http://www.fifa.com/aboutfifa/marketing/factsfigures/tvdata.html>

⁴ Behavioral Finance and Sports Betting markets, O. Cagdas, P Peare, 2004, PG 21

⁵ Behavioral Finance and Sports Betting markets, O. Cagdas, P Peare, 2004, PG 21

⁶ <http://www.gamblingcommission.gov.uk/pdf/Gambling%20Industry%20Statistics%202008%202009%20-%20update%20-%20October%202009.pdf> PG 3

surprising to see that there is very little academic literature about sport betting, or betting in general. The research and development of economic/business models over the past 50 years has greatly influenced how our financial markets work and the best ways to substance growth/profits etc.

Perhaps it's because the betting industry is small relative to the other industries, thus the lack of academic attention, relatively speaking in comparison to the attention paid to financial markets/institutions. (Most academic attention focus's around the moral implications of betting⁷). The lack of study could also be due to the difficulty of putting theory into practice, with betting on sport involving many difficult human elements.

What I shall be doing is having a more in-depth look at development of the sports betting industry and see how these developments are making it look more and more like a financial market. Once these comparisons are made, I shall have a look at some examples of where a) economic theory has been applied to betting and b) firms that have already crossed the fine line between the betting and financial worlds. I shall then focus on the simple ideas of the portfolio theory, and see if, using the ideas behind portfolio theory, I can use this to bet with less exposure to risk on the World Cup 2010.

⁷ Behavioral Finance and Sports Betting markets, O. Cagdas, P Peare, 2004, PG 45

Methodology

This paper will be divided into three main parts and I shall try to build it up in a logical manner to hopefully bring across the (hoped) importance and relevance of what economic theory can have on the betting industry in particular.

Part one will focus on going into more depth about exactly what the sport betting industry is. I will look at how the industry has developed over time and will have a special focus on what impact the new capabilities of online betting has made. I shall then turn the focus to how odds work, explaining the difference between American odds and European odds as we get a feel for the industry. As we develop our knowledge of the industry and the money involved, we will have a look at how the internet has/is shaping the industry by looking at concepts such as betting exchanges and “shopping for odds”.

Once we have a basic idea of the industry, the paper will move to Part Two. This will focus more on the economic side of the betting industry, with a focus being on the ever more noticeable similarities of the betting market and the financial markets. Certain elements that make up the financial markets will be assessed and I shall then look to draw examples from the betting market to show the trend of more and more similarities appearing. The focus shall be on betting exchanges, risk, and asymmetric information. This part will then move on to look at some examples of where we find economic theory trying to look for ways to both minimize risk and increases net profits. I shall examine some companies who have already applied economic theory to betting in order “to beat the rest”, with a look at the Sharpe ratio comparisons from the S&P500 and betting as an example.

Part Three will then turn to looking at the basic principles of portfolio theory. Here we will just examine the basic ideas and goals of portfolio theory. After this we will look at how I bet on World Cup using portfolio theory to minimize my risks in hope of increased returns. I shall examine the results and expect to see that the model aided me in neutralizing my risk and see if it helped in the quest to reap the returns.

The paper will then end off with a reflection of my personal results with some critique and suggestions. I shall summarize the results and look to the future of sports betting and economics

and have some suggestions and thoughts as I assess sports betting to be a highly relevant industry to investors, business men, the client and academics.

The/Development of the sport betting industry

Sports betting can be defined as “The activity of predicting sport results and placing a wager on them”⁸. This very simple term is easy to understand and this simple idea has been around for a long time.

History books will tell us that betting on sporting activities has been around for as long as we can remember⁹. The most common events during the 19th century were cock and bare-knuckle fights and this flowed over into were the big betting industry started, horse racing¹⁰. Towards the end of the 19th century and during the early 20th century, placing a wager on horses became more and more popular. The act of putting a wager on sports results then started to become more common as people started betting on other events, baseball being one of the first¹¹. The idea of betting then received an explosion during the 60’s and 70’s as more sports started to become televised and more people started having access to watching this¹². This growth of the industry then received another boost in the 90’s as the capabilities of internet started to be explored and resulted in the ease of on-line betting. Despite numerous attempts by governments(in particular the USA) to make people a) aware of the problems related to betting/gambling b) make gambling illegal, the industry is thriving. It is believed that 15% of Americans will place a sports bet of some kind this coming year¹³ and the industry is also preparing itself for a new development

⁸ http://en.wikipedia.org/wiki/Sports_betting

⁹ Behavioral Finance and Sports Betting markets, O. Cagdas, P Peare, 2004, PG 22

¹⁰ Behavioral Finance and Sports Betting markets, O. Cagdas, P Peare, 2004, PG 24

¹¹ <http://www.ultimatecapper.com/history-of-sports-betting.htm>, J. Martin

¹² Behavioral Finance and Sports Betting markets, O. Cagdas, P Peare, 2004, PG 24

¹³ <http://www.ultimatecapper.com/history-of-sports-betting.htm>, J. Martin

which could perhaps have the same influence that both the television and the internet did in the 70's and 90's respectively.

Some facts and figures related to the industry in UK:

Information taken from regulatory returns 1 January 2008 to 31 December 2008¹⁴

Number of employees (Full Time Equivalent) **43,133**

Number of employees (headcount) **57,613**

Off course returns

Turnover £ million	Gross profit £ million	Number of bets million
Dogs	1,646.8	312.2
Football	980.0	221.8
Horses	6,401.6	891.6
Number	874.6	168.3
Other	913.9	123.2
Total	10,816.9	1,717.1
		1,544.3

Table 1

The above information applies in particular to the UK and the UK is used as an example as, despite it not being the biggest market for betting (Asian growing very quickly due to ease of online betting), it is one of the oldest and best functioning¹⁵. In the USA it's illegal, except in Nevada so the UK is more interesting as the idea of a free/developed market rules more than in the USA. The figures are more for interest and of course to show the amount of money the industry is involved in.

¹⁴ Industry Statistics 2008/09, Gambling Commission, Oct. 2009.

¹⁵ Behavioral Finance and Sports Betting markets, O. Cagdas, P Peare, 2004, PG 23

The betting world, like in the financial world (e.g. bonds) also has what some find a rather complex way of stating the odds. There are a couple of different ways of stating the odds and knowing how the odds work and how they are stated is obviously essential to the whole idea of betting.

European (Decimal) Odds:

Used in EU, Canada and Australia. This is shown as the ratio of full payout to stake in a decimal form and includes the capital¹⁶. 2.00 is an even bet. Due to the fact that the capital is included, can have psychological effects on betters as the returns can appear higher.

American (Fractional) Odds:

Used in the US. Shown fractionally and don't include the capital involved. An even bet would be 1/1(the same as 2.00 from a European Odd). American odds state the profit while European the income.

Table 2

Decimal	Fractional
1.50	1/2
2.00	1/1
2.50	3/2
3.00	2/1

Table 3

x	To	Convert
Decimal	Fractional	x-1, then convert to fraction
Fractional	Decimal	Divided fraction, then x+1

The above tables show some equivalents of the two systems while table 3 shows the basic manner in each a person can convert the odds. Below is an example:

Stated US odds: 10/13. This means that the odd maker will give \$10 for every \$13 bet.

Converting to a European odd: $(10/13 + 1) = 1, 77$.

¹⁶ Behavioral Finance and Sports Betting markets, O. Cagdas, P Peare, 2004, PG 25

The effect of the online industry for betting

We shall now continue to the modernization of the betting industry and see how it is using and embracing technology. One of the major developments, as mentioned previously, is that of the online industry. The fact that internet has steadily become more accessible for users since the mid 90's has seen a massive re-invention of the sport betting industry. Along with the fact that this online world of betting was available, it also coincided with the rise in credit card holders worldwide. Initially people didn't embrace this new system to enthusiastically due to the fact of mistrust¹⁷. It wasn't till around the early 2000's, once online security became quite an issue that people started trusting this new form of betting and embracing it.



Table 4: Showing the almost exponential rise of the online betting industry.¹⁸

Since then we have seen a meteoric rise in the amount of both users and amount of money coming from online activity. The ease of making a bet was of course very attractive, both for consumer and firm. People could make bets whenever they wanted and more importantly, allowed "shopping for odds" to become much easier. Access to all companies odd's for a specific sporting event used to differ quite substantially. Bettors would have the choice of going around to all odd makers to find, in their opinion, the most fair and realistic odd's. This is of course quite a big obstacle and will cost a lot of time and effort and most people wouldn't do this

¹⁷ http://money.cnn.com/2004/03/26/commentary/column_sportsbiz/sportsbiz/

¹⁸ http://money.cnn.com/2004/03/26/commentary/column_sportsbiz/sportsbiz/

as they might not even have an idea that there are different odd's being offered, for the same event, by different “bookies”. This of course played into the hands of the bookies as they could set the odd's to ensure that they made the best profit. While the opportunities for arbitrage costs exist in this system, this would only really apply to the people with this knowledge and for the average investor these issues might have contributed to choosing not to place a bet. What the online step of the betting world brought with it was ease and accessibility. Book makers started to realize that people now had access to all odds on a specific event from various firms at the click of a button. Obviously, people where choosing their most favourable odd's and firms that weren't offering good odds weren't being used, supply and demand. This led to a revolution amongst the major players in the betting industry as they all realized that offering unrealistic odd's or including too much commission would lead to the end of the firm and thus they all started converging towards common odds. This might have taken the available arbitrage costs out of the market for the people who were “in the know”, but what it has done has make the market for finding your odd's a lot more fair and on the back of all the other advantages of online betting, has provided the basis for new age betting on sports which is now more accessible and affordable to the public than ever before, a very good sign for the industry and the competitors involved.

Betting exchanges

As the betting world has embraced a new era, based namely on the rise in the online demand and accessibility, they have also looked at new ways in which we can place/are able to place, our bets.

The current development is the betting exchange, described simply as “a stock exchange for bets”¹⁹. This concept originated round May 2000 from the online betting firm, Flutter.com²⁰. Another company took to the idea, Betfair.com, and developed the pure exchange model which was later adopted by Flutter.com but the first mover advantage by Betfair.com has ensured that

¹⁹ http://en.wikipedia.org/wiki/Betting_exchange

²⁰ http://en.wikipedia.org/wiki/Betting_exchange

they are the largest bet exchange in the world²¹. They are believed to have more than 800 000 registered customers and have a turnover of more than 50million/week²².

Before we focus on which firm/s have turned into the major players in this modern form of betting, I am first going to look at the basic idea, and perhaps reasons for the success of the betting exchange.

The betting exchange allows someone to make a bet against odds set/requested by other gamblers. One can make a “Back” bet which is the normal bet on a team to win or a “Lay” bet which is on the opposite side of a “Back” bet. This system thus eliminates the book maker and it is claimed that this system has seen on average a 20% better offering of odds offered by a book maker²³. The fact that the middleman has been eliminated has also seen the dramatic decline of the charges of commission, as low as 5 %²⁴. The betting exchange uses decimal odds as they seem to be more common and a specific sporting event is seen as a “market”. This system has been compared to selling and buying derivatives on the stock market and thus also seen a big rise in investors using the betting exchange to expand and diversify their portfolios. (*For a simple illustration of a betting exchange please refer to figure 1 in the appendix*)

It's a simple system that has taken many hints and tips from the stock exchange. These new kinds of development in the betting industry are not only making betting easier, more affordable(less commission) but I believe also showing that the betting industry is only getting more “developed” and I think more and more relevant to investors and academics.

²¹ BBC News, How does the betting exchange work, C. Summers, Dec 2007

²² BBC News, How does the betting exchange work, C. Summers, Dec 2007

²³ Betting markets: Trading without dark pools, N. O' Connor, 2009

²⁴ BBC News, How does the betting exchange work, C. Summers, Dec 2007

Sports & Financial Markets

When you look at what comparisons we can make between financial and sports markets, we are looking to see to what extent they are similar and hopefully justify the use of economic practice in the sports sector. Perhaps not all part of a particular theory will be applicable to the sports world due to the nature of it, but we aim to see the many links to apply our economic intellect to the sports world.

The main, and very obvious, similarity is that in both there are investors aiming to seek profits and avoid losses. This is the basis of both worlds and what we then see is that all these agents also want to avoid as much(if possible, all) unnecessary risk and keep their other investments as low on risk, in correlation with returns, as possible. A lot of economic literature revolves around the ideas and principles of risk management and is seen as a paramount topic in the business world, much of this could be applied to the sports betting world.

The previous section introduced the fact that we now having betting exchanges which are being “played actively” everyday. This not only revolves around big revenue (\$50million/week Betfair) but also the other interesting developments we have seen like the derivative like system of offering or buying bets and fairer odds (market decides). To understand the functioning’s of such an exchange is not a simple task, but the simpleness of the betting system allows it to functioning with the betters themselves acting like investors. If the betting system is becoming more like the financial markets, we need to start handling our betting like in the financial world.

Another very big similarity for the two is information, in both worlds it can be and most often is, priceless. In the financial world we have the idea of The Efficient Market Hypothesis. In the financial world inside information is obviously very beneficial, it’s also the information that gets released so frequently that investor needs to understand, work through and distinguish what is relevant to his investment opportunities. In the sport world this is no different with the transfers of players, injuries and weather all having the potential to influence ones investment. It thus means that if one wants to do well in the sports market that he/she will have to constantly be updated but at the same time question things like the source, the motive etc. For the betting

exchange above we could perhaps also start to see an adjusting of “odds” with the release of certain sports related information, just like in financial markets.

Another, perhaps less obvious, similarity is the exposure to what Nassim Nicholas Taleb described as a “Black Swan”, or the impact of the highly improbable²⁵. While this might not seem like the most relevant comparison between the two, it is something that can have drastic influences on one’s returns or influence anticipated results quite significantly(positively and negatively). In the financial world we know what the impact of something like 9/11 or the BP Gulf oil leak can have on the business world. For the sport world, which is pretty much uncorrelated to all other markets, we have seen incidents like in Angola where terrorists attacked the Togo football side or the cancelation of numerous sports events due to the ash cloud drama in April 2010. These incidents happen without us having a chance to prepare for them, but the knowledge that they can occur should prompt cautioned and rational investment logic in both worlds.

We can see that there are some big examples of where these two markets show a lot of similarities. While there are also examples of major differences in these markets, I think that the understanding of the similarities can help identify which economic logic is most applicable to the sports world. Knowing which differences exist is of course also very useful, I think that most of these differences arise due to the nature of sport betting e.g. the time period from investment to returns. In sport it’s a much shorter time frame were as investing is mostly by nature, more long term.

²⁵ Taleb, Nassim Nicholas, *The Black Swan: The Impact of the Highly Improbable*.

Economic theory to maximize returns

This section will look at examples of where we are already seeing the ideas from economics being put into practice to help reap higher returns. This shall be followed by an example of where academics are starting to get increasingly involved in the link between “sports and economics”.

*“Betting odds represent the bettors' perception of value, not actual value. Our systems are able to pinpoint and exploit pricing opportunities created by the irrationality of sports bettors and the need for sportsbooks to balance their risk exposure. By examining 20+ years of betting line data with our proprietary betting trends, we've developed profitable betting strategies based on cutting edge "market efficiency" economic theory.”*²⁶

The above is the philosophy of the company “Sports Insights”. This is a company that has decided to employ financial analysts and economists to develop what they call a “winning system”. They believe that this is the secret to winning along with good money management and claim to have a +50% winning record. This company offers four kinds of “products”:

Smart Money - *When the line moves in the opposite direction of the public betting trends, a Smart Money pick is triggered. This is a sure sign that a pro betting syndicate has placed a large wager on that team. We've calculated the optimal formula for triggering Smart Money picks.*

Steam Moves- *Sudden uniform line movement across the entire sports betting marketplace. This is a sure sign that a pro betting syndicate has bet that team. We show you which Steam Moves to follow and which to avoid.*

Square - *Bet against the public on the days most lopsided bet games. We've calculated the optimal formula for betting against the public.*

²⁶ <http://www.sportsinsights.com/sports-betting-systems.aspx>

Best Bets - Plays are handpicked by the Sports Insights staff from our portfolio of betting systems. It's an executive summary of the day's most profitable plays.²⁷

These products display firstly, that this company has managed to sustain itself for the past 11 years using its “formula’s” and economic approach and, that it has had a large enough demand for its product. This indicates that developing models to run sport data can be a sustainable idea and once again shows the fine line between economics and the betting industry and shows how people making the link are prospering.

Another example of a company using economic thinking to beat the market in sports is Dr. Bob Sports. This company was set up by statistics students from the University of California, Berkley in 1987²⁸. They apply various statistical models to the information that was available to them and started creating what they called “Best Bets” and have seen very good returns on this bets for the past 22 years (*See Appendix Figure 2: Dr. Bob results*). The company also writes “sporting essays” where ideas like variance, Bayes Theorem and the Sharpe ratio get explained and related to how they are used during/for the decision making process, or to assess results.

The Sharpe ratio as we know determines the performance of a portfolio, ex-post. Dr. Bob Sports shows how, in a simple example of how their “best football/basketball bets” would achieve a higher Sharpe ratio than the S&P 500 using the long term return of 10%, a given 3.5% r_f and 16% Standard deviation²⁹:

Sharpe Ratio: $R - R_f / \sigma$ (R: return, R_f : Risk free rate, σ : Standard deviation)

S&P500 Sharpe Ratio $(10-3.5)/16 = .405$

²⁷ <http://www.sportsinsights.com/sports-betting-systems.aspx>

²⁸ <http://drbobsports.com/about.cfm>

²⁹ <http://drbobsports.com/essays.cfm?p=17>

With Dr. Bob's Sport performance being 72.98% return and standard deviation of 97.08% from the past ten years:

$$(72.98-3.5)/97.08 = .715$$

This shows that they have had both higher returns and a better Sharpe ratio from applying their methods and for this firm the fact that sport is not positively correlated to other markets makes it a very attractive market to be in.

These are two examples of firms crossing the lines of their economic knowledge and applying it to the sport betting world. As both firms have found out, we need to apply the most relevant theories as it is a different market but that there are enough economic theories that can be applied already. Until then, there is more theory and research required to find out how to maximize betting systems. In the next section I shall try to identify my own economic theory that I hope will aid me in minimizing my risk exposure in the betting market.

Portfolio Theory

I now turn my attention to portfolio theory to see what I gain understand/gain from it in hope of it aiding me in finding a betting system for the World Cup 2010. When I look at the principles and basic ideas of portfolio theory, I will be aiming to identify structures and rational that will contribute to me making the most of the investments/bets.

The portfolio theory focus is quite simply aimed to develop a sound investment portfolio from the available investment opportunities, while looking for the correct trade-off for risk³⁰. It focuses on using the right decision making process for an investment. This can be broken down into 3 major stages³¹:

- 1. Analyze all relevant characteristics of individual securities.*
- 2. Combine the individual securities into an efficient investment portfolio.*

³⁰ Finance 1, MJ van Assem et al, First Edition, PG 57, 2007

³¹ Finance 1, MJ van Assem et al, First Edition, PG 57, 2007

3. Choose the investment portfolio.

This indicates the seriousness that portfolio theory places in picking one's investment opportunities carefully and thoughtfully.

Portfolio theory looks at the high value of spreading risk and places an emphasis on maximizing ones return for the least risk possible. When one starts to look at putting together the optimal portfolio, given resources, we can find many formula's that can indicate expected return while working out portfolio risk. I will look to the ideas of portfolio return and general return of my portfolio, while looking (hopefully optimally) at how much of my wealth I should put into each bet. While doing this I will also look to keep the overall risk of my portfolio as low as possible.

I shall take the ideas from portfolio theory and see where I can adapt them to my investment decisions I will have to make for the World Cup. The overall idea I shall take with me is the idea that one can diversify away from risk by having more securities and hope to apply this efficiently.

The other idea which I shall also take from portfolio theory is that forecasters will of course differ, as will their attitude to risk and this then implies that investors will have different efficient portfolios.

It must be mentioned that there is a some criticism and disagreement in the academic and business world surrounding portfolio theory³². While this has been taken into consideration when looking at which economic theory to try in the example, it was felt that the criticisms were focused largely on the intricacies of the portfolio theory and the more statistical basis of Portfolio theory. The example shall thus look to use the manner of picking one's "investments" more and the thought process behind it, rather than applying the many formula's that have sparked much debate.^{33 34}

³² Taleb blames portfolio theory; Markowitz defends it, A. Agrawal, Dec, 2008.

³³ http://en.wikipedia.org/wiki/Modern_portfolio_theory

³⁴ Taleb blames portfolio theory; Markowitz defends it, A. Agrawal, Dec, 2008.

Betting on the World Cup 2010

When it came to looking at the World Cup and trying to decide which team would win, where one should place his/her bets, I decided to look at the lessons I could take from economic theory, in particular Portfolio Theory. I would hope to use the rational and logical way of thinking I'd learnt to places my bets on the World Cup in a way that minimized my risk and hopefully, lead to profits. The World Cup is obviously a very complicated event to predict with a lot of factors playing a role from form, to team, to altitude. Choosing a winner is then made more complicated by the fact that one has 32 possible winners, and the idea that better teams could knock each-other out and then have a day off and one would be 2 rounds further with an underdog in the semi-finals. The approach below will try to assume that one has a little bit of knowledge regarding the sport, otherwise the basics of investing would tell you to not get involved in markets where one has very limited knowledge. The idea below however will hopefully aid those with limited knowledge in picking their best “portfolio structure” and ideally, limit exposure to risk.

The first approach would be to follow the 3 basic stages described above in portfolio theory.

1. Analyze all relevant teams (*1. Analyze all relevant characteristics of individual securities.*)

Start by looking at the 32 sides participating and deciding how many sides one would like to bet on. In this case we'll pick the top five candidates to win the tournament, before looking at their odds; we first want an unbiased and uninfluenced opinion. (For ease of developing the case, I am going to go on my own knowledge and “understanding” of the event(market) as I have avidly followed football for 12 years and came first in the Netherlands for UEFA's Champions League Prediction game, thus for sake of argument, qualified to judge the bets (the investment opportunities)). For people with limited knowledge the most simple start would be to look at the FIFA world rankings as a basic guideline(*See Appendix: Figure 3 for pre-World Cup rankings*), while for the more serious better, following the press coverage and build up can be seen as an invaluable way of attaining information that will aid in the investment process. Another thing that one could have a look at for general and current

form, is how the qualification went for the side in question (although caution must be taken here as quite often the “bigger/stronger” sides don’t always play with full strength sides) as it can give some extra insight into choosing between similar “investment opportunities”.

I came out with two distinct “safe bets” in:

Brazil (Ranked 1st pre-world cup, as are all rankings³⁵) and **Spain** (Ranked 2nd) and then proceeded to look at other “realistic” options:

Netherlands (Ranked 4th): Very good individual players, did well in The Champions League, easy pool and one potential tough game in the quarter finals vs. Brazil.

Germany (Ranked 6th): Young, unknown side, no Ballack. The very idea of a “tournament team”, always does well. Winning mentality, strong team spirit.

Argentina (Ranked 7th): Have the players to beat anyone, Messi alone, but unsure of unity as a team. The coach’s experience can be questioned as well as their recent form.

England (Ranked 8th): Good players in all positions, except keeper. Very good coach who should be well prepared. Easy pool.

Outsiders: **Portugal** (Ranked 3rd): too little quality in the end, unrealistic ranking after a shaky qualification, tough pool.

Ivory Coast (Ranked 27th): Strong side but pool perhaps too much for them, unrealistic ranking in comparison with odds.

Italy (Ranked 5th) - Defending Champions, but an aging side. The lack of quality sides in the Serie A could reflect the lack of quality available to the selectors.

This was how I approached my potential investments and would have to make a decision essentially between the sides above, eliminating three.

³⁵ <http://www.fifa.com/worldfootball/ranking/lastranking/gender=m/fullranking.html#confederation=0&rank=193>

To aid me in eliminating these 3 sides and choosing my most preferred and hopefully most profitable combination, we turn the odds being offered by all the sides in question. Looking at the odds (pre-World Cup) after doing many hours of “odds shopping” I found all odds to be very similar, but decided Ladbrokes to be the best and was also one of the largest and safest betting agencies and would thus use them throughout the World Cup to track the odds.

Netherlands 1-11

Germany 1-5

Portugal 1-26

Italy 1-8

England 1-5

Argentina 1-7

Based on these odds above, their World rankings and historical performance's in the World Cup³⁶, I choose to defiantly go with Germany and Argentina. This left me a choice between the remaining four countries. Portugal was found to be to highly ranked pre-World Cup and thus reflected in the ranking, along with their historical performances at the World Cup, Portugal was eliminated. Italy's odds were deemed too low for the quality and age of their side, thus eliminated. Left with England and The Netherlands, it was decided to go for the higher ranked side (“safer investment”) and higher odds (higher return), compared to that of England, lower ranking and lower odds. All relevant teams deemed to have a realistic chance of winning the World Cup had now been analyzed and the most “appropriate” investment opportunities (teams) selected from the available choices.

³⁶ http://www.fifa.com/mm/document/fifafacts/mencompwc/01/18/03/18/fs_201_08a_fwc-alltimeranking.pdf

2. Combine the individual team payouts into the most efficient portfolio (*Combine the individual securities into an efficient investment portfolio.*).

There were now five selected teams that money was going to be placed on to win the World Cup. We would now need to look at the most efficient way to spread the capital available for investment (e300) to increase returns and minimize risk. With the selection of the sides (securities) below and their respective odds, we would now have to look at the optimal way to split the capital across the investments to a) mitigate as much risk as possible and, b) increase profits.

Spain 4-1

Brazil 5-1

Argentina 7-1

Germany 5-1

Netherlands 11-1

First we start by looking at how much one would have to invest in each side to get their initial wealth back, this is very simple and is simply: *Initial wealth/ odds*

Spain (e75), Brazil (e60), Netherlands (27, 27), Argentina (42, 88), Germany (33, 33)

Summing the above = e238, 48

This leaves e62 to then bet extra on one or more of the sides to ensure the making of some profit. Now the attention turns to looking at the options and seeing what would offer the best return in terms of the risk associated with it.

3. Choosing the spread of investment over the portfolio. (*Choose the investment portfolio*)

This is where it became tricky and I would have to use my perception more than anything else, and as portfolio theory had said, people have different forecasts. I thus decided, based on the following logic, that I'd choose to go for two teams instead of one (already an increased chance of returns) and, that I'd choose Brazil and The Netherlands.

- Brazil's record speaks for itself, as well as a very good team also have very good individuals, won the Confederations Cup in 2009. (were Spain “choked”).
- The Netherlands have star players all over the field, are a good side and their defensive problems will be mitigated by their brilliance in attack and team strength and have attractive odds.
- The other side's I decided weren't worth placing extra money on as Spain had “choked” before and never won the tournament and I thus thought the odds(return) were too low. I thought that the German side would be to young and thus not have the experience to match other sides and I thought that the qualification run and coach of Argentina was to questionable, especially with regards to their odds.

(The above will differ for all investors. This is where things like inside information and gut feel come into the question and this makes it very difficult to pin point exact steps that should be taken. Just as in the financial market, individuals should make this judgment based on what they feel is the most reliable and realistic information that they can find or is available to them. This will then obviously differ for most people, but choosing the “winners from the losers” is where we can't expect all investors to agree on all choices.)

I would thus bet/structure my portfolio as follows:

	Money bet	Odds	Stand alone Profit	Profit if win	ROI
Brazil	104,23	5	521,15	221,15	73,7%
Netherlands	46,46	11	511,06	211,06	70,4%
Spain	75	4	300	0	0%
Germany	33,33	9	300	0	0%
Argentina	42,88	7	300	0	0%

Table 4

I decided to split the remaining e62 to ensure that I would have round the 70% return if either side won and was amazed to see the effect of a little bit of simple diversification could have. Firstly my betting opportunities, it was now possible to bet on 5 sides and at least loose nothing while also having two investments that were extremely profitable if they won, were as before using the Portfolio theory I would have been limited to picking one winner and obviously only reap the returns this side offered.

Results

As the World Cup progressed I tracked the odds of all the sides that were still involved and was able to follow the progress of my sides, or investments. The World Cup through up many a surprise with major sides not progressing past the Pool Stages and the young Germany side playing the best football. In terms of how the portfolio developed, it developed quite well. By the semi-finals there were still 3 teams involved from the portfolio of sides and one would defiantly be in the final. This was a very interesting result, as due to the fact of being able to diversify, I now still had three bets running at the semi-final stage of the tournament. As I'm sure the reader will know, Spain went on to win the tournament and I received my e300 back in "winnings". For the portfolio theory application it was a success as there had been no losses incurred in return for the excitement and entertainment one gets from betting and I would probably not bet on Spain if I could only have chosen one side, a success all round in this sense.

We now need to look back and decide whether or not this proves anything at all and the relevance of it to the sport betting industry. I think that if we can acknowledge that such a simple thought process, led me, to develop a portfolio of bets that includes a lot of risk and uncertainty, that I was able to get my investment back. In this case it wasn't a complicated formula, but the basics of portfolio theory and security choice which led me to think in a manner that would in theory lead to less exposure to risk. For me this was evident immediately, being able to bet on two sides and had a chance of over 70% return on my investment.

When we look at the results though, we must, as always, approach the “success” of the practice with caution. The sports world is notoriously prone to “upsets” and even the most experienced and knowledgeable sports experts, get results wrong. There will most certainly be ways to improve, or even complicate, the application of portfolio theory for sports betting. Whether this is necessary is then another question as improvements might lie in the simultaneous application of some other economic theory with portfolio theory, this will need to be looked at. For people with relatively little knowledge about the sport they’d like to bet on, perhaps this is the beginning of a simple process which many people would never come to think of using and thus, achieves its goals in helping minimize exposure to risk in the betting world.

With my personal experience and looking at what other firms have started/have been to offer/ing the betting public, there is significant evidence to show that economic theory has a place in the sports world and that applying even the most simple of principles can lead to increased overall return.

Conclusion

The sport world has been going through a major change in the past three decades with the professionalization of sports, some even as recently as 1996(Rugby). What this then perhaps says is that the amounts of money that we have seen involved in (all) sports is new, the same can then perhaps be said about the sports betting industry as well.

We have seen that concepts and innovations of the betting industry have all had a massive influence on the industry; the internet seems to be that next step and a big one. The internet has added a new dimension to sports betting and the industry has started to embrace it. With betting exchanges now starting to become more and more common, as well as the ease at which people can place bets, we are looking at a massive market which will see huge influx in the flows of income.

The way we are now going to approach handling the betting market, the way we go about placing our bets and the way we view the market will also need to adapt to ensure positive returns. It then seems logical that if this accelerated likeness between the financial and sports markets becomes apparent, that we need to start applying economic theory to the sports market. I understand that the theory might not all be relevant for each “likewise” situation, but understanding the theory’s and being able to identifying what can fully/or partly be applied to the way we place our bets. I feel that due to the relatively short time span that so much money has been involved in sports and the idea that it’s a totally un-correlated market with all other markets, that academic interest will awaken to start to address the in-efficiencies of the betting market and look at return increasing strategies specific to sports betting.

I see the future of sports betting as one that is very similar to that of our financial markets. I could imagine that after particular attention to the best way to place bets that a lot of people will diversify their portfolios with sports bets due to the un-correlated risk aversion it offers. I could imagine that these markets will also be affected heavily by “Black Swans” and that when Spain lost to Switzerland in their opening game that the betting exchange had a lot of people offering “attractive odds” for Spain still to win. I could then imagine that at some point that we could even see sports “rigging”, not by paying players/referees, but by influencing the supply and

demand of certain bets on the exchange, who knows, perhaps at some point we'd see heavy regulatory control of these markets.

If these systems are heading for this kind of operation and even, complexity, I really feel that not only will economic thought help/improve the betting market but also be essential for it.

Bibliography

Andreff W, Szymanski S, *The Handbook on the economics of sport*, Elgar original Reference, 2006

Ates C, *Behavioral finance and sports betting*, Aarhus School of Business, June 2004.

Dobson S, Goddard J, *The economics of football*, Cambridge University Press, Cambridge, 2001.

Gladwell M, *blink: the power of thinking without thinking*, Back Bay Books, New York, 2007.

Groot L, *Economic Uncertainty and European Football: Trends in Competitive balance*, New Horizons in the Economics of sport series, Edward Elgar publishing Limited, Cheltenham, 2008.

Hoehn T, Szymanski S, *The Americanization of European football*, Blackwell Publishing, April 1999.

Koning R, Kesenne S, Garcia J, *Governance and Competition in professional sports*, Ediciones de la Universidad de Oviedo, 2008.

Michie J, Oughton C, *Competitive Balance in Football: Trends and Effects*, The Sports Nexus, 2004.

Morrow S, *The people's game: football, finance and society*, Palgrave, 2005.

Taleb, N, *The Black Swan: The Impact of the Highly Improbable*, Random House, New York, 2007

van der Assem et al, *Finance 1: 1st Edition*, Rhobeta consultants, Leidschendam, 2007.

Argraval A, Taleb blames portfolio theory, Markowitz defends it, Mostly Economics, 11

December 2008 (10/08/10)

< <http://mostlyeconomics.wordpress.com/2008/12/11/taleb-blames-portfolio-theory-markowitz-defends-it/>>

Dr. Bob's Sports, An Investment in sports, 2009, (08/08/10)

< <http://drbobsports.com/essays.cfm?cat=0>>

Federation Internationale de Football Association (FIFA), (31/08/2010)

<<http://www.fifa.com/aboutfifa/documentlibrary/doclists/matches.html>>

<<http://www.fifa.com/worldfootball/ranking/lastranking/gender=m/fullranking.html#confederation=0&rank=193>>

<http://www.fifa.com/mm/document/fifafacts/misc-tele/52/01/27/fs-401_05a_fwc-tv-stats.pdf>

<<http://www.fifa.com/aboutfifa/documentlibrary/index.html>>

<<http://www.fifa.com/aboutfifa/marketing/factsfigures/tvdata.html>>

<http://www.fifa.com/mm/document/fifafacts/mencompwc/01/18/03/18/fs_201_08a_fwc-alltimeranking.pdf>

Gambling Commission, Industry Statistics 2008/9, Birmingham, Oct. 2009, (31/08/10)

<<http://www.gamblingcommission.gov.uk/pdf/Gambling%20Industry%20Statistics%202008%202009%20-%20update%20-%20October%202009.pdf> >

Isidore C, *Don't bet against online gambling*, CNNmoney, 26 March 2004, (04/08/10)

<http://money.cnn.com/2004/03/26/commentary/column_sportsbiz/sportsbiz/>

Martin J, *History of sports betting*, (22/06/10)

<<http://www.ultimatecapper.com/history-of-sports-betting.htm>>

O'Connor N, *Betting market: Trading without dark pools*, Niall O'Connor, 2009 (27/07/10)

<<http://www.bettingmarket.com/refraichir010388.htm>>

Sports Insights, *Sports betting Systems*, 2010, (08/08/10)

<<http://www.sportsinsights.com/sports-betting-systems.aspx>>

Summers C, *How does a betting exchange work*, BBC News, 07 December 2007 (27/07/10)

Wikimedia Foundation Inc., <www.wikipedia.org> (31/08/10)

Searches for the following topics: *Betting exchange, modern portfolio theory, portfolio theory, sports betting, sports odds*.

Appendix

Figure 1: A simple illustration of a betting exchange³⁷

• TRADITIONAL BETTING



High Street bookmaker offers odds of 3-1
Punter Jim places a £1 bet on at 3-1
If he wins Jim gets a total of £4 (£3 plus his £1 stake back)

BETTING EXCHANGE



Jim thinks Tottenham will win against Arsenal and is prepared to bet £1
Steve thinks Tottenham will lose and offers odds of 4.0 (3-1). He is effectively risking £4
Betfair automatically matches punters who want to strike a wager. Jim's bet is accepted and matched with Steve's bet
Whoever wins, money is transferred from one account to the other. Betfair earns commission from the winner's takings

³⁷ BBC News, How does the betting exchange work, C. Summers, Dec 2007

Figure 2: A pick of Dr. Bob's results³⁸

Football / Basketball Combo Package

1999-00	+162.6%
2000-01	+140.2%
2001-02	+165.2%
2002-03	-49.7%
2003-04	+62.9%
2004-05	+81.6%
2005-06	+210.7%
2006-07	-1.1%
2007-08	-77.4%
2008-09	+34.8%
2009-10	+50.1%
Average	+70.9%

Basketball

In Basketball, averaged a 53% ROI with a standard deviation of 90.3%.

1999-00	+91.8%
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³⁸ <http://drbobsports.com/pastperformance.cfm>

2000-01	+43.1%
2001-02	+155.1%
2002-03	-81.8%
2003-04	+199.1%
2004-05	-13.4%
2005-06	+168%
2006-07	-9.8%
2007-08	-16.2%
2008-09	-7.4%
2009-10	+53.3%
Average	+52.9%

These returns are all well in excess of what you can earn in any conventional financial market, with Sharpe Ratios (which describe risk-adjusted return) almost double that of the S&P 500.

Appendix: Figure 3 Pre World Cup Rankings³⁹

Last Updated 26 May 2010

Next Release 14 Jul 2010

Ranking	Team	Pts May 10	+/- Ranking Apr 10	+/- Pts Apr 10
1	Brazil	1611	0	0
2	Spain	1565	0	0
3	Portugal	1249	0	0
4	Netherlands	1231	0	10
5	Italy	1184	0	0
6	Germany	1082	0	-25
7	Argentina	1076	0	-8
8	England	1068	0	0
9	France	1044	1	0
10	Croatia	1041	-1	-11
11	Russia	1015	0	12
12	Egypt	967	1	0
13	Greece	964	-1	-4
14	USA	957	0	7
15	Serbia	947	1	3
16	Uruguay	899	2	-3

³⁹ <http://www.fifa.com/worldfootball/ranking/lastranking/gender=m/fullranking.html#confederation=0&rank=193>

Ranking	Team	Pts May 10	+/- Ranking Apr 10	+/- Pts Apr 10
17	 Mexico	895	0	
18	 Chile	888	-3	
19	 Cameroon	887	0	
20	 Australia	886	0	