The Sport-Relations Investment Fund – Investing in the sport network

Supervisor: Associate Professor Troels Troelsen

Department of Operations Management, CBS

Cand. merc. AEF

Master's Thesis

Copenhagen Business School 2015

Hand-in date: 26-08-2015

Number of characters: 232,870

Number of pages: 118

Date:_____

_____

Joachim Dissing Andersen

Date:_____

_____

Christian Jonas Flygenring

Contribution

This thesis would not have been finished without the help from a number of people. Therefore, we would like to officially thank them.

- Thanks, to our supervisor Troels Troelsen for introducing us to the idea and telling us his honest opinion throughout the project.

- Thanks, to Olav Skaaning Andersen and Denys Lund for taking the time to talk to us and giving us industry insights crucial to this thesis.

- Thanks, to Liv Kromann Reich and Jens Peter Andersen for reading through our thesis, cleaning up the language and shedding light on the mistakes we were too close to see.

- Lastly, Thanks, to friends and family who frequently have shown their interest in our project, which gave us the energy to finish it.

Christian Jonas Flygenring and Joachim Dissing Andersen

1.0 Abstract

This thesis analyzes the competitiveness of a Sport-Relations Investment Fund (SRIF) compared to top tier benchmark funds. The results show that 9 out of 10 SRIF portfolios are very competitive and 6 out of 10 portfolios show higher Sharpe ratios than any of the benchmarks during the period May 2013 to May 2015.

The 85 assets comprising the SRIF portfolios were found in the sport network. All assets were selected based on our sports defining criteria and individual industry restrictions. This stock universe includes companies within sport apparel/equipment, sports betting, broadcasting, sport clubs etc. This broad range of companies has experienced tremendous growth during the last decade, a growth we will try to exploit through investment in the network.
The sport network is characterized by its strong interdependency and loyalty, which makes it a robust investment, even during economic downturns. The growth in the sport network is a result of the great passion from fans, which has boosted revenue to such an extent that record breaking deals are realized in many parts of the network. The crucial question is therefore why no investment bank has created such a fund yet. Through our analysis we conclude that the unprofitability of sport clubs unfairly has given the sport network an economically bad reputation.

In order to optimize the asset allocation process of SRIF, portfolio theory is applied. This includes the main concepts of Modern Portfolio theory, Post-Modern Portfolio theory and the Black-Litterman model. We create 10 SRIF portfolios based on a three year data period dating from May 2010 to May 2013, all complying with the restrictions of the European Union's legislative framework. The 10 portfolios are evaluated based on a two year holding period dating from May 2013 to May 2015, and their performance is compared to 6 benchmark funds that all have a Morningstar rating of 4 or 5 stars.

The results of our analysis show that the SRIF portfolios to a great extend outperform the 6 benchmark funds. The SRIF portfolios combine high returns with low standard deviation, providing investors with beneficial Sharpe ratios. It is indisputable that a SRIF portfolio would have been a very profitable investment during the last two years.
Therefore, we conclude that a Sport-Relations Investment Fund should strongly be considered as a viable investment option, not only in Denmark, but on a global scale.

Table of Contents

Table of Figures

2.0 Introduction

The sporting industry has seen tremendous transformation during the course of the previous century and has continued during the beginning of the current. From the beginning of the 20th century when the first organized sport clubs and the popular games that we know from today were formed, through the mid-century introduction of truly professional athletes and the late century idolization of the biggest sports stars, the sporting industry has simply become bigger and bigger. With this increase in popularity more and more money has flown through teams and clubs and often ending in the pockets of athletes. Especially the major sports and sports well-suited for TV, the most crucial aspect of increasing the monetary compensation, have realized exponential revenue growth, making athletes millionaires and sport big business. At the same time, smaller sports (revenue wise), like sailing, table tennis, badminton, gymnastics etc. have all gotten more interest through better staging of events, like the Olympics or the newly established European Games. This has created a fierce competitiveness between the different sports, for members, TV popularity and sponsors etc., which for example have led the Badminton World Federation to change the point system to make it more TV-viewer friendly and the Fédération Internationale de Volleyball to dictate the female beach volley athletes to wear bikinis during competition.
Whether this approach is ethically correct is outside the scope of this thesis, but it sheds some light of the measures that sport policy makers are willing to change in order to increase popularity for their respective sport.

All this popularity, interest and in the end great revenue streams have naturally attracted a great variety of companies that all want a piece of the cake. Sporty clothing companies like Nike, Adidas, and Puma etc. are well known and their ties to the sporting industry are obvious. Other companies like betting companies (Unibet, Ladbrokes and BWIN etc.) broadcasters (CBS, Comcast and SKY etc.), agencies, sports equipment manufacturers, stadium operators, nutrition companies and many more have all tried to capture their share of this growing industry. Their connection with the sporting industry may not be as obvious, but they are a definite part of the sporting network.

The enormous amount of revenue created within the sport network is of natural interest to the world of finance. The stock market has ever since its introduction around the 1600's been a place of risk balancing in connection to possible reward. In today's world, the stock markets are highly professional and computers can with ease calculate past returns, correlations with other stocks, and expected risk. There is however no computer yet that have been able to foresee the future and the

complexity of today's stock markets have thus made investors use mutual funds to spread their risk across a number of different stocks. A mutual fund is a portfolio of stocks put together from some mathematical measure in order to maximize expected return and minimize potential risk. These mutual funds are seen in great variety; some try to replicate an index, and others have a general theme as healthcare, environment or growth stocks etc.

This leads us to the idea of combining the growing sport industry with the popularity for mutual funds. We will through this thesis investigate whether a mutual fund created from the earlier mentioned industries can produce competitive past returns compared to risk. This will be done through analyses of relevant market data, economic outlook for the given industries and portfolio theory. We believe that a Sport-Relations Investment Fund (SRIF) have been neglected because of sport clubs are notorious for their overspending, thus creating a general awareness of the industry as non-profitable. This notion may be true, but we believe the overall sport network to be profitable for possible investors.

2.1 Problem Statement

Based on the beliefs described in the introduction, our problem statement will be:

Can a mutual fund consisting of stocks from the sports network compete with established Morningstar mutual funds?

To answer our problem statement we will through this thesis answer the following questions:

- Is there an opportunity in the market to create such a fund?
- What characterizes the loyalty and the unique network structure within the sports industry?
- How is a sports network asset defined?
- How does the future look for the key industries in the sports network?
- What suggestions do modern portfolio theories give concerning asset allocation?
- If the mutual fund proves to be competitive, why has it not been created yet?

2.2 Delimitation

This thesis will take the aim of proving our problem statement of a competitive sport network mutual fund. The mutual fund was chosen over other opportunities due to its easy comparability with other mutual funds, making private equity investment consideration irrelevant to this thesis. There are numerous approaches to assess whether a mutual fund is profitable for the individual investor. These include tax analysis, legislative landscape between different regional zones, and economic outlook for all global regions. Furthermore, the amount of asset allocation tools is vastly extensive, but they all have the same aim of maximizing future expected return and minimize risk.

Starting with the question of taxes, there would be a great many ways to grasp such an analysis. Tax brackets and legislative framework differ greatly across different regions, making an analysis of where to allocate SRIF based on taxes outside the scope of this thesis. Additionally, there are the tax considerations of the individual investor, which would further complicate the analysis. Here, there are an extensive number of different legislative frameworks in place, which are dependent on the current financial situation of the individual investor. An extensive tax analysis would as such include both the optimal place of setting up SRIF and where the individual investors should invest from. Such analysis is futile for the overall problem statement and is thus not included in this thesis.

Moving on to the legislative framework for SRIF there are specific rules and regulations for how to set up a mutual fund. This includes how to manage it, maximum weights in different asset classes, and responsibility to the investors etc. This thesis has chosen to locate SRIF in Denmark and is as such subject to European Union mutual fund legislation (UCITS). Therefore, the thesis will only be concerned with the regulations inside the EU. This thesis will have a theoretic scope and as such solely look at the legislative limitations for creating SRIF, not how to manage it (in terms of board structure or legal assistance needed).

When evaluating stocks and their relevance to SRIF, the vast majority of assets identified are from the more recognized stock exchanges, hereunder the North American, European, Oceanic (including Hong Kong) and Japanese stock exchanges. This has been done due to the easier access to data and the greater dependability of these stock exchanges. Our main focus is the western market since 76% of global sport-related revenue is in North America and Europe-Africa (PwC, 2011). There is however great potential in other parts of the world, highlighted by the fact that the fastest growing global region is South America, suggesting that future profitability is a possibility, and that SRIF could include assets from the whole global spectrum.

Moving on to the assumption of sports fans as consumers. We believe that if we see a rise in economic compensation for players within a certain type of sport, it is because sponsors, broadcasters or other stakeholders have decided to increase their financial commitment within this given sport because of increased consumer attention. Similarly, we believe that an increase in overall revenue for the sports equipment or sports betting industry is also due to an increase in consumer attention. Therefore, we take the general financial growth within the sports industry as an indication of growth in consumer interest for this industry. We have as such not given any attention to the question of whether additional spending or increase in the total number of sports fans is the main driver of this revenue growth. This is because mutual funds are assessed based on their performance, not whether the companies included in the fund are able to attract new customers or make existing ones spend more.

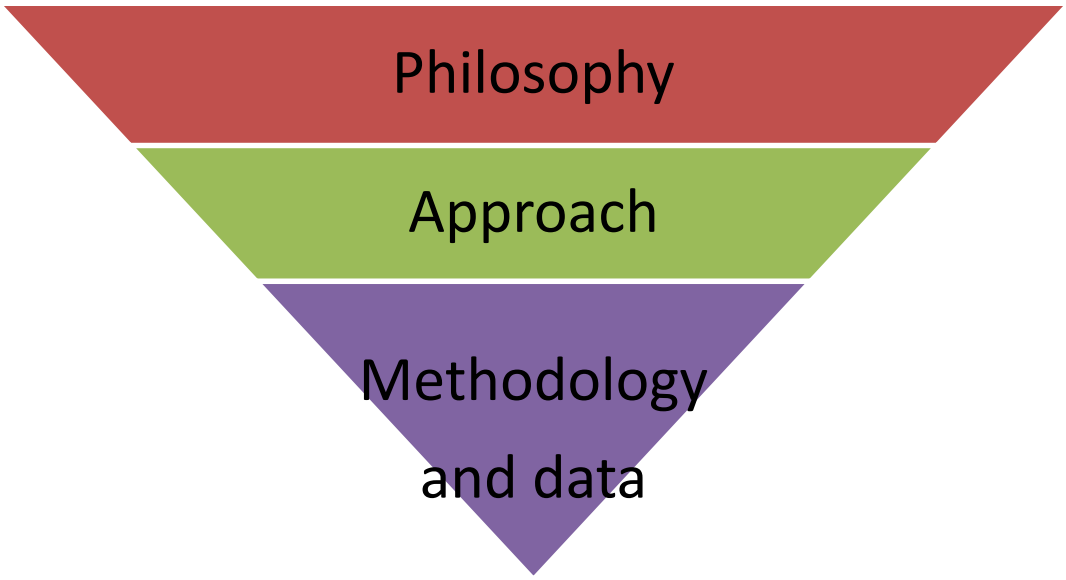
Finally, this thesis will include a couple of different methods of asset allocation in regards to optimizing a portfolio. Portfolios will be based on modern- and postmodern portfolio theory together with the Black-Litterman asset allocation model. These concepts will, together with industry analyses, comprise the backbone of this thesis.
It will however not include an extensive analysis and comparison of the different asset allocation methods, both in terms of theoretic approach and financial performance, as that would comprise a paper itself. The aim of the thesis is to assess whether SRIF is a generally good idea and concept, not to evaluate which asset allocation model is the most profitable.

3.0 Theory of science

Before the actual problem statement can be looked upon it is important to describe how science is perceived. What is meant is that one cannot claim to be solving a problem via experiments and theory without first establishing what constitutes as science. Many fields such as finance, physics, and mathematics etc. are dominated by certain theories and paradigms which have been developed through decades and centuries. But what makes a certain theory reliable? How can observations of a problem be used to reject or confirm a certain theory? Is there by default anything that can be viewed as absolutely true? These are all questions which are being asked by theoreticians and philosophers of science. Different philosophies within science have different views of what constitutes as reliable theories and correct observations.

Therefore, before actually applying theory to a problem, this thesis must describe which research *philosophy* it operates within. When this is established, then one can look at how the actual problem of the thesis will be *approached* through the application of theories. These two steps will be carried out in the following section. However, the last step, the methodology and data collection, will not be touched upon in this section, but will be described for each individual section of the thesis where it is seen fit. This is done in order for this thesis to be more transparent and to keep each methodology section more precise to the subject it is exploring. The scientific method will be carried out in the order shown on Figure 1.

Figure 1 - Scientific method



3.1 Research Philosophy

It is argued in this section that when trying to prove a hypothesis or theory within the field of finance, researchers are mainly influenced by three main philosophies of science (Ryan, et al., 2002):

1. Empiricism
2. Logical Positivism and Instrumentalism
3. Lakatosian Research Methodology

Research is basically summed up to a discovery, interpretation and communication of new knowledge. The irony of this being that there still is a vast discussion of knowledge itself (Chalmers, 2011). The last 50 years have seen an increasing attention to methodology within Finance and the three philosophies above are central to the discussion. They will each be reviewed and lastly their relevance to this thesis discussed.

3.1.1 Empiricism

In order to best understand empiricism it is helpful to briefly look at one of its philosophical predecessors, *Rationalism*. Rationalism takes its original form from the teaching methods of Socrates and his pupil Plato. They argue that there exist abstract forms of knowledge, especially the form of justified true belief. This implies that there are certain things that need not to be observed before they can be perceived as true; rather they can be rationalized within oneself. Plato made the assumption that true beliefs are only accessible through reasoning and that all knowledge is innate (Ryan, et al., 2002).

From this belief, a counter philosophy by Aristoteles emerged (Ryan, et al., 2002). Aristoteles believed that humans gathered knowledge through observation and categorization meaning that through repeated observations of events we begin to understand the properties of something. Using a market as an example if we observe the same observation repeatedly an understanding of the market begins and from there logical extensions can be made. This is the belief on which empiricism developed through the 17-19th century most notably by Isaac Newton who used empiricism as a scientific method (Chalmers, 2011) (Ryan, et al., 2002). The modern followers of empiricism will generally agree that the notion of experience as the only source to knowledge is unrealistic, but they argue that experience can be used to justify our beliefs of what we know (Ryan,

et al., 2002). There are three major points of certainty and belief that classic empiricism accepts (Chalmers, 2011) (Ryan, et al., 2002):

1. Certainty of belief in what we know can only be approached through perception.
2. All knowledge is derived from perception through our senses.
3. Statements are either true or false because of the way the world is or because of some formal properties of the language we use.

From the above, the following two conclusions on empiricism can be made: First, the beliefs that are not derived through experience/perception or logically derived implications of experience are meaningless. Second, beliefs cannot be based on reasoning alone; rather science should have no beliefs or values but purely be based on observations and experience.

3.1.2 Logical positivism and Instrumentalism

From the quite extreme case of empiricism a philosophy called logical positivism was derived in the 1920's by the Vienna circle of Philosophers (Ryan, et al., 2002). Logical positivism argues, just like empiricism, that true belief stems from what we can perceive and that these perceptions come from a value-free reality (Chalmers, 2011). Furthermore, logical positivism argues that all meaningful statements must theoretically be verifiable through observations. This leads us to an issue of logical positivism that must be addressed; the verification principle in relation to general laws and theoretical terms.

The verification principle implies that all true beliefs can be verified. This is however an issue for logical positivists. Many scientific laws are tried to be universally generalized in order to make them definitely established. The problem that arises is that it is impossible to test all instances of these laws and thus general laws fail to hold up against the verification principle (Chalmers, 2011). Theoretical terms suffer from the same issue as general laws as theoretical terms are often so vague that they become impossible to verify through experience. Ryan et. al. (2002) use the term "value" as an example. Most people think they have an idea of what value means, but when attempting to define it through observational means, it becomes difficult to determine what value is. Many of the economic researchers of the last half of the 20th century faced these problems and this led to the creation of *Instrumentalism* (Ryan, et al., 2002).

Instrumentalism, at least in relation to economic research, was broadly introduced in 1953 by Milton Friedman (Ryan, et al., 2002) and offers a philosophy less strict than empiricism and logical positivism when it comes to the theory applied. Instrumentalism views theories as convenient tools to make observational predictions. The purpose of theories for Instrumentalists is to be able to make predictions that can be verified. Whether or not the theories are universally applicable is irrelevant as long as they work in practice. If a theory does not hold up they can be replaced when a more suitable alternative is available (Ryan, et al., 2002). This philosophical approach is very enticing for researcher of economics, since it does not matter if the theories are unreal as long as they are able to verify the predictions made.

3.1.3 Lakatosian research methodology

In 1970 Imre Lakatos introduced his methodology concerning research programs and this philosophy/methodology has been widely used ever since (Chalmers, 2011). Lakatos' methodology offers guidance on how to test a hypothesis or theory in relation to the already established network of theories. An established network of theories is by Lakatos referred to as a Research program and contains *the hard core* and a *protective belt* (Chalmers, 2011). The hard core of a research program is the fundamental principles of the program and these cannot be changed if one is to expand on an existing research program. The protective belt is a set of supplementary assumptions and theories which assists the underlying hard core in order to make definite predictions (Chalmers, 2011). If a new hypothesis derived from a research program does not hold up, it must be one or more assumptions in the protective belt that is false, it cannot be the core of the program (Ryan, et al., 2002). If the point of departure of a new hypothesis is contrary to the core, then this hypothesis is not included in the research program as it violates the principles of the science.

In relation to this, Lakatos created guidelines on how to work within a research program by using negative and positive heuristic (Chalmers, 2011). Negative heuristic specifies advice to the scientist on what not to do and, conversely, the positive heuristic gives advice on what to do. The negative heuristic are often quite simple since the general advice is to not change part of the hard core. If this occurs then the scientist has effectively opted out of the research program (Chalmers, 2011). It is a bit more complex with the positive heuristic as the advice is more abstract. A general advice is to implement new theory and hypotheses to the already existing hardcore in order to make new predictions and expand on the research program. It is important to note that the Lakatosian

methodology acknowledges that all hypotheses are created based on existing programs and theory and therefore all new knowledge is a result of past belief (Ryan, et al., 2002). This is not to say that new hypotheses cannot revolutionize a research program, but it is vital to Lakatosian methodology that past theory and experience is acknowledged as influential (Chalmers, 2011).

3.1.4 Philosophy and approach of this thesis

The research philosophy of this thesis is deeply rooted in all three reviewed philosophies. Empiricism may not be directly applicable since the notion that no theory is behind our hypothesis and that we are simply basing our belief through observation is untenable. However, observation and experience, which are two of the most coveted aspects of many financial papers, especially when dealing with portfolio optimization, originates from empiricism and thus have an impact on the philosophy and approach of this thesis.

This thesis will try to prove that it is possible to create a portfolio with stocks only related to sport that is able to compete with other comparable mutual funds. As such, we act in the mold of logical positivist and as instrumentalist since we will use acknowledged theories within network theory, sports theory and portfolio theory in order to carry out own observations of data. The fact that much Modern – and Post-Modern Portfolio theory cannot be proven on all instances is beside the point, since it is only important that it can be used to test out our hypothesis.

We will heavily base our thesis on Lakatosian Methodology as we are following the research program which can be traced back to Harry Markowitz in 1952 when he first introduced Modern Portfolio Theory (Markowitz, 1952). Therefore, Modern and – Post-Modern Portfolio Theory will serve as the hard core of our research program. The protective belt will be filled with theories within social networks, economics and newer portfolio theory. We therefore acknowledge that our hypothesis is deeply affected by past work within these fields, but this must be considered the norm when working within the field of Finance. It would be unrealistic, and arrogant, to assume that we could write a thesis on the creation of a mutual fund without including the theories on the subject which have been developed over the past 60 years.

In relation to the Lakatosian Methodology the negative heuristic of this thesis is based around the hard core of the research program. We will not change the theories and approach of Modern and Post-Modern Portfolio theory. Instead, we accept the theories as valid and apply them directly to

our own hypothesis. In terms of the positive heuristic we will apply the theories used to describe the network of sports with portfolio theory in order to best create a thesis that validly can claim the belief that a sport-related fund can be competitive.

The section above describes the philosophy and approach of this thesis. No discussion of our actual methodology and data has been done in this section, as it will be carried out separately for each part of the thesis. This is done because the approach towards network theory, sports economics theory, mutual funds, and portfolio theory all vastly differ. As such, it would be too complex, and tiresome for the reader, to discuss the methodology and data of all subjects in one section.

3.2 Research purpose

In terms of research purpose there are generally three approaches undertaken in order to add value to a research program: Exploratory research, Explanatory research and Descriptive research (Ryan, et al., 2002).

- Exploratory research is done in order to search for new knowledge within an already established research program or to assess an event with a new approach.
- Explanatory research is done in order to explain the connections between different subjects or variables within a certain theory. Furthermore, research done in order to explain the influence of one specific variable on the remaining variables of a subject is also considered explanatory.
- Descriptive research is done in order to describe a certain subject or event. It is important to note that descriptive research does not explain the reasons of the event or the variables of a subject; it only looks to portray the occurred event.

The purpose of this thesis is *exploratory* as the purpose is to attain new knowledge about the investment universe of a mutual fund and its possible combination with the sports network. Furthermore, we aim to expand the insight concerning SRIF by renewing the data period and increase the amount of investable assets.
It is also believed that the thesis has an *explanatory* purpose as the research also aims to study the influence and behavior of the various actors in a sports network and analyze how these affect each other. Moreover, the thesis looks to explain the influence of a strongly tied network and how this may affect the performance of the stock universe.

4.0 Mutual fund aspects

The following section will comprise the legal framework for mutual funds together with an analysis of the cost structure of such funds. It will also include a discussion concerning the difference between active and passive portfolios and in which category we see the best fit for SRIF. Lastly there will be a brief discussion of the benefits and drawbacks of investing in SRIF.

4.01 – Methodology and data

The information sources used in the analysis of the legislative framework of a mutual fund have been retrieved from the Danish government (Finanstilsynet). It consists of the latest UCITS directive which is the European Union's legislative body concerning investment fund regulations. The validity and reliability of this data must be considered as highly credible.

The discussion concerning the active/passive portfolio mutual fund has been conducted using economic articles and journals which describe how the market generally defines an active or passive portfolio. It is believed that the sources are reliable since they have been done by multiple academic scholars all arriving at the same conclusions.

Lastly, the section concerning cost of a mutual fund has been influenced by cost data from the latest Morningstar investor report. The reliability of this cost data has not been questioned due to Morningstar's reputation. The cost analysis could however have been done in a number of different ways, but by choosing the Morningstar data we attain universally approved numbers.

4.1 Mutual Fund consideration

4.1.1 Legislation

This section of the thesis will highlight and discuss the legislation concerning the creation, maintenance and rules of a mutual Fund. The legislation acts as a legal framework and has influential power over many aspects of the fund. Especially the combination of assets within the fund is heavily influenced by the legislative rules, and, as a consequence, will receive the most attention. Other, more general, legislative consequences for the mutual fund will also be highlighted.

4.1.1.1 UCITS

The EU created the UCITS directive in order to provide and encourage more cross-border transactions and to ensure a more transparent playing field for the mutual funds within the EU. The first directive was introduced in 1985 and the latest changes occurred in 2009. In Denmark it is *Finanstilsynet* who oversees that the UCITS legislation is being followed. National legislation concerning mutual funds also exists in Denmark and is referred to as LIS. The UCITS and LIS legislation are combined in "Lov om Investeringsforeninger" (Erhvervs - og Vækstministeriet/Finanstilsynet, 2013) and references to the two will therefore be from the same reference.

There are two areas of mutual fund legislation key to this thesis; General legislation of a mutual fund and legislation concerning the possible assets of a mutual fund. Obviously, the legislation of a mutual fund is much more comprehensive than what is highlighted in this thesis. The paragraphs referred to in the following section will be paraphrased and their entire length will be viewable in appendix H.

General legislation for a mutual fund

In terms of creating the mutual fund, § 3 (Erhvervs - og Vækstministeriet/Finanstilsynet, 2013) states that the fund must be approved by Finanstilsynet and that it must function as a master or feeder institute. A master institute is a fund that does not invest in other funds, whereas a feeder institute can invest in other mutual funds as part of their strategy. The SRIF will solely invest in equity/stocks and not in other funds and will therefore be subject to the rules concerning a master institute.

This implies that SRIF is allowed to have other mutual funds as investors, but that SRIF itself must only invest in stocks. § 3(10) (Erhvervs - og Vækstministeriet/Finanstilsynet, 2013) also states that the fund must have at least 10 million DKK in capital at all times. This obviously requires that SRIF has raised 10 million in investable capital before the fund can be created.

Following as an extension to this rule is the fact that the mutual fund is not liable for the invested capital, meaning that any losses will not be redeemed to the investors. This is further cemented by § 68 which forbids the fund from raising any loans. This rule can only be breached if the mutual fund

is taking a short loan in order to payout an investor's invested capital. Since loans are not an option, the capital raised must come from the public (private investors) or other funds.

Regarding the location of the mutual fund the actual administration of the fund must take place in Denmark and this is detailed by § 2(5) (Erhvervs - og Vækstministeriet/Finanstilsynet, 2013). However, the fund can be marketed and sold in all countries that are part of the UCITS, detailed by § 2(6). This is important to SRIF because this allows the fund to be located in Denmark whilst still attracting investors from the rest of the EU.

The general rules reviewed have highlighted the legislation concerning how the fund must only invest in stocks and the placement and marketing rules of a mutual fund. How the invested capital legally can be attained has also been reviewed. The vital legislation for this thesis is the legislative rules concerning the investment universe of the fund which will now be reviewed.

Legislation concerning the possible assets of the mutual fund

Since it has already been established that SRIF will only invest in stocks, the attention of this section will be directed towards the paragraphs which specifically influence how the capital in SRIF can be invested. § 139(1) permits a mutual fund to invest in all regulated markets, which can be translated to all public stock exchanges. This is important because this implies that even though the fund is located in Denmark the SRIF is allowed to invest in all global stocks as long as they are publicly traded on a regulated market such as NYSE or London Stock Exchange.

One of the main goals for a mutual fund is to offer a diversified investment universe for its investors. This is through UCITS legislation highlighted by § 147 which is known as the 5-10-40 rule (Erhvervs - og Vækstministeriet/Finanstilsynet, 2013). This rule concerns how much of the fund capital that can be invested in each stock. § 147 states that a mutual fund can invest a maximum of 5% of its capital in one stock. However, this percentage can be expanded to 10% as long as all assets above the 5% threshold do not combine for more than 40% of the total capital of the fund. This ensures that a mutual fund must invest in a minimum of 16 stocks and thus should be protected against significant losses through diversification.

Following as an extension to § 147 is § 157 which prohibits a mutual fund from owning a significant amount of shares with voting rights within a specific stock (Erhvervs - og Vækstministeriet/Finanstilsynet, 2013). This rule is implemented to ensure that a mutual fund does

not take control of a stock by having the majority of the voting rights. This is due to the fact that a mutual fund, solely invests in company without the intension of interfering with the daily running of said company. Furthermore, § 157(1) forbids a mutual fund from owning more than 10% of the total shares of one single stock. This is also a measure taken in order to ensure that mutual funds solely act as passive investors (Erhvervs - og Vækstministeriet/Finanstilsynet, 2013).

4.2 Active vs. passive mutual funds

When considering the components that need to be in place in terms of the actual running of a mutual fund, it is imperative to discuss the "active or passive mutual fund" question. When referring to an active or passive mutual fund, it is the actual management of the mutual fund that is in question. Should the fund be fixed and duplicating an existing index as the Dow Jones or S&P 500 (passive) or should managers be able to change the composition of the portfolio in order to find market imperfections whenever they see fit (active)? This section will look at the potential up- and downside with either option, and will also discuss the recent trend of combining the two strategies (Kern, 2014). The latter part of the section will describe the reasoning behind the characterization of our portfolio and will feature a cost analysis of SRIF.

4.2.1 Passive investment funds

A passive investment fund is characterized as a fund where the asset allocation is mimicking that of an already existing index. This is done in an effort to create a portfolio as close to a "market portfolio" as possible (Arnerich Massena & Associates, Inc., 2007). A passive fund is also referred to as indexing, as this strategy does not set out to beat the market per se, but rather to duplicate the trends of a broad index. Of course it cannot be said that a passive fund completely follows the market as it is impossible for any realistic index to actually contain the entire market, but an index as the S&P 500 is arguably the closest one can get.

There are quite a few economic theories that support the use of the passive strategy; in this section the three most influential will be mentioned. These are: The efficient-market hypothesis, The Long-Term average cost function, and lastly The Principal-Agency problem (Sharpe, 1991).

The efficient-market hypothesis proclaims that all obtainable information regarding the market is already reflected in the stock prices and, even if some information were not reflected, it would be impossible for someone to exploit this information. This theory must be considered the most influential to the passive strategy as it clearly states that there is no incentive in trying to actively beat the market, since no manager should have any information or insight that is not known to the market (Sharpe, 1991).

The long-term average cost is not in itself a theoretic concept but rather a set of functions that must hold true if one believes in the average market (Sharpe, 1991). In brief, the theory is that the average return of every active investment fund will equal the return of every passive investment fund, before costs that is. However, since the average cost of an actively managed fund is higher than the average passive fund, it must be true that the realized return after costs is higher in the average passive investment funds (Sharpe, 1991).

Lastly, is the Principal-Agency problem (Bodie, et al., 2011). Here, the subject of attention is the incentives of the controlling manager of the portfolio. An investor will only use the help of a portfolio manager if he is convinced that the manager is fully interested in achieving the highest possible return for the portfolio. But how can the investor be sure that the manager is looking to optimize the portfolio and not just maximizing his own wealth? This is usually done through incentives (Bodie, et al., 2011). The biggest incentive for the manager is probably the threat of being fired if he underperforms. However, if the investor continuously has to switch managers due to underperforming portfolios this will drive his costs significantly up. Often, the manager receives a share of the portfolio profit as his compensation. This gives the manager incentives to fully focus on maximizing the portfolio returns, as his compensation will follow the performance of the investor's portfolio. Although, this may ensure that the manager will do everything in his power to maximize the investor's return, it still does not guarantee that he will be successful in doing so. And this is the case that supporters of the passive strategy try to emphasize. Why spend additional capital and time trying to incentivize a manager if the average manager is as successful as the average passive fund and offer no guarantee of a larger return?

These three arguments are primarily what the supporters of the passive strategy use as their explanation for not using managers. However some managers have proven they can beat the market continuously and therefore active investment funds are still popular and will be discussed in the coming section.

4.2.2 Active investment funds

If the average active fund has higher costs and will not beat the average passive fund in the long term, why is the strategy still so popular? The answer lies in the optimism of investors and in the flexibility that managers, contrary to passive funds, can offer. While there are no specific theories explaining why active managers are superior to passive funds, there is empirical evidence suggesting that active funds can be a better choice of investment strategy (Lin, 2014) (Baks, et al., 2001).

First of all the expectation of above average manager performance can be mentioned as a driver for actively managed portfolios. Investors will try to find portfolio managers that will consistently beat the market in order to achieve higher than average market returns. While it is difficult to empirically find managers that consistently beat the market over a time span of 10-20 years, there is plenty of empirical evidence suggesting that in shorter periods active funds can be superior to the passive funds (Lin, 2014). The largest obstacle the investors face is to find managers that beat the market on a year-to-year basis. Historical performance is not a guarantee for future success, which implies that a manager who has beat the market 3 years in a row is just as likely to underperform the following year.

Using an active portfolio strategy can thus be referred to as a high-risk/high-reward strategy given the fact that active portfolio investors' will always face higher costs but not necessarily higher returns. Research suggests that the average investor will be optimistic in terms of own investment skills, implying that the average investor believes that he is able to find an active fund that can beat the market. This is generally referred to as "investor optimism" (Hu, et al., 2009).

The other main driver for using an active portfolio strategy is the flexibility that these funds offer. Although the market historically goes up it is not on a consistent yearly basis. During downturns, where the market experiences great declines in a short amount of time, empirical evidence suggest that actively managed portfolios in these periods are superior to the passive portfolios (Lin, 2014). The reasoning should be clear – in times where the market declines active managers are able to allocate the capital of the portfolio into more reliable assets such as cash, gold etc. The flexibility of active managers allows them to quickly move away from declining assets while the passive portfolios must follow the direction of the market.

4.2.3 Active and Passive portfolios

In recent years the general discussion of whether to invest in active or passive portfolios has turned towards a collaboration of the two strategies. Many researchers and active investors highlight the benefits of using a combination of active and passive strategies because it can combine the upside of both strategies (O'Shaughnessy, 2013) (Vanguard, 2012). The reasoning is simple – if the portfolio consists of half the capital being indexed and the other half being actively managed then investors will have lower costs than in a 100% actively invested portfolio but will still be able to seek the opportunity of beating the market (Vanguard, 2012). However, should the actively managed part of the portfolio be better than the market, then the reward will be half of what could have been, but the investor is also partially hedged towards underperforming managers due to the capital invested in the passive portfolio. The trend of using a combination of the two strategies has increased in the last decade as investors are seeking a portfolio composition of both passive and actively managed assets.

4.3 The Sport-Relations Investment Fund – active or passive?

Based on the definitions outlined in the above section it is possible to determine whether the SRIF must be categorized as active or passive. Since a fund or index similar to what is being created in this thesis does not exist, it seems obvious that it will be impossible to mirror any index. Therefore, the mutual fund is per definition an active fund. The fund will have to be actively created and the asset allocation of the fund must be done by the investing managers controlling the fund. However, there are still characteristics concerning our fund that to a higher degree resembles a passive rather than an active fund.

First of all, most active funds reallocate the assets in the fund multiple times a year. This, as mentioned in the previous section, is done in order to try and beat the market and to most effectively exploit the current state of economy. Multiple yearly reallocations of assets will not be pursued in SRIF. Instead the idea is that the fund should be reassessed and reallocated once every year, as is the case with most passive funds. This distinction is important since it affects the costs of the fund – which will be analyzed in the following section.

The concept of first-mover must also be discussed to assess whether the fund should be considered active or passive. The statement that SRIF is active since it does not passively mirror another fund or index is complicated since SRIF is the first of its kind. Therefore, this thesis argues that the most applicable definition of the fund is that it is active but with passive characteristics.

This definition of SRIF can surely be questioned since the underlying problem with the fund is that it does not fit either description of an active or passive fund. However, it is believed that this description of the fund is most aligned with the allocation approach applied in section 7.0

4.3.1 Costs of the mutual fund

Most investors do not have the time or the resources to effectively invest their capital in the optimal way. If they did, then index or mutual fund investing would not exist since all investors would optimally allocate wealth on their own. But since this is practically impossible for most investors, mutual funds are able to charge a certain fee and in turn take care of the allocation of its investors' capital. This is more commonly known as administrative costs. The amount of administrative costs is obviously important to the investor because they can alter the actual realized returns drastically. This section will therefore review the administrative costs of a mutual fund, specifically domiciled in Denmark, and subsequently the potential administrative costs of SRIF will be analyzed.

The administrative costs, or expense fees, of an active mutual fund generally consist of three things (Alpert, et al., 2015):

1. Front loads – Front loads are equivalent to a start-up fee, and is paid by the investor when joining the mutual fund.
2. General expense fees – These are the maintenance costs of the fund. These consist of the costs of sales/purchase of stocks within the fund, manager fees, and all other costs that are generally associated with maintaining the fund.
3. Additional commission fees – This fee is paid to the mutual fund managers if they are able to beat a pre-arranged benchmark. This implies that the investor will only pay the front load and the general expense fees unless the fund is able to achieve returns above the benchmark. If the fund is able to achieve higher returns, a percentage of the excess return will be paid to the managers. In Denmark, mutual funds are able to charge this fee, but they are not obliged to conversely pay the investor back if the fund underperforms.

Most of the literature concerning costs of mutual funds generally agrees that economies of scale should exist, but in practice this is rarely observed (Malkiel, 2013). In fact, even though mutual funds on a global level has expanded rapidly since 1980 and the fact that research have showed downward sloping cost curves for every manageable asset, the administration costs have steadily risen during the last 35 years (Malkiel, 2013). The costs of creating a mutual fund are substantial, as many divisions are needed in order for the fund to comply with the existing legislation. Board executives need to be hired together with security analysts to comply with the legal framework concerning asset allocation. In terms of compliance procedures some form of legal team also needs to be in place. These are just a fraction of fixed costs for a mutual fund, but since they are fixed they should comparatively diminish as economies of scale take place (Malkiel, 2013). Since the costs historically have not been diminishing the most common theory found in mutual fund research is that the mutual fund managers are benefiting from the increased investor fees (Malkiel, 2013). In fact, studies have shown that some mutual funds are charging investor fees comparable to active fund fees, even though the funds are simply shadowing already existing indexes (Miller, 2007).

The ability to keep fees at such a high level despite the increased competition amongst active funds is explained by the fact that the funds market themselves on diversification and flexibility, and not on price (Miller, 2007). This diversification strategy is in sharp contrast to the passive/index funds which use a price strategy in order to attract investors (Miller, 2007). This difference in strategy can also be empirically observed as the administration fees for passive funds have been declining the last 15 years and are as low as 0.18% for the Vanguards index which is the largest index in the world (Miller, 2007).

Based on the most recent report from Morningstar (Alpert, et al., 2015), which analyze the conditions of mutual funds and how friendly the environment is for the investors, the mutual funds in Denmark are in the low-cost end. The report compares 25 countries from America, Europe and Asia, with South Africa being the only represented country from Africa. The fact that the administration fees in Denmark are so comparatively low seems somewhat counterintuitive. The European commission introduced the new UCITS rules with the intent purpose on making over-the-borders investment easier in order to enhance competition and create economies of scale within the European Union. Despite this effort the Morningstar report concludes that the lowest administration costs for mutual funds are not observed at the largest European mutual funds (Alpert, et al., 2015).

On the contrary, the lowest costs mutual funds are found in the smaller more nationally orientated markets, with Denmark being a prime example (Alpert, et al., 2015).

It is important to note that Morningstar measures the overall costs of mutual funds in two ways. The first is referred to as "Domiciled costs" which includes the costs for all investors located within the specific country and is the lower of the two reported numbers. This is due to the fact that many mutual funds are linked to national banks and therefore national investors typically can achieve overall lower fees through negotiations with their bank. The other reported number is referred to as "For sales costs" indicating the overall administrative costs of the mutual fund for all other investors not domiciled in the specific country. The funds are also divided into different categories depending on which assets the funds contain. Since SRIF will exclusively operate with stocks/equity, this is the category that will be presented here.

In terms of both reported costs-categories Denmark sits close to the top of the rankings, indicating that mutual funds have comparatively low-costs in Denmark (Alpert, et al., 2015). For domiciled investors in Denmark the average mutual fund administration costs are 1.54% of invested capital, with the average for the 25 countries being around 1.70%. For all other investors looking to invest in mutual funds located in Denmark the average administration costs are 1.82% with the average being approximately 1.92%.

As mentioned in the previous section the definition of SRIF as passive or active is somewhat challenging which complicates the process of trying to estimate the costs of SRIF. However, since it has been concluded that SRIF is an active fund, the most straight-forward approach will be to peg the fund to the active fund average in Denmark; 1.54% for domestic investors and 1.82% for all other investors. This number could potentially be even lower for SRIF since it is not reallocating its equity more than once a year.

4.4 Investor Relations

With the immense amount of different mutual funds to invest in, it can be hard to distinguish them from one another. Sometimes the differences are small as some indexes are extremely popular to benchmark. Mutual funds can however distinguish themselves by investor relationships. How fund managers specifically take care of this personal relationship, especially with the bigger investors, are outside the scope of this thesis, but we will however highlight some areas where SRIF could

have an advantage.

As we will define in section 5.7, SRIF will include assets in the sport network and industry. Therefore there will be great opportunities to get access to sporting events through these companies, a feature that some investors hopefully would consider before deciding whether to put their money in SRIF or elsewhere. Furthermore, sport is something that creates a great deal more passion than other industries (Beirholm, 2008), and an indirect investment in the sports industry could as such create a great deal more enthusiasm from the investor who also considers himself a sports fan.

4.5 Summary

It has through this section been realized that SRIF lies somewhere between the definition of active and passive investment fund, as there currently are no right benchmark for it. Therefore the cost-structure for a potential SRIF has been based on average administrative costs of Danish equity mutual funds.

Through an analysis of the current Danish legislative framework, guidelines have been provided for the restrictions SRIF must follow, and especially the so-called 5-10-40 rule will be of great importance. Lastly, it is believed that the assets included in SRIF can create some passion and excitement that other mutual funds cannot.

5.0 Market opportunity and the sports network

There are currently no mutual funds in the world having sport-relations as a theme. There are however lots of other themed mutual funds; environmental, technology and biotechnology to name a few. At the same time sport is an industry which seemingly has continuing growth potential. Therefore, it is believable that a creation of a Sport-Relations Investment Fund would generate some interest from investors if it can prove to be competitive with the rest of the market.
We will start by defining the criteria for sports and through application of network theory define the sports network. We will highlight the main actors of the network and describe the unique characteristics of sport and its network.
Following this, we will define the SRIF universe and conduct PEST analyses of the most crucial industries within the universe.

5.0.1 Methodology

In this coming section we will use a number of assumptions and definitions made by Jørgensen and Vesterheden (2010) in regards to defining sports and assets fit for SRIF, since we believe it to be the most credible way of extending the research.
In terms of the social network theory, competitive balance and winning vs. profitability sections we have used academic literature found through the CBS e-library from various scholars to highlight the current academic progress within these fields. Furthermore we have used news articles from, what is believed to be valid sources, to highlight some of the current trends in the sector.
Additionally, we have produced primary data through two interviews. The first with Olav Skaaning Andersen, editor in chief at B.T. and the second with Denys Lund, CRM specialist at Danske Spil. This was done to gain relevant insight in respectively the media and gambling industry. Both interviews were structured around semi-open questions in order to get around as much as possible and to acknowledge Olav and Denys' more extensive knowledge. The validity of their input can naturally be questioned due to subjectivity, but is deemed relevant to the thesis due to their industry experience.The interviews were transcribed based on sound recording, with minor details being left out because of the non-relevance factor. It has not been transcribed word for word in order to help the reader get a clearer overview of what was discussed. The transcripts can be found in appendix E and F.
Finally, the conditions within the sporting network have been evaluated based on PEST analyses.

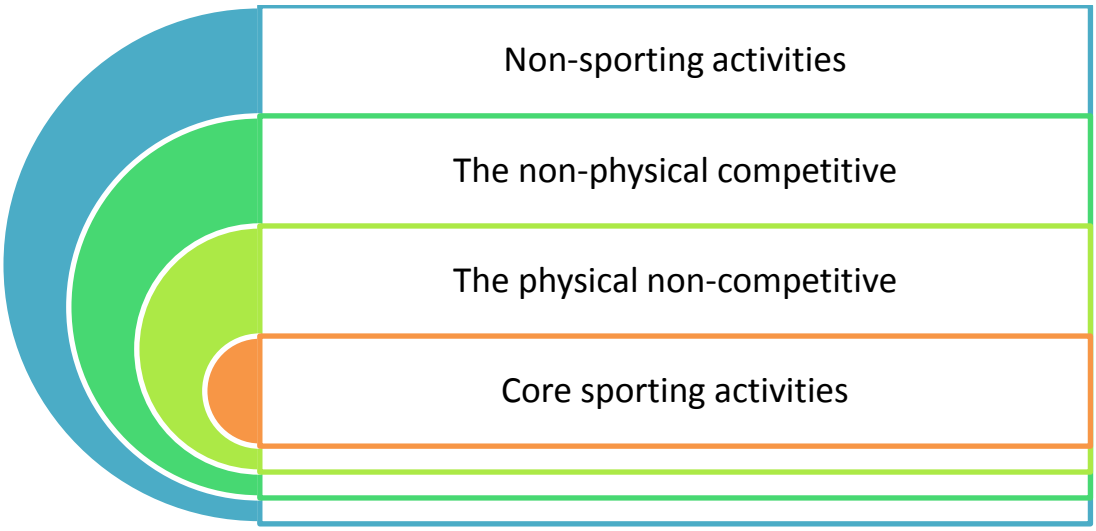
There are numerous other ways of approaching the question of macro-economic conditions within an industry – such as Porter's Five Forces – but PEST was chosen as we believed it to be the best fit for this analysis.

5.1 The definition of sports

Sport can be defined as everything ranging from the World cup final in football and the 100m final in the Olympic Games, to a group of friends playing petanque or the individual leisure run. These activities range from the extremely fierce, competitive and economically life-changing, to the non-competitive activity free of charge. These examples naturally imply different stakeholders, but at the same time some are similar. Therefore, we need some clear cut definitions of the sport activity to later identify the possible investable assets for the Sport-Relations Investment Fund.

Sport as an industry is fairly complicated to define, and so far no perfect definition has been generally accepted by academics. The public notion of what is considered a sport and what is not, is even more divided. Some believe sport should involve some kind of exercise whereas others believe that the defining criterion is the fact that a winner can be pointed out afterwards. Therefore, we have used Jørgensen & Vesterheden's (2010) definitions and assumptions concerning sport. They come up with four separate distinctions of activities and sports.

Figure 2 – Sports Definition – Source: Jørgensen & Vesterheden, 2010



- Non-sporting activities (e.g. painting, book reading etc.)
- The non-physical competitive (e.g. poker, computer gaming, chess etc.)
- The physical non-competitive (e.g. leisure run, fitness center visit etc.)
- Core sporting activities (football, tennis, volleyball etc.)

(Jørgensen & Vesterheden, 2010)

Except the non-sporting activities, all provide some form of value to stakeholders of the sport industry. This distinction means that for our coming selection of companies relevant for SRIF, they have to gain some kind of value through either a non-physical competitive, a physical non-competitive or a core sporting activity.

Secondly, Jørgensen & Vesterheden (2010) acknowledge spectator involvement, whether it is through some media channel or as an active spectator live at the event, as equally crucial for the industry. In their definition you can participate in a sporting event through three different involvement levels, where the two latter are centered on spectating:

1. Participating in the actual event as a player, referee, official etc.
2. Watching the sport live as a spectator
3. Following the event through media channels (TV, livestreaming, radio, live feed etc.)

(Jørgensen & Vesterheden, 2010)

These three distinctive involvements all add to the increasing value of sporting events. The players are of course the essential part, but without spectators to create the right atmosphere and the revenues from TV-distributing, the sport can lose its competitive edge compared to rival sports.

In conclusion, the upcoming selection of companies fitted for our Sport-Relations Investment Fund will have to be aligned and have some revenue stream coming from either one of the three involving activities of sport participation. Furthermore, the sport must be defined as one of the three latter activities in the sport definition section seen in

Figure 2.

5.2 Network Theory

This section will review and highlight the network theory used to depict the network within sports. There will be a strong emphasis on social network theory within sport, since this is most applicable to our thesis. The main contribution of social network theory is to describe how the major stakeholders within a network transact with each other.
This section will first provide a brief overview of social network theory and afterwards a review of the social network theories view on some of the relationships in the sports network.

During the last two decades political science has had an increasing interest in the concept of "networks" and how they influence decision making (Grix & Phillpots, 2010) (Quatman & Chelladural, 2008). Previously, policy making was considered to be very top-down approached, meaning that there was a strict hierarchy and decision making were often mostly influenced by industry leaders and government. This was the case for most industries and it was generally considered that small stakeholders were not part of the actual decision making (Grix & Phillpots, 2010). This approach has changed considerably during the last 20 years as social network theories have emerged and impacted many industries and countries. The concept of social network is to view the interaction between actors within a network as dynamic relationships. Decision making is now more influenced by dynamic smaller social networks constantly affecting one another, making the internal power relations much harder to grasp (Wolfe, et al., 2002). It is essentially the relations within a social network that are interesting to understand since it determines where the actual decision making happens and how the different key actors are able to affect each other (Wolfe, et al., 2002).

The sports network is widely considered, within social network theory, to be generally affected by inter-organizational relationships, or perhaps more fittingly, the performance of an organization within the sports network is very dependent on its inter-organizational relationships (Pietiers, et al., 2012). The main actors within a sports network are sport clubs, media, sponsors, spectators and governments (Pietiers, et al., 2012). The application of social network theory is fairly new within the sport industry (Pietiers, et al., 2012). This is somewhat surprising since it would appear quite intuitive to apply it to a sector that is so interdependent on the various actors. Nonetheless, it is only

the research literature concerning the relationship between sport, media and sponsors which will be reviewed due to the limited scope of this thesis. However, it could be argued that consumers/fans are just as important to the sport network, but due to the lack of satisfying literature about the sport-consumer relationship within social network theory, this aspect is not investigated in this paper.

5.2.1 Relationships in the sports network

The classical business-to-business network model where the actors all have the same goal (profit maximization) fails to apply to the sport network. The sports network is comprised of different actors with fundamentally different structures, missions and objectives (see section 5.5). Yet, a social network between the different actors appears to benefit each entity (Wolfe, et al., 2002) (Quatman & Chelladural, 2008). Here we will describe the two most academically reviewed relationships in the sport network.

Media-Sports relationship

Sport is one of the few cultural entities in the world able to influence people and achieve a mass following. Mass media, in the form of TV and internet, is able to capture this mass following and distribute sport to a global audience (The Economist, 2008). The interdependency of the two has allowed both to prosper, creating a strong tie between them. In some instances mass media has helped different activities to become generally acknowledged as legitimate sports. An example of this could be boxing which through newspaper and radio coverage went from being viewed as a savage activity of violence to a high-profile sport. Conversely, boxing essentially helped the mass media of the 21th century in introducing pay-per-view options for TV and internet consumers (Wolfe, et al., 2002).

It is interesting to debate whether mass media drives the interest of sports or, conversely, if it is the interest of sports that makes it suitable for mass media. It is difficult to assess which of the two actors that is most dependent on the relationship, but it can be argued that mass media would exist without sport, but sports would not have been able to expand globally without mass media (Fortunato, 2000). But is this enough to suggest that mass media has more power within the relationship? Wolfe, et.al (2002) argues that a certain trade-off between the two must be expected. The enormous amount of revenue that leagues such as NBA, NFL and the Premier League receive

from selling broadcasting rights (see section 5.3.4) also implies that the media must have some say in the scheduling and presentation of these events.

This dynamic relationship is balancing on a fine line, since mass media certainly have a right to interfere, given their financial contribution, as long as it does not interfere with the integrity of the sport in question (Fortunato, 2000). One of the clearest examples of media trying to interfere too much was in 1994 during the FIFA World Cup in the US. Here, broadcasters tried to split the football game up into 4 quarters in order to have more commercial airtime (Wolfe, et al., 2002). However, it is also argued that sports leagues are beginning to have an increased amount of leverage in the media-sport relationship, since the amount of broadcasters has grown dramatically (Rein, et al., 2007). This greater competition between broadcasters allow the sports leagues to browse the market in order to find the media partners that have the best fit (The Economist, 2008). Therefore, it appears that the increased competition in the media-sector is restoring a more balanced relationship between sports and media (Rein, et al., 2007).

Sponsor-Sports relationship

Pietiers et al. (2012) applied social network theory towards the Dutch amateur football clubs in order to determine the impact of the relationship between clubs and sponsors. By looking at amateur clubs instead of professional, it becomes easier to isolate the relationship between sponsors and club, since the clubs has no economic leverage from areas such as merchandise selling or television rights. They found that there are three factors mainly influencing the amount of funds a club is able to attract from its sponsors (Pietiers, et al., 2012). First of all, the amount of sponsors has a positive effect on the funds received. This appears to be intuitive. However, it is debatable whether this would actually be the case for the top-tier professional clubs as they might have fewer but vastly bigger sponsors. More interesting is the fact that increased interaction between the club and its sponsor's lead to higher amounts of funds. This implies that the more dynamic the relationship is and the higher the frequency of contact is, the more the club seems to benefit.
According to Pietiers, et al. (2012), it can be observed that the vast majority (70%) of a clubs sponsors' are located within 5 kilometers. But the geographical proximity between a club and its sponsors does not seem to affect the amount of funds received.

The above example paints an accurate picture of the classic sport club-sponsor relationship. It is acknowledged that the example is of amateur clubs, but describes the most important features of the relationship.

5.2.2 Interdependency between network actors

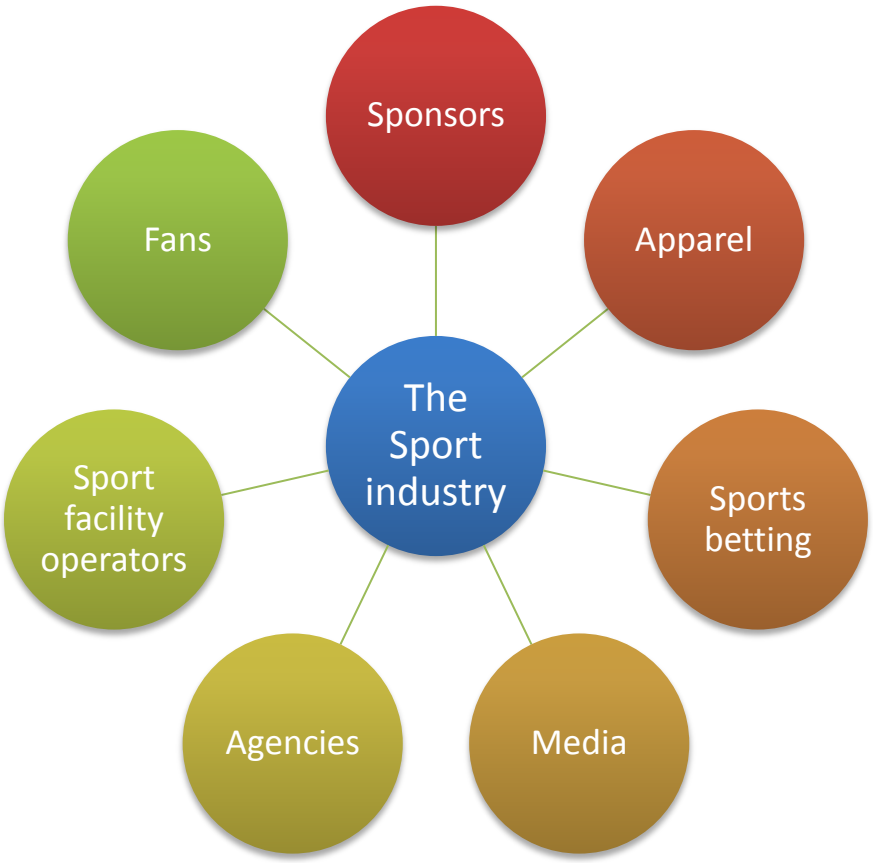
It is clear that sport clubs depend on media and their sponsors. However, sponsors and the media also have strong interdependency. The media pays enormous sums in order to buy the broadcasting rights for a certain sport event, and of course these expenses must be redeemed. This is done through revenue from fans who buy the broadcasters TV- or streaming packages, but a large amount also comes from companies which advertise through commercials. Retailers, such as Nike or Adidas and gambling companies such as Paddypower and William Hill, use the commercial slots in order to brand themselves during sport events. Furthermore, a lot of the retailers and gambling companies also serve as direct sponsors to the clubs or sports leagues, meaning that they are involved in many parts of the sport network. This is vital for the understanding of the sport network, because it explains why the network is so strong. If a company plays more than one role within a network it also implies that their performance is affected by more parts of the network. Therefore, a company such as Nike, which sell its products to sports fans, advertises through the media, sponsor individual clubs and entire sports leagues, is extremely involved in the sport network. This is the case for most retailers, gambling and media companies and thus they all have an interest in seeing the other stakeholders of the network succeed.

The above section has described how social networks are able to explain the interaction and interdependency of different actors. The following section will describe and analyze the most important actors in the sports network and which actors are suitable for inclusion in SRIF.

5.3 The Sports Network

The sport industry is highly dependent on its surrounding network, which includes a broad range of companies and industries. Figure 3 shows the most important actors in the network of sport.

Figure 3 - The Sports Network - Source: own creation



Not all these industries/distinctions of stakeholders are represented in the upcoming definition of the SRIF stock universe. This is because they either lack positive correlation with the sporting industry as a whole or the inability to invest in the given stakeholder.
Next, we will go through the 7 defined groups of stakeholders and argue what characteristics that make them part of the sport network.

5.3.1 Sponsors

Starting with the obvious connection; it is widely acknowledged that sponsorship deals benefit both the sport club and the sponsoring company; the interesting question is how much it benefits the sponsor? To the sport club the value of the partnership is easily quantifiable, in terms of revenue increase. From the perspective of the sponsoring company it is more difficult to quantify exactly how much a logo on a football shirt, a stadium name or the name of a cycling team is worth to the

company. PwC (2011) stresses the fact that more sophisticated measurements should be developed in order to accurately measure the impact. It is however logical that all things equal better team performance equals more publicity. It is furthermore beneficial for the sponsor if the club increases its popularity. Ultimately most companies try to align themselves with the sound values of sport e.g. fairness, health and competition (Beirholm, 2008). The sponsor's closely correlated relationship with the sponsored team is however of great risk, as it loosely can be compared to investing in a single stock due to the uncertainty of performance.

5.3.2 Sports apparel/equipment manufacturers and retailers

Major market players in this category such as Nike, Adidas, Puma have significantly increased their value over the last 30 years, which naturally has something to do with the great revenue growth there has been in sports. An indication of this growth can be seen in the UK where the sport-related value has increased with 123% from 1985-2008 (Sport Industry Research Centre , 2010). Greater focus has come to sports equipment to be state-of-the-art, both for professional athletes, but also for the typical leisure athlete. Adding to the sport apparel companies' recent success is their ability to move the border between dress wear, casual wear and sporting wear, especially in the shoe industry (Statista, 2014). Another reason for growth is the sport manufacturers ability to be their own retailers, either through online platforms or the classic brick and mortar store (Marketline, 2014), a subject we will further investigate in a following PEST analysis of the industry.

The connection between the sport industry and the manufacturers seem to have a bright future, since more and more record breaking deals have been realized during the recent past; as for example Manchester United's deal with Adidas to be their kit sponsor for the next 10 years, worth £750 million (BBC, 2014) or Bayern Munich's 10 year deal with Adidas worth £645 million (The Guardian, 2015). In the case of Manchester United's kit deal, it is more than double the value of the previous most lucrative kit deal in European soccer, held by Real Madrid, which gives a good indication of how much growth there still seems to be in the sporting industry (BBC, 2014). However, nothing is guaranteed, and even though Adidas believes that the Manchester United deal is profitable for them through sales of shirts, increased brand value etc. the deal could end up as a bad investment for Adidas' shareholders. Therefore both parties have an interest in the success of the counterpart.

5.3.3 Sports betting

Another strong connection is the one between betting companies and the sport industry. Betting has seen significant growth during the last decade (Marketline, 2014) and especially the introduction of the smartphone has created immense possibilities for live-betting, a feature most consumers have positively welcomed.

"In regards to growth areas, the mobile platform has come very much into focus during the last couple of years. I believe that half of the online revenue realized from Oddset came through mobile gaming which also tells a lot about where we are going"

(Lund, 2015).

By being able to place wagers on next goal or yellow card in football or the winner of the next service game in tennis, consumers have been able to enhance their experience and thrill of the game. The correlation between betting and the popularity of sport is confirmed by Denys Lund (2015) in the fact that Danske Spil is seeing more bets on popular media sports. Therefore, it is in Danske Spil's interest to have as much sport as possible distributed across the various media platforms as it positively affects their bottom line.

5.3.4 Media

Recent media coverage of sport in general have exploded; more and more TV-channels which are focusing solely on sport are seeing the dawn of day, and a seemingly ever increasing amount of money is spent on rights for the TV-distribution of major sporting leagues. Especially the latest signing of TV-rights for The Barclays Premier League (best football league in England) which saw TV-networks Sky and BT Sport pay a record breaking £5.136bn (BBC, 2015). This is 71% more than last time, for the rights to show games over the next three years. Around 18 billion DKK a year is distributed between the 20 clubs and it is not only the biggest sports leagues in the world that are signing record breaking deals. Alka Superligaen's recent TV-rights have by been valued by TV Sports Markets to be at around 400 million DKK a year, which is 100 million DKK above the 2009-2012 level (Toft, 2014). The editor in chief at B.T., Olav Skaaning Andersen, supports the value of these kinds of deals in his interview by stating that;

"Viasat does not have a huge amount of viewers for their broadcasting of the Superliga, around 300,000 is my guess, but those that are there are just incredibly loyal, and that makes it possible to run a profitable business on it"

(Andersen, 2015)

According to SuperStats (2015) Viasat's broadcast of their Sunday match had an average of 187,926 viewers while their broadcast of the Friday, Saturday and Monday matches had around 100.000 viewers. Even though this is a bit less than what Andersen believed, it does not change the fact that Viasat is running a profitable business (Børsen, 2014). The amounts spend on purchasing sport broadcasting rights suggest that interest is growing, not only in football, but sport in general, since other examples of rising prices for sporting TV-rights are easy to come by. In the USA a bidding war between the major cable networks for the bigger sport leagues have increased the costs realized by consumers for sporting channels at a much greater pace than for example news channels (Kang, 2015). So far consumers have been willing to pay for these rising prices, giving support to our hypothesis suggesting that the better the sport is doing, the better the media is doing. Olav Skaaning Andersen (2015) confirmed that major sporting results drive especially online traffic on B.T.'s webpage and agreed that sport can be used to attract consumers and thus promote other parts of B.T.'s coverage. More and more digital broadcasting deals are seeing the light of day, but it is still the more popular sports that benefit from these (SportBusiness International, 2014).

5.3.5 Agencies

With rise in player wages, in especially the globally dominant sports, agents have come to play a substantial role in today's business. The amount of money there is to be earned for these agencies is highlighted by the fact that the world's most valuable sports agency, Creative Artist Agency had negotiated over $5.3 billion worth of current player contracts, equaling commissions for nearly $200 million (Forbes, 2013). These types of companies are critically dependent on highly professional driven leagues that provide high salaries for the players and coaches. In relation to the overall scope of this thesis there is however a problem, since most agencies are not publicly traded, thus it will not be further discussed in this thesis.

5.3.6 Sport facility operators

The majority of professional football, American football, basketball, baseball and ice hockey franchises own and operates their own stadiums. There is however companies which operate arenas or stadiums that are used for special events such as MCH. MCH operate Jyske Bank BOXEN (MCH, 2015) which for example has been used for international handball competitions. Numerous other companies like bowling centers, fitness chains and ski resorts all fall under this category, as these activities are defined as sports according to our aforementioned criteria.
Extensive analysis of the companies within this grouping is however too complicated, as they are not defined under one single industry when using conventional methods.

5.3.7 Fans

The fans, or consumers, are naturally crucial to the industry. Fan bases create the awareness that a player or club needs to be of interest to other parts of the sports network. They create the atmosphere at the stadiums, buy the merchandise and are of great potential value to sponsors. The higher the interest for a given sport, the higher the interest for the specific club and this creates a positive cycle. This makes the trend of increasing broadcasting deals a natural one and particularly the major sports benefit from this attention (SportBusiness International, 2014). At the same time there is a great push from the big sporting leagues, especially from the US, to increase their presence on a global scale, hereunder Europe and China in particular, to grow their fan base (SportBusiness International, 2007). A more detailed analysis of the importance of sports fans is outside the scope of this thesis, since they cannot be invested in via SRIF.

5.3.8 Summary

These seven brief analyses generally describe the stakeholder of the sport network. Andersen (2015) further suggests that there is an internal circulation between the different sports, signifying that interest in a specific sport drives interest for sports in general. All this backs up our hypothesis of the inter-correlated sports network which suggest that there should be a positive outlook for companies within this network if the sport industry continues to grow.

5.4 Competitive balance

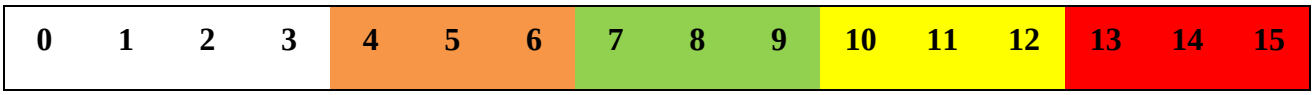
Sport is a business, and like every other industry, only the strongest prosper. Clubs compete fiercely, not only in matches, but also outside the arena for the best players, coaches and staff while simultaneously focusing on having the strongest brand, the most fans and the better sponsor contracts. All to be able to win as many matches as possible.

But contrary to other business industries, most professional sports leagues try to redistribute the wealth more or less equal in order to obtain as high a Competitive Balance (CB) (Troelsen & Dejonghe, 2006) as possible, to keep interest. High CB indicates that all teams have a legitimate chance of finishing high up in the rankings every season, meaning that over a longer time span, championships are divided out between more teams. On the contrary a low CB means that the same teams consistently dominate.

"Lack of competitive balance means that the number of spectators, both match going fans and those watching televised matches, is not maximized and that the league runs the risk of losing spectators in the long term."

(Michie & Oughton, 2004)

In terms of CB a clear distinction is made between static CB (the relative difference between the top and the bottom teams, but not whether it is the same teams constantly at the top) and Dynamic CB (How often the same teams dominate the top of the league and how the general mobility of teams are) (Troelsen, 2008). Dynamic CB (DCB) is, in the terms of league design, the most interesting, and a robust measure of DCB has been developed by Troelsen & Dejonghe (2006). DCB measures the score of the top two teams in a given league over a 5 year period. A Championship is given 2 points and the runner-up is given 1 point. The two teams with the highest scores are added up to get the Dynamic Top2-CB-Index. The league gets a score between 4 and 15 which then can be compared (Troelsen, 2008).



- DCB score of 0-3 is not possible
- DCB score of 4-6 is too balanced for a league to be exiting. Unreal case scenario.

- DCB score of 6-9 is a balanced league (green) = High DCB, ideal state of a league
- DCB score of 10-12 is an imperfectly balanced league (yellow) = amid high and low DCB
- DCB score of 13-15 is an unbalanced league (red) = Low Dynamic Competitive Balance (DCB). It is not advisable to have values of DCB as high as this.

(Troelsen, 2008)

Especially the four big sports leagues in North America (NA-4); NFL (American football), NBA (Basketball), NHL (Ice hockey) and MLB (Baseball), have with great success implemented regulations improving overall competitive balance. Such regulations include; closed league systems, salary caps, revenue sharing, drafting of talents and a professional ruling and management of the leagues (Troelsen & Dejonghe, 2006). This has created more commercial competition between the leagues and increased general popularity for the sports, which have greatly affected revenues for both teams and leagues.

If you cross the Atlantic and look at Europe, there is a clear number one sport in football, which on the contrary to the North American leagues, use open league designs, unlimited player budgets, and little revenue sharing (Troelsen & Dejonghe, 2006). This is easily identifiable if we compare DCB of the 4 major football leagues in Europe (EU-4) with that of the North American sport leagues over the last 5 years.

Table 1 – CB in European Football

DCB for EU-4 between 2011-2015				
Sport	**Football**	**Football**	**Football**	**Football**
Country	**England**	**Spain**	**Germany**	**Italy**
League Name	**Barclays Premier League**	**Primera Division**	**Bundesliga**	**Serie A**
Teams	Manchester United (5)	Barcelona (8)	Bayern Munich (7)	Juventus (8)
	Manchester City (5)	Real Madrid (5)	Borussia Dortmund (6)	AC Milan (3)
DCB score	**10**	**13**	**13**	**11**

Table 2 – CB in North American Sport

DCB for NA-4 between 2011-2015				
Sport	**American football**	**Baseball**	**Basketball**	**Ice Hockey**
Country	**USA**	**USA**	**USA**	**USA and Canada**
League Name	**NFL**	**MLB** [1]	**NBA**	**NHL**
Teams	New England Patriots (3)	San Francisco Giants (6)	Miami Heat (6)	Chicago Blackhawks (4)
	Seattle Seahawks (3)	St. Louis Cardinals (3)	San Antonio Spurs (3)	Los Angeles Kings (4)
DCB score	**6**	**9**	**9**	**8**

As

[1] Seasons 2010-2014 were used, since 2015 season is not concluded as of 16th of August 2015.

Table 1 and Table 2 show there is a general high competitiveness in the NA-4 compared to the EU-4 over the last 5 years. All North American leagues are within the range of the" balanced league" which supposedly is the optimal state for a league. Looking at EU-4 there is much less competitiveness and especially in Spain and Germany there is low competitiveness with DCB values so high that it symbolizes an unhealthy unbalanced league.

During the recent past, there has however been implemented a number of regulations in order to level the playing field and, more crucially, to secure the long term financial stability of European football clubs. The Barclays Premier League has started to; distribute 50% of their broadcasting revenue independent of performance, provide parachute packages for relegated teams and set a maximum increase in player wage (Premier League, 2015). More importantly, the Union of European Football Associations (UEFA) has implemented Financial Fair Play (FFP) which has put a limit on the allowed amount of deficit for a club competing in international tournaments (UEFA, 2015). This aims to increase the competitive balance on a transnational level.

A more thorough analysis of Competitive Balance in the major sporting leagues is outside the scope of this thesis, but despite the simple analysis it should give rise to a basic understanding and shed some light on the future possibilities for the sport industry. At the same time, we acknowledge that our analysis have not included any assessment of how smaller sport leagues will be affected by the growth in the major. The conclusion must therefore be that Competitive Balance is starting to be considered a serious driver of future popularity. There is however still some way to go, especially in Europe, before optimal balance is reached, assuming is it indeed the aim of the leagues.

5.5 Winning versus profitability

One of the biggest conflicts in sports is that of profitability versus winning. Especially in open European football leagues there has been focus on winning as the dominating criteria. Wealthy investors have purchased bigger clubs, not as profit generators, but with the aim of winning trophies and glory (Troelsen, 2008). At the same time there have been indications that player wages affect future performance combined with previous winning percentage (Hall, et al., 2002). The fact is that player wages have skyrocketed with the overall revenue growth in the sport industry, often leaving the clubs in financial slumps (Troelsen, 2008). Football clubs from Spain and England have been found to behave according to an aim of win maximization, with the budget constraint of zero profits

(Garcia-del-Barro & Szymanski, 2009). In reality there have been a number of clubs running on a deficit thus going bankrupt, the most famous being Glasgow Rangers F.C. Another good example of the state of the European football clubs is UEFA's report from 2012 about the overall profitability of 665 clubs from 53 countries in the 2009/10 season, which suggested a 36% increase in the deficit to 1.6 billion DKK compared to the previous year (Kjærgaard, 2012). This is why the aforementioned implementation of Financial Fair Play probably is the single most important regulation on a transnational level as it tries to restrict clubs from spending more money than they earn (UEFA, 2015). The sanctions stem from fines to bans from European competitions and thus great revenue potential. While FFP is undoubtedly a sound economic regulation, there has been some debate over whether it is manifesting the big clubs at the top of the pyramid as they can continue to offer better wages for players than smaller clubs with less commercial activities and thus less revenue. FFP however does not have any effect on clubs not playing in tournaments under UEFA, and the wage bill therefore still remains a great challenge for these clubs, especially in England where the wage to revenue ratio is 70% and 90% in respectively the best and second best division (Deloitte, 2013).

The key to combining profit and winning therefore seems to be centered on controlling player wages, a feature the big sport leagues in North America, and especially the NFL, has had great success with in terms of their salary caps and high competitive balance. It might be that the European definition and cultural perspective on sports league design cannot be changed into the more profit friendly version, similar to the North American model, simply due to the great amount of conflicting interests. The North American approach however might be sub-optimal too, as Szymanski (2003) tries to explain:

> "*All schemes used in the United States punish excellence in one way or another. The European football approach punishes failure by promoting excellent minor league teams to the majors and demoting (relegating) poor performing major league teams back down to the minors… It is an interesting economic question as to which system achieves better results".*

The question is then; if it is the performance of the best clubs or the overall competitive balance that drive profitability, a question not found a definite answer too.

5.6 Robustness and Loyalty

Few, if any, industries have such loyal consumers like the sport industry. It is an industry build upon interdependent communities (Beirholm, 2008), as also discussed in the previous network section. People grow up as supporters of specific teams and, more often than not, stay loyal to their respective team for the remainder of their life. This loyalty is worth gold to both the club and the network around the club. A loyal supporter of the football club Brøndbyernes IF will probably; see multiple games at Brøndby Stadion every season, buy the playing kit (produced by Hummel), bet through bet25.dk (main sponsor of Brøndbyernes IF), watch the remainder of the games at one of Viasats TV channels, and read B.T. every Monday for more news and analysis about the team. This example, although fictive, nicely describes how sports fans create economic activity in many parts of the sport network even in tough economic conditions. Rick Dudley backs this with his findings, stating that:

"*Recently, we conducted a survey and learned that sports fans were significantly less likely than non-fans to report that the economy will drastically impact them personally or their spending behavior*".

(SportBusiness International, 2009).

Editor in Chief at B.T. Olav Skaaning Andersen has another relevant notion about sports loyalty, in regard to the number of sold newspapers (appendix E – Interview with Olav Skaaning Andersen

"Sport is something that divides people, some people really have an interest and some people really do not and cannot stand it. We could not survive as mainly a sports newspaper, but sport means a lot, since a lot of people (40%) buys the paper because of that"

(Andersen, 2015)

At the same time he confirmed sport as a huge driver of viewers, readers, listeners etc. in regards to the media industry (Andersen, 2015).

The horizon is however not cloud free. In North America fan interest in terms of attendance is slightly falling because of the competition from fantasy leagues[2] and video games. This trend seems however reversible if fans are to be included in more executive decisions concerning their team

[2] A Fantasy league is a statistical game where fans compete against one another by selecting a fictive sports team composed of real players from the given sport.

(Hyatt, et al., 2013). The consequences of such fan involvement have however yet to be seen on a broad scale.

5.7 Stock universe

When creating a mutual fund, one must first define the universe of stocks that are to be invested in. The first step is to create a strategic mission which possible investors can relate to and the second is to identify which benchmarks the portfolio must be measured against.
The SRIF universe is based on our aforementioned sports defining criteria and involving activities and the authors' judgment of overall fit with the sports network. The universe has been put together through analysis of the major stock exchanges (NYSE, Dow Jones, NASDAQ, London Stock Exchange, Frankfurt Stock Exchange, Borsa Italiana, Borsa Istanbul, Paris Stock Exchange, Tokyo Stock Exchange, Euronext Lisbon, Vienna Stock Exchange and OMX Nordic) where relevant industries were selected and the individual assets then assessed for applicability. Secondly, DataStream and Bloomberg were used to identify sport-related stocks from stock exchanges that couldn't be thoroughly analyzed due to budget and/or time constraints. Stocks were included if deemed relevant according to the authors' judgement.

In order to assess the universe of sport-related stocks, a set of restrictions and assumptions has to be defined in order to accurately determine which stocks that belong in the universe and which do not. An overall set of rules will be outlined, together with some specifics for the five crucial sectors as these are assessed to be so fundamentally different that a fit-all mentality would be unwise.

In order to qualify for the SRIF universe an asset must have:

- Some part of its revenue stream related to the sport industry
- Indirect ownership of a sport club is not assumed to be substantial
- Sponsoring a sport club is not considered sufficient
- 5 years of available stock price data

For the four crucial sectors, the restrictions are as follows

- **Sports equipment/apparel**
    - The brand must be broadly recognized as sporty
    - A substantial part of its revenue stream must come from sporting goods

    - Whether the companies is manufacturing or distributing sporty products is irrelevant
- **Betting**
    - At least 33% of revenue must come from sports betting
- **Broadcasting**
    - Have a substantial amount of sport channels, whether it be TV, radio etc.
    - Be one of the dominating networks in broadcasting of a nationally acknowledged top popular sport (e.g. American football in USA and football in England)
- **Recreational Products & Services**
    - Must realize revenue from one of the three defining sports criteria or three activities within sports
- **Sport clubs**
    - Must compete in a defined setting against other players and teams

Whether a company can be defined as part of the sport network is a subjective matter. We have therefore chosen these softer restrictions in order to be inclusive rather than exclusive. Furthermore a discussion about whether specific apparel objects are used for sportive or simple casual wear is outside the scope of this thesis.

Being a sponsor of a sport club is not considered sufficient involvement in the sports network to be part of SRIF universe. The reason is that a sponsor is closely tied with the sponsored team but not with the industry in general. The main business needs to be within the sports network to be relevant. A broad range of sponsorships in the sport industry such as Nike and Adidas' sponsoring of an enormous range of teams and thus getting the right to design their playing uniforms, can qualify the company for SRIF. Adidas and Nike are however already present because of their status as sports apparel manufacturers. A list of all 85 companies in the universe and a brief description of their business can be seen in Table 3.

Table 3 – SRIF stock universe

Comapny Name	Stock ticker	Industry	Stock Exchange	Description	Webpage
Adidas	D:ADS	Apparel	Frankfurt Stock Exchange	Has together with Nike been one of the dominant companies in manufacturing sports equipment during the last 30 years	www.global.adidas.com/
AFC AJAX	H:AFC	Football Club	EuroNext Amsterdam	Dutch based football club located in Amsterdam and playing in the Dutch Eresdivsie	english.ajax.nl/
AIK FOOTBALL	W:AIK	Football Club	OMX Nordic	Swedish based football club located in Stockholm and playing in Alsvenskan	aik.se/
Amer Sports Oyj, AMEAS,	M:AMA	Apparel	OMX Nordic	Amer Sports Oyj, through subsidiaries, develops, manufactures, and markets sports and fitness equipment. The Company makes golf, racquet sports, winter sports, and team sports equipment, as well as diving gear and workout equipment	www.amersports.com
ANTA Sports products limited	K:ANIT	Apparel	Hong Kong Stock Exchange	China based company which develops, designs, manufacture and markets their own ANTA branded sportswear. Owns the Fila trademark in China and Hong Kong	en.anta.com/
ARHUS ELITE	DK:ELB	Football Club	OMX Nordic	Danish based football club located in Aarhus and playing in the Alka Superliga	www.agf.dk/
AS ROMA	I:ASR	Football Club	Borsa Italiana	Italian based football club located in Rome and playing in the Serie A	www.asroma.it/
BESIKTAS	TK:BJK	Football Club	Borsa Istanbul	Turkish based football club located in Istanbul and playing in the Turkish Süper Lig	www.bjk.com.tr/en/
BILLABONG INTERNATIONAL LIMITED	A:BBGX	Apparel	Australian Securities	Originally started in 1973 as a company producing shorts for surfboarders	www.billabongbiz.com/
Borussia Dortmund	D:BVB	Football Club	Frankfurt Stock Exchange	German based football club located in Dortmund and playing in the Bundesliga	www.bvb.de/
Brisbane Broncos	A:BBLX	Rugby Team	Australian Securities	Rugby Team located in Brisbane and playing in the National Rugby League	www.broncos.com.au/
Brondby IF B	DK:BIF	Football Club	OMX Nordic	Danish based football club located in Brondby and playing in the Alka Superliga	brondby.com/
BWIN.PARTY DIGITAL ENTERTAINMENT	BPTY	Betting	London Stock Exchange	Bwin.party was formed from the merger of bwin Interactive Entertainment AG and PartyGaming Plc in March 2011. Focus on online sports betting, poker, casino and bingo. Has some of the world's biggest online gaming brands including bwin, partypoker, partycasino and Foxy Bingo	https://www.bwinparty.com/
Callaway Golf Company	U:ELY	Apparel	NYSE	Producer of golf clubs and balls.	www.callawaygolf.com/

Canlan Ice Sports Corp	C:ICE	Recreational Products & Services	Toronto Stock Exchange	Canlan Ice Sports Corp. engages in the acquisition, development, lease, and operation of multi-purpose recreation and entertainment facilities in North America	www.icesports.com/
Canterbury Park holding	@CPHC	Recreational Products & Services	NASDAQ	Canterbury Park Racetrack and Card Casino is located in Minnesota, USA. Canterbury Park is home to Live Racing, Simulcast Racing and a 24/7 Card Casino featuring Texas Hold'em, Blackjack etc.	www.canterburypark.com/
CBS Corporation	U:CBS	Broadcasting	NYSE	An American mass media corporation focused on commercial broadcasting, publishing, and television production, with most of its operations in the United States	www.cbscorporation.com/
Celtic	CCP	Football Club	London Stock Exchange	Scottish based football club located in Glasgow and playing in the Scottish Premier League	www.celticfc.net/maininde x
Central Sports Co Ltd	J:CSPT	Recreational Products & Services	Tokyo Stock Exchange	Central Sports Co., Ltd. engages in the management of sport clubs in Japan. It is involved in the promotion, marine leisure planning and management, care prevention, travel industry management and operation, fitness, design and operational advice and guidance, and sports facilities businesses	www.central.co.jp/
China Dongxiang "Kappa"	K:CHDN	Apparel	Hong Kong Stock Exchange	A leading international sportswear brand enterprise based in China. The Group is primarily engaged in the design, development, marketing and wholesaling of branded sportswear in China. Since 30 May 2006, China Dongxiang has owned all rights to the internationally recognized Kappa Brand in China	www.dxsport.com/eng/glo bal/home.php
China Sports Industry Group Co Ltd	CN:CPI	Recreational Products & Services	Shanghai Securities	China Sports Industry Group Co., Ltd. Manufacture, process and sells sporting goods. The company also involves in the development and sales of property, construction and operation of sports stadiums and sports facilities	www.csig158.com/
China Sports International Limited	T:CSIL	Apparel	Singapore Stock Exchange	China Sports International Limited designs, manufactures, and sells branded sports fashion footwear and apparel products	www.chinasportsintl.com/
Churchill Downs Inc.	@CHDN	Recreational Products & Services	NASDAQ	The company has evolved from one racetrack in Louisville, Kentucky, to a multi-state, publicly traded company with racetracks, casinos and the United States' leading online wagering company	www.churchilldownsincor porated.com/
City Sports & Recreation PCL	Q:CSRT	Recreational Products & Services	Bangkok Stock Exchange	City Sports and Recreation Public Company Limited operates a golf course and associated club house on 160 acres of land Northeast of Bangkok	-
Columbia Sportswear Company	@COLM	Apparel	Nasdaq	A United States company that manufactures and distributes outerwear and sportswear. Founded in 1938	www.columbia.com/
Comcast Corporation	@CMCSA	Broadcasting	Nasdaq	A global media and technology company with two primary businesses, Comcast Cable and NBC Universal	corporate.comcast.com/

Compagnie Des Alpes	F:CDA	Recreational Products & Services	Paris Stock Exchange	Compagnie des Alpes SA, together with its subsidiaries, engages in the operation of leisure facilities. It operates through Ski Areas, Leisure Destinations, and International Development segments	www.compagniedesalpes.com/
Daktronics Inc.	@DAKT	Recreational Products & Services	NASDAQ	An American company based in Brookings, South Dakota that designs, manufactures, sells, and services video displays, scoreboards, digital billboards, dynamic message signs, sound systems, and related products.	www.daktronics.com/en-us
Deckers Outdoor Corporation	U:DECK	Apparel	NYSE	Designs, manufactures and markets innovative, function-oriented footwear, primarily sandals, developed for high-performance outdoor, sports and recreational activities	www.deckers.com/
Dicks sporting goods Inc	U:DKS	Apparel	NYSE	An American sporting goods retailer with over 600 stores throughout the USA	www.dickssportinggoods.com/home/index.jsp
Dover Motorsports, Inc.	U:DVD	Recreational Products & Services	NYSE	Dover Motorsports, Inc. is a leading promoter of NASCAR sanctioned motorsports events whose subsidiaries own and operate Dover International Speedway in Dover, Del. and Nashville Superspeedway near Nashville, Tenn.	www.dovermotorsports.com/
Dunlop Sports Co Ltd	J:SRIS	Apparel	Tokyo Stock Exchange	A British sporting goods company that specializes in tennis and golf equipment. Dunlop was founded in 1910	www.dunlopsports.co.jp/en/
Entercom Communications Corporation	U:ETM	Broadcasting	NYSE	An American broadcasting company based in Bala Cynwyd, Pennsylvania. It is a major owner of radio stations in the United States, owning over 125 stations across 26 media markets	www.entercom.com/
ESSENDEN PLC	ESS	Recreational Products & Services	London Stock Exchange	The principal activity of the group comprises the operation of 33 tenpin bowling centers through the UK	www.essenden.com/
FENERBAHCE SPORTIF HIZMET	TK:FNR	Football Club	Borsa Istanbul	Turkish based football club located in Istanbul and playing in the Turkish Süper Lig	www.fenerbahce.org/
Finish Line	@FINL	Apparel	Nasdaq	A leading athletic retailer offering a broad selection of brand name footwear, apparel and accessories. The company operates more than 660 stores in 47 states in the US	www.finishline.com/
FITBUG HLDGS PLC	FITB	Recreational Products & Services	London Stock Exchange	Fitbug Holdings Plc is the listed holding company of Fitbug Limited, a leading provider of online coaching services	www.fitbugholdings.com/
Foot Locker, Inc.	U:FL	Apparel	NYSE	Foot Locker, Inc. is the world's leading retailer of athletic footwear, apparel and accessories	https://www.footlocker-inc.com/
Futebol Clube Do Porto	P:FCP	Football Club	Euronext Lisbon	Portuguese based football club located in Porto and playing in the Portuguese Primeira Liga	www.fcporto.pt/en/Pages/fc-porto.aspx
Galatasaray Sportif Sinai ve Ticari Yatirimlar AS	TK:GSR	Football Club	Borsa Istanbul	Turkish based football club located in Istanbul and playing in the Turkish Süper Lig	www.galatasaray.org/

Gildan Activewear, Inc.	C:GIL	Apparel	NYSE	Gildan Activewear Inc. is a manufacturer and marketer of branded clothing, including undecorated blank active wear such as t-shirts, sport shirts and fleeces	www.gildan.com/
GOALS SOCCER CENTRES	GOAL	Recreational Products & Services	London Stock Exchange	A British 5 a side football center operator with more than 40 locations in the UK	https://www.goalsfootball.co.uk/
GVC HLDGS PLC	GVC	Betting	London Stock Exchange	A leading provider of B2B and B2C services to the online gaming and sports betting markets	www.gvc-plc.com/
Head N.V.	O:HEAD	Apparel	Vienna Stock Exchange	HEAD BV is a leading global manufacturer and marketer of premium sports equipment and apparel	www.head.com/
Hibbett Sport	@HIBB	Apparel	Nasdaq	Hibbett Sports is a sporting goods retailer specializing in footwear, equipment and apparel	www.hibbett.com/
HWA AG	D:H9W	Sports team	Frankfurt Stock Exchange	HWA Team is the motor racing team of HWA AG, a German company, based in Affalterbach. They also develop and build vehicles and components for Mercedes-AMG	www.hwaag.com/
Inmobiliaria Sport Francais SA	CL:SPF	Recreational Products & Services	Chile Stock Exchange	Inmobiliaria Sport Francais S.A. engages in the real estate operations for constructing and installing sport fields and sport establishments used for instruction and physical education	-
International Speedway Corporation	@ISCA	Recreational Products & Services	NASDAQ	International Speedway Corporation (ISC) is a corporation whose primary business is the ownership and management of NASCAR race tracks	www.internationalspeedwaycorporation.com/
JD SPORTS FASHION PLC	JD.	Apparel	London Stock Exchange	JD Sports Fashion plc is the leading retailer and distributor of branded sportswear and fashionwear	www.jdplc.com/
Juventus	I:JUVE	Football Club	Borsa Italiana	Italian based football club located in Turin and playing in the Serie A	www.juventus.com/it/
LADBROKES PLC	LAD	Betting	London Stock Exchange	Ladbrokes plc is a leader in the global betting and gaming market with annual Group revenues of more than £1 billion.	www.ladbrokesplc.com/
Li Ning	K:LNIN	Apparel	Hong Kong Stock Exchange	A global leader of sports apparel manufacturing, especially within the Badminton and Basketball segment	li-ning.dk/
Lululemon Athletica	@LULU	Apparel	NASDAQ	Lululemon makes technical athletic clothes for yoga, running, working out etc.	shop.lululemon.com/?
Mizuno Corporation	J:MIZN	Apparel	Tokyo Stock Exchange	A Japanese sports equipment and sportswear company, founded in Osaka	corp.mizuno.com/en/
Nike, Inc.	U:NKE	Apparel	NYSE	A global leader of sports apparel manufacturing and retailing, and has dominated the market together with Adidas during the last 30 years	news.nike.com/
OL Groupe	F:OLG	Football Club	Paris Stock Exchange	Olympique Lyonais is a French football club located in Lyon and playing in the French Ligue 1	www.olweb.fr/en/

PADDY POWER	PAP	Betting	London Stock Exchange	An Irish bookmaker. Offline it conducts business through a chain of licensed betting shops in Ireland and the United Kingdom, and by operating Ireland's largest telephone betting service. Online it offers sports betting, online poker, online bingo, online casino games and spread betting	www.paddypower.com/bet
Parallel Media Group PLC	PAA	Advertising	London Stock Exchange	Communications agency with specialty in Sport and Entertainment. Traded on the London Stock Exchange	www.parallelmediagroup.com/
PARKEN SPORT & ENTERTAINMENT	DK:PSE	Football Club	OMX Nordic	F.C. Copenhagen is a Danish football club located in Copenhagen and playing in the Danish Alka Superliga	parken.dk/
Puma AG	D:PUM	Apparel	Frankfurt Stock Exchange	A major German multinational company that produces athletic and casual footwear, as well as sportswear	eu.puma.com/
Quiksilver, Inc.	U:ZQK	Apparel	NYSE	Designs, produces and distributes clothing, accessories and related products for young-minded people and develops brands that represent a casual sense of style	www.quiksilverinc.com/
Siam Sport Syndicate PCL	Q:SISS	Advertising	Bangkok Stock Exchange	Sport publishing and advertising company	www.siamsport.co.th/
SILKEBORG	DK:SIF	Football Club	OMX Nordic	Danish based football club located in Silkeborg and playing in the Alka Superliga	www.silkeborgif.com/
Skechers U.S.A., Inc.	U:SKX	Apparel	NYSE	An American shoe manufacturer focused on high performance and lifestyle shoe making	www.skechers.com/
SKISTAR B	W:SKIS	Recreational Products & Services	OMX Nordic	Owns and operates ski destinations such as Sälen, Äre and Vemdalen in Sweden together with Hemsedal and Trysil in Norway.	www.skistar.com/sv/corporate/
SKY PLC	SKY	Broadcasting	London Stock Exchange	Sky plc is a British-based pan-European satellite broadcasting, on-demand Internet streaming media, broadband and telephone services company	https://corporate.sky.com/
Societa Sportiva Lazio SpA	I:SSL	Football Club	Borsa Italiana	Italian based football club located in Rome and playing in the Serie A	www.sslazio.it/
Speedway Motorsports, Inc.	U:TRK	Recreational Products & Services	NYSE	Owns Atlanta, Bristol, Las Vegas, Lowe's and Texas Motor Speedways plus the Performance Racing Track	https://www.speedwaymotorsports.com/
Sport Lisboa e Benfica-Futebol SAD	P:SLB	Football Club	Euronext Lisbon	Portuguese based football club located in Lisbon and playing in the Portuguese Primeira Liga	www.slbenfica.pt/
Sportech PLC	SPO	Betting	London Stock Exchange	Sportech is one of the world's leading pool betting operators and technology suppliers	www.sportechplc.com/home
Sporting Clube de Braga	P:SCB	Football Club	Euronext Lisbon	Portuguese based football club located in Braga and playing in the Portuguese Primeira Liga	www.scbraga.pt/
Sporting Clube De Portugal - Futebol SAD	D:SCG	Football Club	Euronext Lisbon	Portuguese based football club located in Lisbon and playing in the Portuguese Primeira Liga	www.sporting.pt/english/english_hp.asp

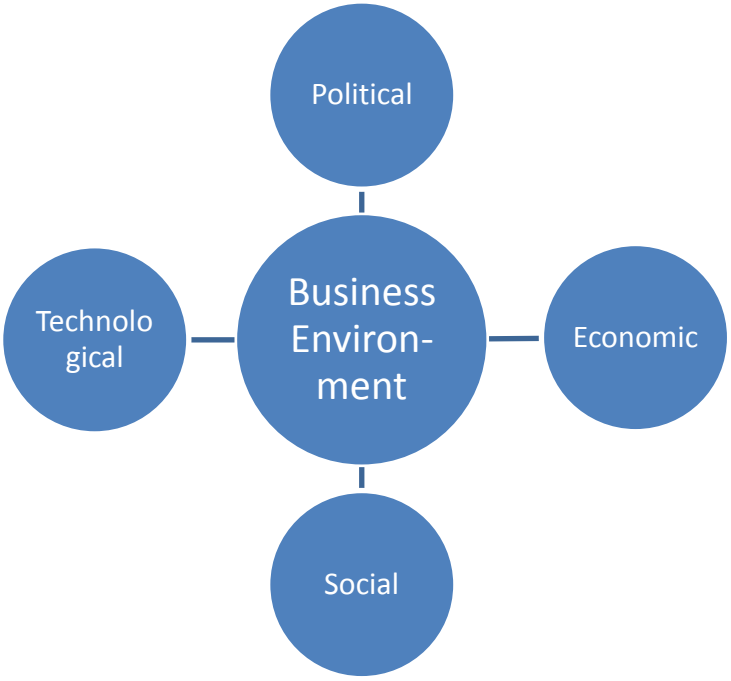
Sports Direct International PLC	SPD	Apparel	London Stock Exchange	Sports Direct is the UK's leading sports retailer by revenue and operating profit, with approximately 400 stores across the UK	www.sportsdirectplc.com/
Sports Pouch Beverage Co Inc	@SPBV	Recreational Products & Services	NYSE	Sports Pouch Beverage Company, Inc. was established for the specific purpose of producing pull-push spout technology liquid pouch packaging as well as utilizing this technology for the development and production of new beverage brands	www.sportspouchinc.com/
SPORTSWORLD MEDIA GROUP	SWD	Broadcasting	London Stock Exchange	Sportsworld Media Group is principally engaged in global sport-related marketing, event management, and television production and distribution	sportsworldmedia.net/
TANDEM GROUP	TND	Recreational Products & Services	London Stock Exchange	Tandem Group is a British-based designer, developer and distributor of sports and leisure products	tandemgroupplc.co.uk/
Town Sports International Holdings Inc	@CLUB	Recreational Products & Services	Nasdaq	The largest owner and operator of fitness clubs in the Northeast and Mid-Atlantic regions of the United States	investor.mysportsclubs.com/
Under Armour, Inc.	U:UA	Apparel	NYSE	A sports apparel manufacturer with focus on training, running, yoga and hunting	https://www.underarmour.com/
Unibet Group, plc	W:UNIB	Betting	OMX Nordic	Online gambling company offering sports betting, poker, casino and bingo	www.unibetgroupplc.com/
Vail Resorts, Inc.	U:MTN	Recreational Products & Services	NYSE	Vail Resorts, Inc. runs four ski resorts in Colorado three in Lake Tahoe, two in Utah, one in Minnesota, one in Michigan, one in New South Wales, Australia and a summer resort in Wyoming.	www.vailresorts.com/Corp/index.aspx
WEBIS HOLDINGS PLC	WEB	Betting	London Stock Exchange	Webis Holdings plc, through its subsidiaries, engages in the gaming and technology sectors worldwide. It operates betinternet.com, a sportsbook portal that offers betting opportunities on sports, casinos, poker, and games through its Website and mobile platforms	www.webisholdingsplc.com/
WILLIAM HILL PLC	WMH	Betting	London Stock Exchange	William hill, the home of betting, is one of the world's leading betting and gaming companies and trusted brands in the industry	www.williamhillplc.com/
World Wrestling Entertainment, Inc.	U:WWE	Sport Organization	NYSE	Organization producing major wrestling events in the USA	www.wwe.com/
Yue Yuen International Holdings Ltd	K:YUEN	Apparel	Hong Kong Stock Exchange	Yue Yuen is a leading original design manufacturer / original equipment manufacturer (ODM/OEM) for major international brands such as Nike, Adidas, Reebok, ASICS, New Balance, Puma, Under Amour, Converse, Merrell, Salomon and Timberland. It makes athletic and casual outdoor shoes as well as sandals	www.yueyuen.com/
AALBORG BOLDSPILKLUB	DK:AAB	Football Club	OMX Nordic	Danish based football club located in Aalborg and playing in the Alka Superliga	www.aabsport.dk/

5.8 PEST analyses

In this section a PEST analysis framework will be applied to the sporting, the gambling (sportsbetting) and the sport equipment manufacturing and retailing industry. This is done to shed light on some of the most important and dominating industries in relation to the future prospect of SRIF.

The Pest framework involves an assessment of four macro-environmental factors to describe the current competitive state of the company or industry in question. The four factors are Political, Economic, Social and Technological.

Figure 4 – The PEST Framework - Source: Dibb, et al., 2006



5.8.1 Sports industry

5.8.1.1 Political

Sport is often praised as being non-political and a way to bridge conflicting interest. That is however a truth with great modifications. More and more sport federations are today extremely political in everything from the way they are governed to their way of influencing politicians in regards to stadium properties, tax laws etc. An example being the Danish "Forskerordning" (Skat, 2015) that previously were used to give foreign footballers beneficial tax brackets.

Sport is big business, a point we will come back to in the coming economic section and "politicians" and professionals have risen to the most powerful and influential posts in the industry, creating more streamlined organizations with more monetary focus (SportBusiness International, 2007). This has however also created skepticism amongst fans towards these politicians. This can be seen in the cases of potential collaboration between the UCI (Union Cycliste Internationale) and Lance Armstrong to cover up positive doping tests or the ongoing investigation of high ranking FIFA (Fédération Internationale de Football Association) executives in their possible involvement in corruption (BBC, 2015).

Another political obstacle that frequently has to be resolved is the question of worker rights and the battle between employers (teams) and unions (players). Especially the NHL has had some extremely negative consequences (one and a half canceled seasons) during the last 15 years. But other sports have also had trouble combining clubs' and players' interest. A reason for the more frequent employment rights controversies could be the clubs' attempt to do something about the great general deficit that are seen in most sports, a topic discussed in section 5.5.

Despite these scandals, and controversies sports are still growing revenue wise (AT Kearney, 2014) (PwC, 2011), which suggest that all publicity is good publicity, a statement we will look closer at in the next section.

5.8.1.2 Economic

Sport and the entertainment industry have begun a closer collaboration during the latest years in connection to the switching revenue focus in sports from gate revenue to sponsorships and media rights (PwC, 2011). This collaboration has increased the popularity for especially the major sporting events, whereas the minor have been struggling a bit more for attention. The overall popularity and revenues for sports have however increased significantly despite the tough economic conditions (PwC, 2011), which correlates greatly with Rick Dudley's notion that sports fans are less likely to let their spending behavior be affected during economic crises (SportBusiness International, 2009).

Looking more specifically at some of the bigger markets like North America and Europe, there seems to be very positive growth rates for sport in general, and the bigger sports leagues in particular. If we start by focusing on the English Premier League there seems to be, as previously discussed, no ceiling on the growth rate for revenues, especially the Media rights.

"Despite operating in a challenging economic environment, English club football's profile, exposure and increasingly global interest have continued to drive revenue growth, allowing the

clubs to invest in top quality playing talent who in turn helps to boost the league's popularity and support further revenue growth, completing a virtuous circle. The Premier League continues to be a huge success in this respect".

(Deloitte, 2013)

And as previously highlighted, not only the English Premier League, but football leagues across Europe are seeing record breaking deals (SportBusiness International, 2013) (Kjærgaard, 2012) (AT Kearney, 2014), both in terms of media rights, but also when it comes to sponsorship deals. Taking the numbers from the AT Kearney report (2014), there seems to be positive growth rates in the sport industry as a whole.

Moving on to the other dominating market, namely the North American one, there also seems to be great future prospects for the sports industry. Especially the media rights and sponsorship deals, which according to PwC (2014) are expected to have a respectively 9.1% and 4.8% compounded annual growth rate (CAGR). Gate revenues and merchandising does however not have as positive outlooks, leaving the total expected CAGR for the North American sport industry on 4.5%.

As outlined, the two dominating markets have positive outlooks, and even though larger growth rates are currently realized in other parts of the world *"... the growth opportunities in the traditional developed markets are far from over"* (PwC, 2011). There is however challenges, such as rising player costs which make the majority of professional sport clubs run with a deficit, as previously discussed. The increasing complexity of balancing all stakeholder opinions ranging from fans and sponsors, to broadcasters and governing bodies is another challenge. Especially fans seem to feel a great deal of involvement and ownership with their club, restricting executives from making decisions based solely on economic matters (Hyatt, et al., 2013). However, this fan involvement is extremely valuable to the popular sports, which are getting more and more broadcasting rights (TV and digital), whereas the less popular sports are getting less attention (SportBusiness International, 2014).

5.8.1.3 Social

Sport is something that includes all generations making it very unique. People from all social classes identify as sports fans and therefore the most noteworthy demographic observation that can be mentioned, is perhaps that most sports fans are male (Andersen, 2015).
There has however been social change in the perception of sport and its actors. Athletes are being

idolized like never before, and media attention is enormous. At the same time sponsors expect both teams and athletes to behave ethically correct and be good ambassadors for their respective brand. But it's not only sponsors who expect athletes to be on their best behavior constantly. League officials and executives are also monitoring them constantly and are quickly to punish any wrong doings. But not all athletes are good role models and as they are constantly in the media's focus, some of them are bound to make mistakes. This is however not all bad since the politically correct answer is not always what spectators and TV-viewers are longing for. Some athletes increase their popularity by showing real emotions and are not afraid to stand out for better or worse. A good example is Nicklas Bendtner's cult status despite his lack of credentials within football (SBS Discovery Media, 2015). In this regard social media websites like Twitter, Facebook and Instagram have become massively popular (PwC, 2011), a point we will get back to in the technological section. The governing bodies of sport however have to balance pleasing the sponsors by schooling athletes and pleasing fans by not schooling athletes too much.

Another trend is the blend of sport with entertainment, with the example of Katy Perry performing at the latest Super Bowl halftime show. On the positive side, it makes the show appeal to a broader segment, but some purist sports fans may believe that all the entertainment around the game destroys the overall experience (PwC, 2014). The recent Super Bowl must however have done something right as it became the most watched show in U.S. history (Patra, 2015), making the case for combining entertainment and sports a compelling one.

5.8.1.4 Technological

The technological progress affects multiple aspects of the sporting industry. Firstly, it has together with increasing professionalism in sport affected how athletes go about their training and the increasingly greater scientific approach taken to find the gains the makes an athlete separate from the pack. Secondly, the spectating aspect of sports has dramatically changed with the numerous platforms available to broadcasters (SportBusiness International, 2014). Sports fans nowadays have more than the one option of purchasing tickets if they want to experience an event or a game; they can watch more and more games on TV, stream it online, or follow it through real time updates through their smartphone. With the availability of individuals to access sport matches and events everywhere, broadcasters can reach fans globally, increasing revenue dramatically (SportBusiness International, 2007) (SportBusiness International, 2013). At the same time fans have the opportunity to communicate with each other and their respective team through social media, giving fans a much deeper insight into the world of sports. The almost unlimited access to sports can

however outwash the product and make it harder for smaller niche sports to make themselves relevant, as availability of the bigger sports dominate the media coverage. At the same time, fantasy sport leagues have become extremely popular, a feature which to some extent and for some individuals have diminished the importance of the actual game, and moved focus to the individual competition between players in the fantasy league (Hyatt, et al., 2013).

5.8.1.5 Summary

Sport seems to have a bright future, both in the more traditional markets like Europe and North America, but also in the industry as a whole. Particularly sponsorship deals and media rights revenues realized have been growing dramatically during the last years, and are believed to continue. The sporting industry also seems to be able to sustain scandal and controversy as long as the fundamental competitiveness and excitement is present, suggesting a rather robust industry. There is however pitfalls, such as the increasing complexity of balancing stakeholder incentives with one another, in specific sponsors' vision for corporate brand and the athletes' behavior in this regard. But the increasing availability of athletes and sport clubs has given the industry great growth opportunities. Matches are distributed through the media; both online and on traditional platforms, and the everyday life of athletes can be followed through social media.

5.8.2 Sports equipment

5.8.2.1 Political

Most sports manufacturers have moved their production to especially Asian countries where labor is cheap and the legislation towards worker safety and working hour limits etc. are less strict than in most western countries. The companies however face the risk of brand dilution if the public believes that it exploits these cheap solutions too much. At the other side there is a dilemma for the governments in question about how good employment conditions should be, as aiming too high will drive business out of the country into another region (Banjo, 2014).

The political landscape in a lot of these production countries is uncertain, but there remains a great many options for where the sports equipment manufacturers can place their factories. Furthermore, transportation costs seems on an ever-declining trend (Hummels, 2007) and thus it appears likely that the big sport manufacturers will continue to have the bargaining power.

5.8.2.2 Economic

The amount of substitutes for buying athletic wear is immense. Anything from other clothing objects to different hobby products such as kitchen equipment, books, computer games, tools etc. are all substitutable to spending on sports apparel, as it does not qualify as necessities. So especially in tough economic times, consumers will have to prioritize between these different products. The sports equipment industry have however shown positive growth rates across the globe despite the last 5 years tough economic conditions, and is believed to grow further in the near future (Marketline, 2014). Similar positive outlooks are seen in the broad retail apparel industry, which could be a positive sign for the sports apparel industry (Marketline, 2014). Especially emerging markets such as China and India are attractive in the coming years since more consumers get more disposable income and time to both buy and use sports equipment.
However, from a retail point-of-view competition is fierce, since most competitors sell the same products and loyalty is mainly directed towards the manufacturing brands (Marketline, 2014).

Overall both the sports apparel and equipment industry follow the general trend of the sporting industry, which as seen in the analysis of the industry just keeps growing. On top of that it shows significant robustness during economic recession, which limits riskiness of the industry, and makes it attractive to investors.

5.8.2.3 Social

The industry has seen its fair share of public unrest due to industry leaders' exploitation of cheap labor in third-world countries with no regard for worker safety (Banjo, 2014). Therefore it has become a two-edged sword, between controlling cost and maintaining safe working conditions, where especially Nike has had difficulties in finding the right balance. Nike has however taken steps at improving worker conditions over the last 15 years, and has released the names and locations of all the factories in order to be more transparent and provide a good example for competitors to follow, but there is still a great deal of issues (Banjo, 2014).

Big sporting goods manufacturers like Adidas and Nike have blurred the line between sportswear and normal wear through the last 30 years. These manufacturers are as big a part of defining new fashion trends as the major fashion houses, especially in the shoe segment.
The sporting companies' original consumer segment, active consumers, still remains key, since people still need new running shoes, soccer boots or golf clubs when the old ones have been worn

out, placing these products higher up the necessity ladder than new fashion clothes, furniture and other luxury items.

5.8.2.4 Technological

Tennis racquets, soccer boots, football helmets etc. have dramatically transformed during the last 50 years and continuing technological advancements are realized continuously. This has not only radically changed sports into more fast-paced activities but also created a demand among consumers in the western world to keep up with the newest technology, thus investing in new equipment more often than one can wear it out. However, it also creates a constant need for manufacturers to constantly reinvent equipment and to be able to have the newest technology on the shelves for consumers to purchase.

5.8.2.5 Summary

The sports equipment industry is growing and has shown correlation with the sporting industry making it a robust investment opportunity especially in economic downturns. The heavy market weight of household brands such as Nike and Adidas is believed to continue in the western markets, with the rapidly increasing Chinese market producing some of its own players for the industry such as Yue Yuen and Li Ning.

5.8.3 Gambling industry

5.8.3.1 Political

Gambling is a controversial industry and different legislative frameworks are in place, depending on the geographic region, to control it. In Islamic regions gambling is banned by law all together (Rosenthal, 1975) and in the USA it is only legal and operable in 4 states, with Nevada being the most well-known (Anderson, 2012). Most betting companies are thus European and Asia-pacific based, and with only European gambling companies in our investment universe, this analysis will be centered on European legislation. The European Court of Justice (ECJ) has put a charter forward stating that restrictions on gambling should:

- Be justified by imperative requirements in the general interest,
- Be suitable for achieving those objectives,
- Not go beyond what is necessary in order to achieve this.

(Papaloukas, 2012)

This has created a move away from state monopoly in EU member states (France, Sweden, Denmark etc. (Kaburakis, 2012)) into a more open and liberalized gambling market, still controlled internally in the respective country. This is supposed to protect the individual player and diminish the risk of illegal gambling, economic fraud and gambling related crime. There is however still tremendous variability in the market, which creates political uncertainty and a possible need for an all embodying European gambling model (Kaburakis, 2012), which could help the problems of match fixing which will be discussed later.

5.8.3.2 Economical

The global online gambling industry has had tremendous growth over the last 5 years, averaging 9.5% p.a. amounting to a value of $ 35.3 billion in 2013 (Marketline, 2014) despite the tough economic conditions in connection to the global financial crisis. This growth is expected to average 9.6% over the coming 5 years, which suggests it to be a prosperous industry, not yet matured (Marketline, 2014). Sport betting is the largest contributor to the total value of gambling with 45.8%, signaling that sports betting could be the key driver of the industry. The geographic segmentation shows that almost half the value of the industry is accounted for in Europe. More surprising is it perhaps that Asia-Pacific accounts for around a third of the value and the Americas only less than 20% due to the previously discussed legislative framework in the US, despite their substantial financial power.
Additionally, the industry shows a high degree of concentration and therefore competitiveness, highlighted by the fact that the four biggest industry players only account for 9.5% of total value (Marketline, 2014).

The gambling market has now become so great that match fixing is becoming a bigger and bigger threat to both the sports betting industry and sports in general. Therefore, sports associations across the board have banned gambling on games that players are actively involved in, created hotlines to indicate suspicious behavior and state inquiries about possible match fixing. Despite this, more and more incidents seem to see the light of day, even at top level sports such as the recent scandal about Nikola Karabatic's (World's best Handball player in 2014) possible involvement in match fixing. Match fixing though, is still unheard of at the financial top performing team sports, because of the massive wages for players, diminishing the incentive. It is crucial to outline that both gambling

companies and the sport industry wants a clean sport and both have big stakes in reaching that goal (Roberts, 2010).

5.8.3.3 Social

The gambling industry is often compared to the smoking and alcohol industry in the regard that it creates a negative externality, in this case gambling addiction (Lund, 2015). Therefore most well-established companies have tools and guidelines to prevent this and educate their personnel in good ethics. This protects consumers from themselves but also protects the corporate brand from public uproar.

Furthermore, some countries still have government owned gambling companies, which Danske Spil in Denmark is a prime example of. These sorts of companies give back some of their profits to the public, such as sport clubs and welfare projects, health care etc. (Kaburakis, 2012). This creates an incentive for consumers to bet through these companies as losses are not just realized by shareholders.

Other features that separate private owned companies from the state controlled counterparts, is the aggressiveness of advertising and the focus on responsibility. Huge discounts and cash deposits to new customers under more or less complex schemes separate at least Danske Spil from its private competitors in order to create a healthier and more transparent gambling experience (Lund, 2015). The advertising campaigns however symbolize that there still is a lot of uncaptured market share either from new gambling customers or due to a lack of loyalty schemes in the industry thus capturing customers from competitors (Lund, 2014).

5.8.3.4 Technological

The gambling industry has immensely transformed in connection to the last decade's exponential development inside the phone and tablet industry. Where gambling used to be mainly centered on brick-and-mortar casinos and sports-betting kiosks, today's reality is far more complex. The amount of sports-betting possibilities has increased tenfold, from only being able to bet on the winner or final score to having the option of betting on corner kicks, red and yellow cards, substitutions, possession, interval for goal scoring and the ability to close a bet before the pre-set closing time. This is just some of the possibilities and only in soccer, which gives a good indication of the growth. Firstly, this wealth of options has only become possible due to computer algorithms that based on statistical data are able to determine the "right" price on these betting options. Secondly, the movement of betting from a physical location to a virtual online one has made it significantly

easier for consumers to place bets. Consumers demand betting in real-time and Danske Spil's sports betting hub "Oddset" has seen 50% of its revenue stream come from Mobile gambling, a figure they expect to increase (Lund, 2015). Therefore, big focus has been put into the development of apps and software for these platforms to satisfy the increasing demand from customers.
At the same time all these new channels have created a need for companies to have well developed IT-infrastructure that provides quick and safe access to customers (Marketline, 2014).

5.8.3.5 Summary

The gambling industry is rapidly expanding and still far from reaching maturity. It has realized significant growth through mainly sports betting on an increasing number of online platforms, making the consumer able to place bets in real time, thereby increasing the thrill of the sport spectator experience. Restrictions on gambling have been loosened in the last decade, particularly in Europe, enabling the high growth, and shedding light on the potential of industry in the US. Gambling is however still fighting with the negative externality of addiction as diluting the brand and with the increasing problems with match fixing which not only threatens the sports betting industry but also sports in general.

5.9 Summary

Activities were defined through the four criteria of activities, where three of them were accepted as part of sports. Secondly, sports involvement had three distinctive involvements, which all are accepted as relevant to SRIF. The sports network theory then outlined the ties and interconnectivity between key actors in the network. Especially media and sports seem highly dependent on each other.

Sport has its fair share of challenges; one of them being the general lack of focus on economic stability. This is due to the conflicting interest of sport clubs between winning and running a profitable business. Another complication for sports, especially in Europe, is that of competitive balance. Studies have shown that the higher the competitiveness, the more interest from fans and media thus creating a counterbalancing aim for the individual club.
The sport network is however unique in its characteristic, as few other industries have consumers as loyal as sports fans. The value created by sport is of such magnitude that it affects the entire sport

network. Thus, while sport in itself may not be profitable, the surrounding network is. Based on this, there appears to be an opportunity of investing in the sport network.

85 assets were selected to be part of the SRIF stock universe due to their fit with the restrictions and data availability. The final PEST analyses showed positive outlooks for all three crucial industries in the sport network. There were also challenges ahead, but on an aggregate level, the sport industry and surrounding network is believed to have a profitable future.

6.0 Portfolio Theory

After our discussion about the market opportunity and sports network we will now focus our attention to portfolio theory, to puzzle the last piece together in relation to our overall aim of putting together a competitive Sport-Relations Investment Fund. In this regard it is imperative that the reader knows what set of guidelines and what reference points there has been used for this analysis. Therefore we will discuss some of the most crucial statistical factors and financial valuation tools which the following theories of portfolio optimization will be based upon.

6.0.1 Methodology

Through this section we have investigated several different portfolio theories, and based on academic books, articles and journals, found through the CBS library, we have summarized those most relevant to the aim of this thesis. Furthermore, the statistical tools needed to evaluate portfolios have been briefly summarized, together with a small discussion of stock return distributions. These theories and concepts are believed to be relevant to the aim, and valid in the sense that even though some of the assumptions made in portfolio theory might not correspond a hundred percent with reality, they are what constitute the academic framework within finance.

6.1 Statistical and financial tools

Stock prices and therefore returns are extremely unpredictable. One way to describe these swings in returns is through the tools of statistics, which therefore will be outlined in the following section. We believe the measures to be well-known to the reader of this thesis, and will therefore only give a

brief review, highlighted by the fact that the scope of this thesis does not include any arguments of proof for these tools. We will however give a summary of how our asset returns have been distributed in order to make the reader more knowledgeable about our data.

6.1.1 Standard deviation (σ)

The most used tool in modern finance when it comes to risk assessment is standard deviation. It is defined as the square root of the variance (σ^2), which in turn is the expected value of the squared deviations from the average return (Bodie, et al., 2011). Firstly, this means that every return is subtracted the average return, then squared and added up. Secondly, the sum is divided by the number of observations minus 1. Lastly, the number is squared, which gives us the standard deviation. The calculations are shown on the following formula:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{N}(X_i - \mu_i)^2}{N-1}}$$

Where X_i is the observed value, μ is the average and N is the number of observations.

This standard deviation tells us how the returns are distributed if we assume that they are normally distributed around a mean, a feature we will come back to. Furthermore, from statistics, we know that approximately 68% of all observed values will lie within one standard deviation and about 95% within two (Agresti & Franklin, 2009).
Applied to our historical returns, we will see a higher standard deviation from the more volatile stocks, and vice versa. Taking on the specs of the rational investor, we will all else equal prefer a low volatility to a higher one as it symbolizes a more even distribution.

6.1.2 Covariance

Covariance is a measure of how much stock prices move together, and is defined as the sum of the differences between stock A's historical return and average return, multiplied with stock B's historical return and average return, and then multiplied by sample size minus one.

$$Cov(A,B) = \frac{\sum_{i=1}^{N}\{(A_i - \bar{A}) * (B_i - \bar{B})\}}{N-1}$$

Where A is stock A's return, $\bar{A}$ is the Stock A's average return and N is the number of observations.

6.1.3 Correlation(ρ)

The correlation coefficient symbolizes the linear relationship between two stocks and is always between minus 1 and 1, where a perfectly negative correlation of -1 means that stock A has a 10% return every time stock B has -10% return and a perfectly positive correlation of 1 means that all returns of A and B are similar. Lastly a correlation of 0 means that A and B's stock return are completely independent. The correlation(ρ) is calculated with the help from the previous discussed variance and covariance:

$$\rho_{AB} = \frac{Cov(A,B)}{\sigma_A \sigma_B} \leftrightarrow Cov(A,B) = \rho_{AB}\sigma_A\sigma_B$$

(Bodie, et al., 2011)

From a portfolio point of view, the correlation coefficient is used to calculate the overall variance of a portfolio as the two-assets variance formula is:

$$\sigma_p^2 = w_A^2\sigma_A^2 + w_B^2\sigma_B^2 + 2w_A w_B \sigma_A \sigma_B \rho_{AB}$$

Where *w* are the weights for respectively asset A and B.

With that in mind and because one of the main goals for most portfolios is to reduce risk, stocks with low or in some cases negative covariance is often selected, a feature which is even more crucial when a great number of assets consists the overall portfolio.

6.1.4 Beta

Another way to measure the volatility of a stock or an entire portfolio is by measuring the beta of a stock (Bodie, et al., 2011). Beta originates from the CAPM model and is used to measure the systematic risk of a stock or portfolio in comparison to the market (Gitman & Joehnk, 2003). The most intuitive way to explain what beta can be used for, when analyzing a stock or portfolio, is to think of beta as the measure of how much of a stock's volatility is identical with the volatility of the market. A stock beta of 1 means that if the market increases/decreases by 1% then the given stock also increases/decreases by 1%.

The higher the beta the more volatile the stock is considered to be. This can be explained by a brief example: Stock 1 has a beta of 0.5 and stock 2 has a beta of 3. Stock 1 only experiences half the

growth of the market during upswings but, conversely, it also decreases less than the market does during downswings, meaning that the stock's deviation from its average return is comparatively low. The opposite is true for stock 2 since this stock will have much higher growth than the market during upswings but should realize losses 3 times that of the market.

The downside of beta as a risk measure is that it only shows volatility with regards to the market and therefore tells little about the anticipated independent deviation of returns. Thus it is common to use both standard deviation and beta when assessing the risk of a portfolio (Hirt & Block, 2006).

Beta can be calculated using the following formula:

$$Beta = \frac{cov(R_i, R_m)}{var(R_m)}$$

It is clear from the formula above that beta is a direct measure of the connection between the risk of a stock and the risk of a market.

6.1.5 Sharpe ratio

Just as standard deviation is the most acknowledged and used measure of risk, the Sharpe ratio is the most used reward-to-volatility ratio in investment theory (Bodie, et al., 2011). The ratio was developed by William F. Sharpe (Sharpe, 1966) and is a measure of the trade-off between the excess return and the standard deviation. The Sharpe ratio is still applied by most mutual funds because of its simplicity and easy comparison for investors. This thesis will also apply the Sharpe ratio in order to find the portfolio with the highest reward-to-volatility ratio.

The formula for The Sharpe ratio is:

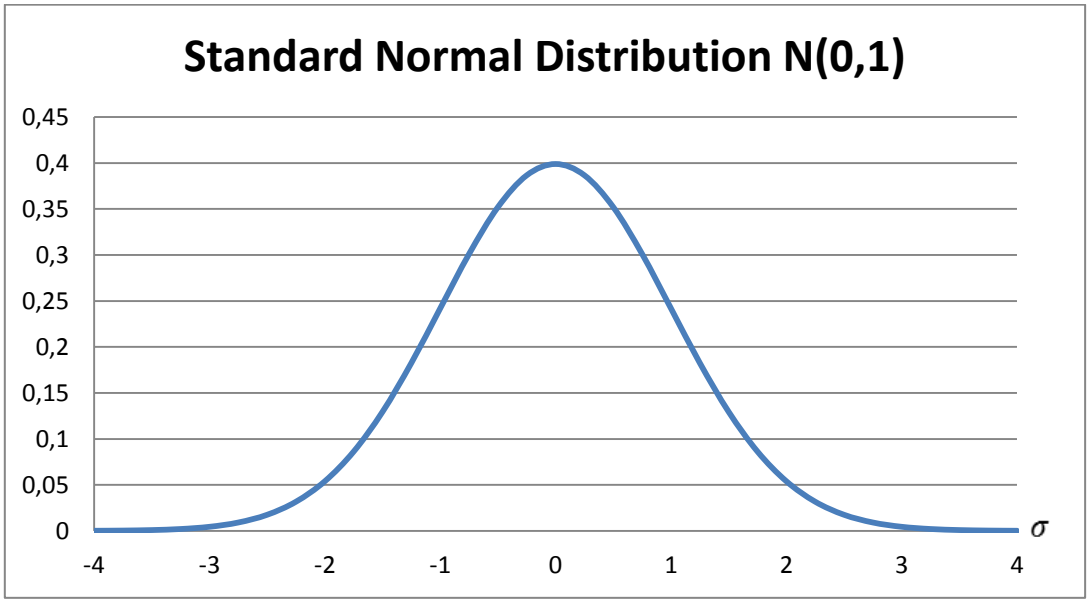
$$S = \frac{R_p - R_f}{\sigma_p}$$

Where R_p is the return of the portfolio, R_f is the risk-free rate and σ_p is the standard deviation of the portfolio.

6.1.5 Normal Distribution

The Normal distribution is a statistical measure of a probability distribution for continuous random variables centered around a mean, where stock prices is a good example and the reason for this inclusion. The classic normal distribution $N(\mu, \sigma)$ has a mean of 0 and a standard deviation of 1 and is often referred to as "bell-shaped" when graphed, see Graph 1 (Agresti & Franklin, 2009). Most observations are clustered around the middle and the "tails" (most extreme values of the distribution) are therefore short.

Graph 1 – Normal Distribution

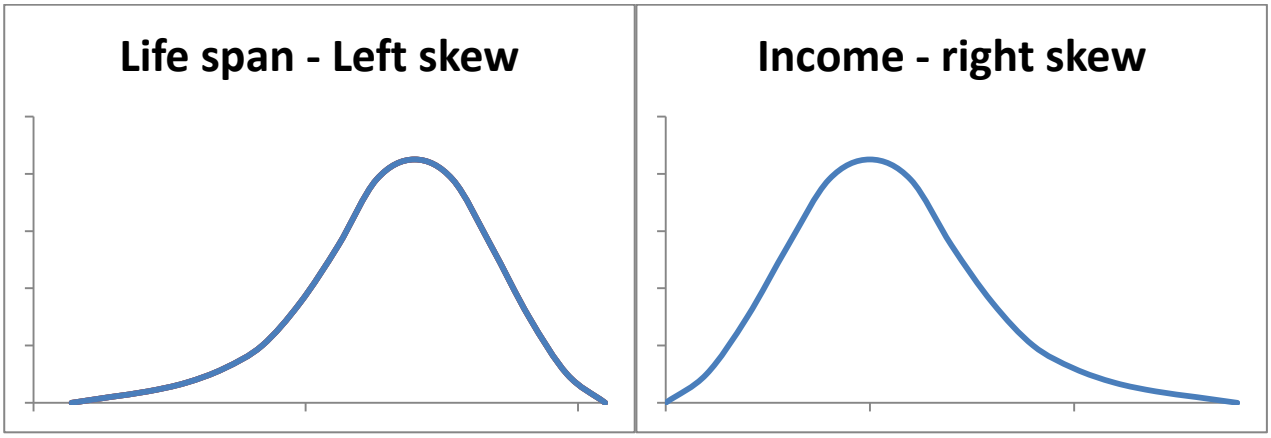


The distribution is symmetrical and the Empirical Rule thus states that respectively 68% of observations fall within 1 standard deviation, 95.4% within 2 standard deviations, and 99.7% within 3 standard deviations (Agresti & Franklin, 2009) with an equal amount to either side of the mean.

6.1.6 Skewness

Not every distribution is normally distributed and in this relation skewness is used as a measure of how asymmetric the distribution is and to which side the skewness is pointed. Some good examples of skewed distributions are life span (skewed to the left, meaning a longer left tail) and income distribution (skewed to the right, meaning a longer right tail), which can be seen in Graph 2 (Agresti & Franklin, 2009).

Graph 2 – skewed distributions



A left skewed distribution means that mean is located left of the median. The opposite is applicable for a right skewed distribution. When calculated, a positive skewness symbolizes a right-skewed distribution and vice versa (Aczel & Sounderpandian, 2006).

6.1.7 Kurtosis

Even though two distributions have the same mean, variance and skewness they could still look completely different. In relation to this, one can measure the Kurtosis of the distribution which describes the peakedness (Aczel & Sounderpandian, 2006). The standard normal distribution has an Absolute Kurtosis value equal to 3 and a relative Kurtosis equal to 0 as relative Kurtosis is simply absolute Kurtosis minus 3. The formula for Kurtosis is:

$$\gamma_2 = E\left(\frac{Y_t - \mu}{\sigma}\right)^4$$

A kurtosis value significantly different from 3 therefore suggests a non-normal distribution. This links with the next section where our 85 assets will be tested for skewness and kurtosis relative to a standard normal distribution.

6.1.8 The Robust Jarque-Bera test

In order to determine whether asset returns are normally distributed or not, the Robust Jarque-Bera (RJB) test is a useful tool. The original Jarque-Bera test was published in 1980 and improved in 2009 (Gel & Gastwirth, 2008). It tests the goodness of fit with the normal distribution from the following formula:

$$RJB = \frac{n}{6}(Skewness)^2 + \frac{n}{64}(Kurtosis - 3)^2$$

$$RJB > \chi^2_{critical}\ rejects\ the\ null\ of\ normal\ distribution$$

Where *n* is the number of observations (Gel & Gastwirth, 2008).

The only difference between the original test and the robust test is that the *n* used to be divided by 24 and not 64.

The test statistic has a Chi-squared distribution with 2 degrees of freedom, one for skewness and one for kurtosis. From a critical value table we find that for a probability of larger values of 0.05 the critical value is 5.99. This implies that finding a RJB value of more than 5.99 indicates that the stock return is not normally distributed.

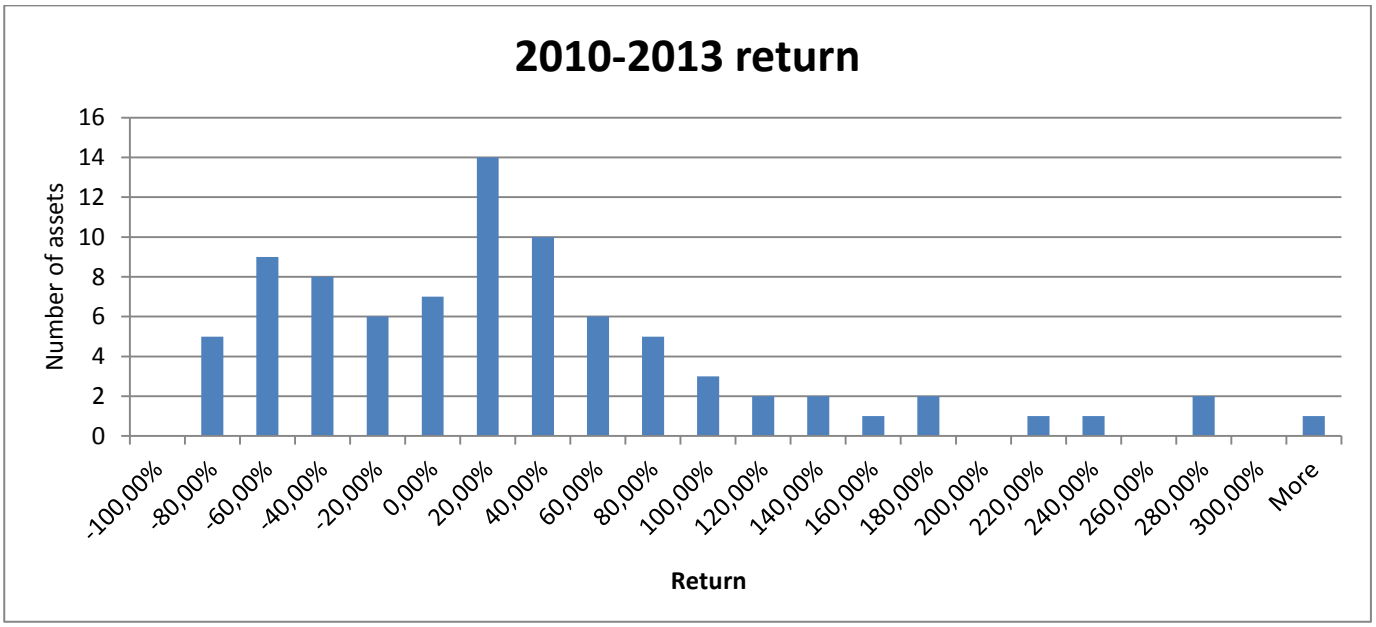
6.1.8.1 RJB applied to SRIF

Measures of variance and distribution are crucial when conducting an assets analysis. Larger variance means more risk, which investors, ceteris paribus, tries to avoid. In relation to return distribution, it is not something investors generally consider. However a standard normal distribution suggests less uncertainty, which could be beneficial. But when conducting the Robust Jarque-Bera Test on our 85 assets 5-year daily return, it is realized that 82 can reject the null hypothesis of a standard normal distribution. This correlates greatly with post-modern portfolio theory and Malkiel's famous hypothesis stating that the stock market follows a random walk (Malkiel, 1973).

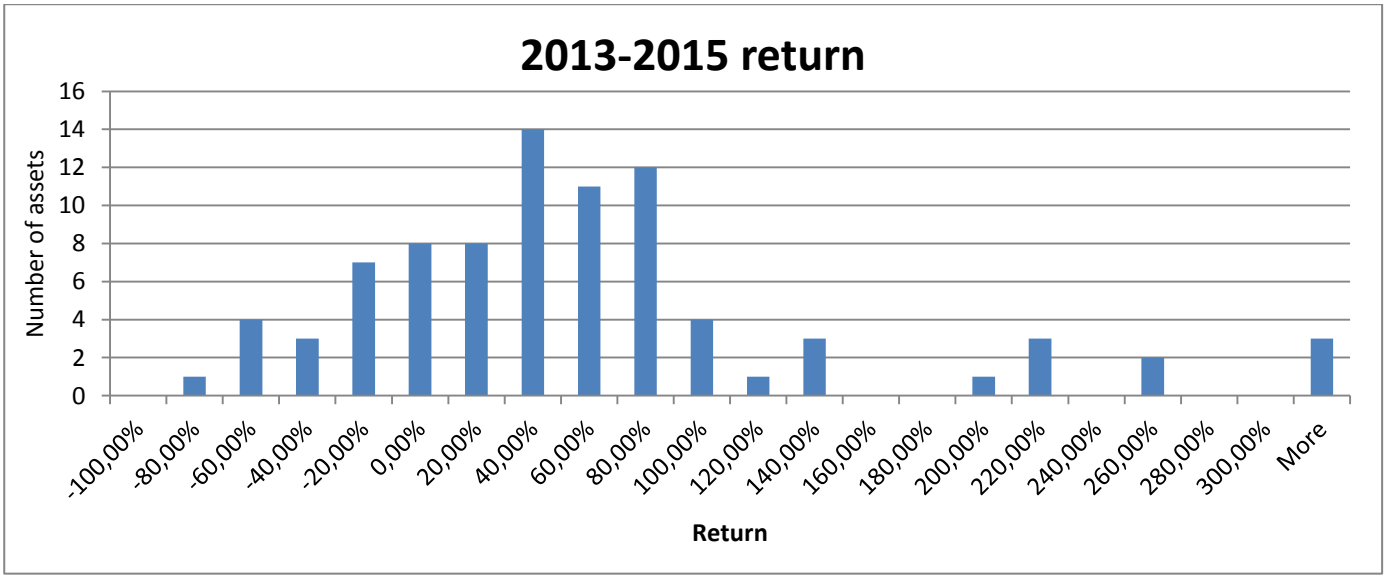
A histogram representation of the stock return for our stock universe in the periods May 2010 to May 2013 and May 2013 and May 2015, two periods we will explain the reason for in section 7.0, is shown in Graph 3 and Graph 4.

It further proves that returns are not normally distributed, even in clusters. The RBJ test also rejects the null hypothesis of normal distribution for both distributions.

Graph 3 – Return Histogram



Graph 4 – Return Histogram



6.2 Mutual fund rating and predictive power

More and more themed mutual funds are currently seeing the dawn of day. Danske Invest for example operates a biotechnology and a technology fund (Danske Invest, 2015) and several institutes are running portfolios focused on the climate and the environment (Nordea Invest, 2015).

This shows that there is a significant demand for mutual funds not solely focused on following the market, which boasts well for our aim of making SRIF relevant. There is however indication that especially the Danish Socially Responsible Investment funds are performing poorly compared to their benchmarks (Jørgensen, 2007), which is also shown in the small amount of capital invested in these funds compared to the total amount invested in mutual funds. This proves that the main aim for the typical investor is still profitability, putting considerations such as sustainability and ethics into the background. However, there could be a demand for a themed fund with competitive performance, and especially with a theme which interests a broad spectrum of potential investors.

With all these new mutual funds seeing the light of day, it has become a bit of a jungle to navigate through the enormous amount of possibilities. This has created a need for a rating system, which to a great extent has been covered by Morningstar. Their rating system of giving a mutual fund between 1 and 5 stars is however not always a good predictor of future performance. According to Morey (2003) the rating system cannot generally predict superior fund performance, but it does have some predictive power when it comes to below average performance. He argues that there is no significant difference between 3, 4 or 5-star rated funds in terms of future performance, but that funds with less than 3 stars generally have below average future performance, a point, as well as a more detailed description of the Morningstar rating system, we will come back to in section 7.0.

6.3 Portfolio Theory review

The following section will present a review and discussion of the most important concepts within portfolio theory. This subject is paramount for our portfolio choice since it will allow us to construct various portfolios cohesive with our chosen assets. The first section will be a review of Modern Portfolio Theory, henceforth referenced as MPT. Following that will be a look at Post Modern Portfolio Theory, henceforth referenced as PMPT. Related to PMPT is The Black-Litterman Model which will also be reviewed. The section will end with a short summary and with an explanation of how the theory will be applied to our portfolio creation.

6.4 Modern Portfolio theory

MPT as a concept was introduced in 1952 by Harry Markowitz and widely changed how investors perceived the interaction between risk and return (Elton & Gruber, 1997). The paper by Markowitz

implied that one could not simply look at the risk of each stock individually, but that the risk between all stocks in a portfolio would have an effect on each other (Elton & Gruber, 1997). Furthermore, the paper introduced the concept of mean-variance, which is the backbone of MPT introduced by Markowitz. In the following decades a vast amount of financial scholars, including Sharpe (1964), Tobin (1958) and Fama (1965), tried to add additional moments to MPT in order for the framework to be more intuitive and precise. In this section there will be a review of the main developments of MPT through the years, which will be vital in later parts of this thesis as our sport stock portfolios are constructed.

In this thesis it is argued that Harry Markowitz's two main contributions to MPT were the mean-variance theory and his Utility function. The mean-variance theory will be discussed in this section, but the Utility function will be discussed in the next section concerning PMPT as it is helpful in describing the difference between the two theoretical approaches.

6.4.1 Mean-Variance Theory

Markowitz (1952) introduced the concept of mean-variance to make certain generalizations about the market in order for his framework to be easily applicable to all portfolios. Over time there has been many arguments as to whether or not the assumptions made by Markowitz can actually be considered realistic in practice (Geambasu, et al., 2013), which will be discussed in section 6.5. Markowitz makes the argument that investors all have the same goal of achieving high returns to a low risk (variance). An investor is not interested in a portfolio that yields a high return if the consequent risk is disproportionally high in regards to all other existing portfolios. Calculating a portfolio's return and variance/standard deviation is the backbone of the mean-variance optimization and the formulas will therefore be depicted here:

Formula for calculating expected return for a portfolio (Bodie, et al., 2009):

$$E(r_p) = \sum_{i \ldots x=1}^{N} w_i E(r_i) .. + w_x E(r_x)$$

It can be observed that the expected return of a portfolio, is simply the expected return of stock *i* multiplied with the weight of stock *i* + the expected return of stock *x* multiplied with the weight of stock *x* and so on.

Formula for calculating portfolio variance and σ (Bodie, et al., 2009):

$$(var_p) = \sum_{j=1}^{n}\sum_{i=1}^{n} w_j w_i Cov(r_i, r_j)$$

$$\sigma = \sqrt{\sum_{j=1}^{n}\sum_{i=1}^{n} w_j w_i Cov(r_i, r_j)}$$

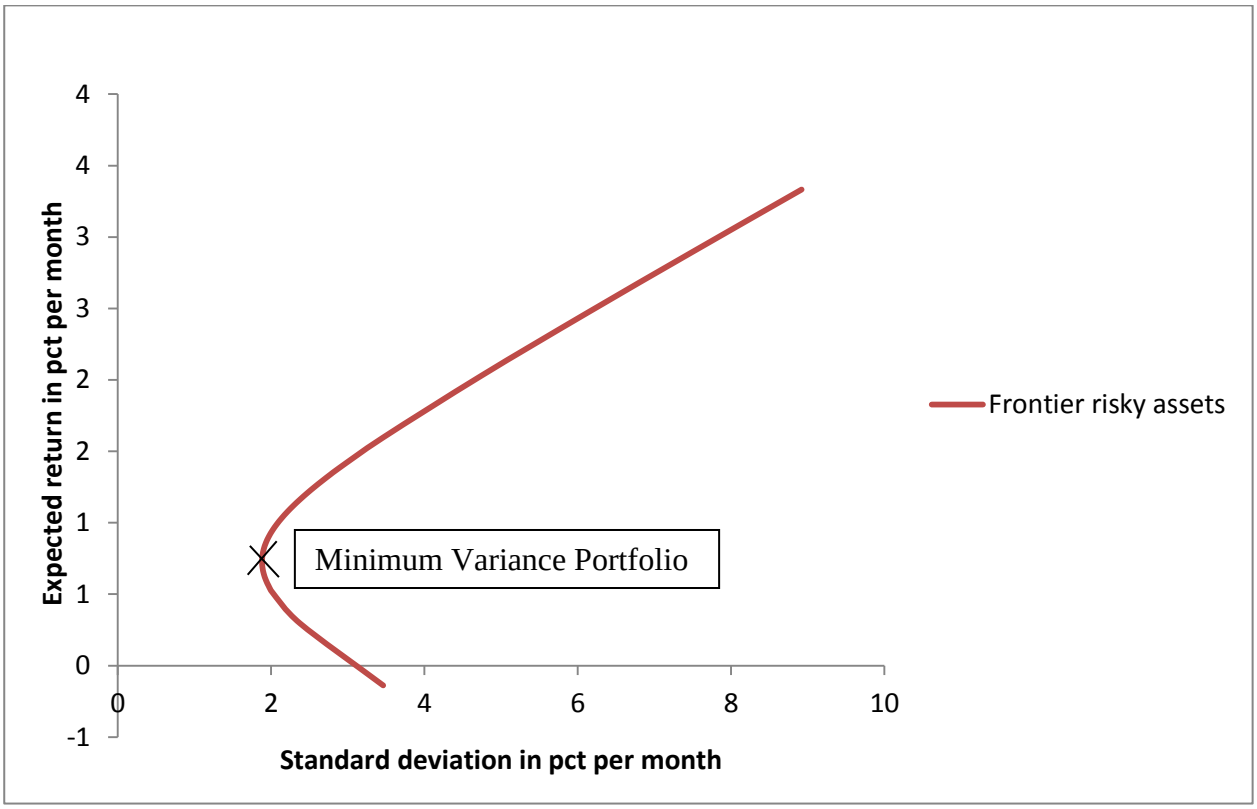
This above formula shows that the variance of a portfolio is found by multiplying the weight of each stock with the covariance of the stocks.

There is a set of risk-return portfolios that are universally preferred by investors because of their superior risk-return ratio. These portfolios are located on an efficient frontier (Geambasu, et al., 2013), which will be explained and visualized shortly. Another notable assumption by Markowitz is that investors are risk averse and that their risk aversion will increase as their fortunes increase (Markowitz, 1959). The final assumption used in mean-variance theory is normal distribution. Markowitz makes the, bold, assumption that stock returns will be normally distributed which is probably the most controversial part of the mean-variance theory. Historical returns rarely falls within a normal distribution and moments such as skewness and kurtosis have been added to the theory over the years (Elton & Gruber, 1997). The subjects of normal distribution, skewness and kurtosis for our stocks have been addressed earlier and thus will not be discussed again.

6.4.1.1 Efficient frontier

An efficient investor can hold any variation of stocks in his portfolio depending on his risk aversion as long as the portfolio is on the efficient frontier. Of course in practice it is possible, and not uncommon, to hold portfolios that are not on the efficient frontier, but in theory every investor would want to hold an optimal portfolio. All possible portfolios, optimal or not, are said to be feasible portfolios (Gitman & Joehnk, 2003), but only the portfolios with the optimal combination of risk and return are located on the efficient frontier. Markowitz further concludes that the minimum variance portfolio indicates the absolute minimum for an efficient portfolio, implying that only the minimum variance portfolio and the subsequently portfolios above this minimum can be located on the efficient frontier which can be seen in Graph 5.

Graph 5 - Efficient Frontier



The X shows the location of the minimum variance portfolio. Furthermore, Graph 5 can help in explaining the aforementioned feasible portfolios. To the right and below of the frontier is where all the feasible portfolios are located. These portfolios can be created but they would produce lower return compared to risk than the portfolios on the frontier. To the left and above of the frontier are no feasible portfolios, since these would have a higher return compared to risk than what is observed in the market (Gitman & Joehnk, 2003).

6.4.2 The risk-free rate

Present in theory and common in practice is the risk-free asset (Elton & Gruber, 1997). A completely risk-free asset can only exist in theory though, since every asset has a certain amount of risk to it, no matter how minute it may be. Nevertheless, long term bonds for countries such as, Sweden, Denmark or Germany are considered safe enough to be labeled as risk-free assets.

There are a few assumptions that must be made about the risk-free rate (Hirt & Block, 2006). First of all, it is assumed that there is an unlimited supply of the risk-free asset and thus no limit on the amount of the portfolio that consist of the asset. Secondly, since the return is risk free it is quite obvious that the standard deviation of the asset equals 0. Something that may not be quite as obvious is the fact that the co-variance of the risk-free asset and any risky asset in the portfolio is also 0.

6.5 Post-modern investment theory

As is often the result of the "modern" theories developed within the field of science, art or economics, a post-modern branch emerges. This is also the case within portfolio theory as the late 1970's saw an increased focus on investors as individuals with differing behavior unlike in MPT. The focus of investors in Post-Modern Portfolio Theory (PMPT) is still to find the optimal trade-off between risk and return, but the approach on how to describe and measure risk is significantly different (Geambasu, et al., 2013).

As with MPT, an overall description of PMPT will start this section in order to give the reader an easy overview of the subject. Afterwards, there will be a more in depth look at some of the main topics and instruments within PMPT that allows for a more comprehensive understanding of how the theories can be applied.

6.5.1 The Prospect Theory

The Prospect Theory (Kahneman & Tversky, 1979) gave a new perspective on investors. Markowitz (Markowitz, 1959) had argued that all investors are completely rational and will only invest based on information concerning the optimal risk/return trade-off in a portfolio. This changed with Prospect Theory which introduced a more behavioral and emotional side to the investor. This dramatically changes the allocation of an investor's portfolio since it is now dependent on his own assumption of what is risky (Kahneman & Tversky, 1979). Each investor will have a unique reaction to a loss, but also to a return higher than expected, the latter being a very important distinction from MPT. In the traditional MPT an investor does not like risk, or rather; he does not like a deviation from the expected return. But what if the actual return is higher than what was expected? In MPT this would still be considered a deviation and, by definition, a risk which would

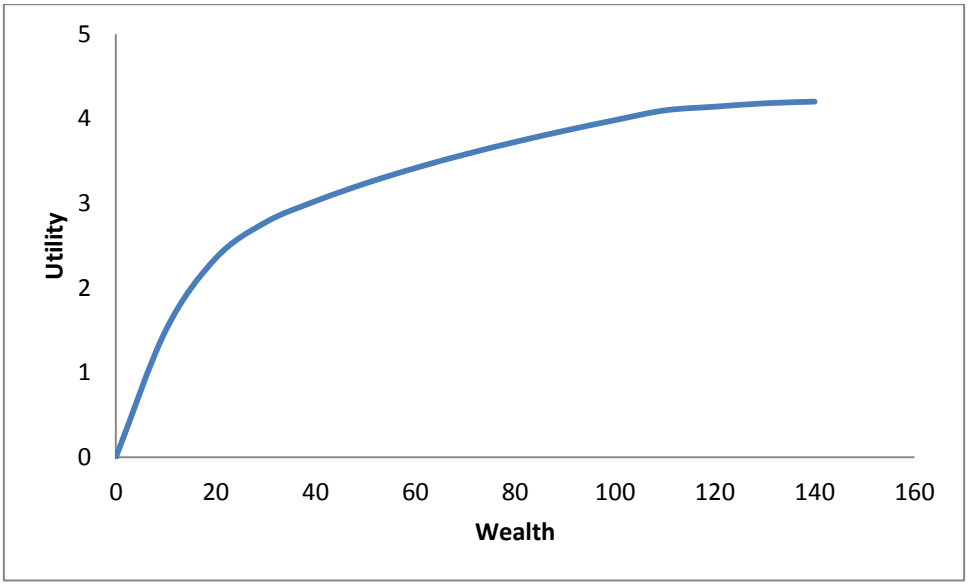
mean the standard deviation of the portfolio would increase causing the portfolio to be less desirable. This seems counterintuitive as a return that exceeds the expected in most situations would be positively welcomed by investors. In PMPT above expected returns are dealt with differently (Geambasu, et al., 2013). In PMPT the investor is described as someone who reflects negatively on losses, but not on returns that exceed the minimum expected return (Geambasu, et al., 2013). The actual risk in PMPT is the returns that are situated below a certain threshold, which is referred to as the Minimum Average Return (MAR).

The MAR of an investor is based on his utility function which will be the next topic to be looked upon.

6.5.2 The Utility Function in MPT and PMPT

The Utility Function is a result of MPT, more specifically introduced by Markowitz (1959), is a function that explains the risk profile of an investor. More precisely, it explains the interaction between utility (the investor's risk profile) and the wealth of the investor (Geambasu, et al., 2013). Markowitz argues that investors are per se risk-averse. What is meant by this statement is that as wealth increases, utility will increase but at a decreasing rate. A wealth increase of $10,000 would increase the utility of an investor, but with less than a wealth decrease of $10,000 would decrease the utility. This implies that investors would not accept a risky project unless they are offered a risk-premium and they are therefore considered to be risk-averse, which is shown on Graph 6.

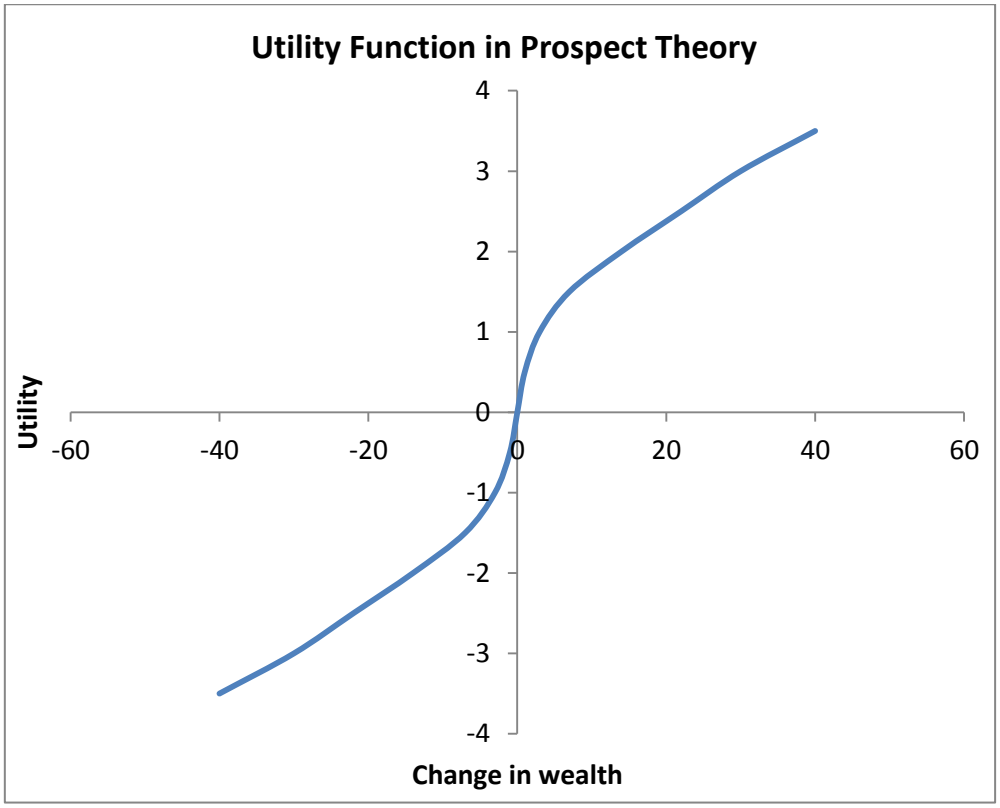
Graph 6 – Conventional utility function



It is clear from Graph 6 that the Utility function is concave, meaning that extra wealth is less appreciated than an identical loss. This is the point that MPT stresses; as the wealth of the investor increases so will the risk-aversion of said investor.

The utility function in PMPT, more precisely in Prospect Theory, looks vastly different. In PMPT risk-aversion is replaced with loss-aversion (Bodie, et al., 2011), which provides another approach on how to think of utility. It is argued that utility is not a matter of how much wealth the investor has, as is the case with MPT, but rather how much the wealth changes from its current level (Bodie, et al., 2011). A visual representation can be seen in Graph 7.

Graph 7 - Utility Function in Prospect Theory



Graph 7 shows how the utility function looks in Prospect theory and the difference from the conventional utility function is quite clear. Notice that 0 does not indicate zero wealth, but zero change in current wealth. To the left of 0 the function is not concave as in MPT but convex. This

convexity implicates how an investor will behave. A convex function implies that the investor is willing to take risks when it comes to losses. In other words, the investor is more willing to take on risky projects to prevent a negative change in his wealth.
This is the distinct difference between MPT and PMPT when it comes to an investor's utility. In MPT the investor is averse towards risk whereas the investor in PMPT is averse towards negative change in his wealth.

Introduced in the section before was MAR and this is the method for how investors in PMPT set a minimum of accepted return. MAR is also used in order to calculate the risk of these portfolios. This is done by calculating Downside Risk, which will be the focus in the following section.

6.5.3 Downside Risk

The subject that divides MPT and PMPT the most is that of risk measurement (Geambasu, et al., 2013). Modern portfolio theory relies on standard deviation as the main source of determining risk, which means that every deviation from the average return is considered risky. This seemed problematic for scholars of PMPT as returns that are above the average also were negatively perceived by investors; a case that seems highly unlike in practice (Geambasu, et al., 2013). Therefore, the concept of downside risk was introduced. The purpose of Downside risk is to explain how much of the variance that is actually caused by negative returns, meaning how much of the deviation from the average is below the average. An important distinction about downside risk is that it is compared to the MAR that was introduced in the section above. MAR differs from each investor depending on his risk aversion or utility function and thus the downside risk of each investor is different. When referring to downside risk the term semivariance is often the most used (Washer & Johnson, 2013). Semivariance shows the amount of the overall risk in percentage that is a result of below MAR returns and has the formula (Washer & Johnson, 2013):

$$\text{Semivariance} \;=\; \text{VARsemi} = \sum_{1}^{n} \frac{(r_t - \bar{r})^{\,2}}{n-1}$$

Where r_t is the negative return in time t, $\bar{r}$ is the MAR and n is the number of observations.

The formula for finding semivariance is similar to the variance formula, with the distinction that all returns above MAR is given a value of zero, which results in only the negative variance being

captured. If the semivariance is above 50% this implies that more than half the variance is caused by negative returns. If this is the case the stock is overpriced because the downside risk is greater than what the variance shows.

The most intuitive approach to explain the difference between variance and semivariance is by using the two-bet example as can be seen in Table 4:

Table 4 – The two bet example

	Bet 1: **You can win $4 with 90% probability, or lose $36 with 10% probability.**	**Bet 2:** **You can win $12 with 50% probability, or lose $12 with 50% probability.**
Expected Return	$4*0.9 – $36*0.1 = 0	$12*0.5 – $12*0.5 = 0
Variance	$(4-0)^2 *0.9 + (-36-0)^2*0.1 = 144$	$(12-0)^2 *0.5 + (-12-0)^2 *0.5 = 144$
Semivariance	$(-36-0)^2 *0.1 = 129.6$	$(-12-0)^2 *0.5 = 72$

When observing the two bets they appear to be equally attractive for the investor since both expected return and variance are identical. But if semivariance is taken into account this indifference changes. Remember that semivariance explains all returns that occur below the MAR, in this case, the expected return of 0. When observing the difference in semivariance it becomes clear that even though the variance of the two bets are identical, bet 2 offers significantly less downside risk. In fact, if bet 2 was a stock, the variance would be a perfect risk measure, since 50% of the deviation from the expected return is negative and 50% is positive. But if bet 1 was a stock, the variance would not be an appropriate risk measure since 90% (129.6/144) of the risk is downsided. From a traditional mean-variance point of view the two stocks (bets) should cost the same as the risk/return ratio is identical. But if downside risk is included it becomes clear that stock 1 is vastly overpriced compared to stock 2, since the majority of stock 1's risk is downsided.

Semivariance to variance ratios will be applied to analyze the downside risk of the portfolios which have been selected using MPT and PMPT/Black-Litterman (see section 7.5).

The Sortino ratio

As the relationship between conventional variance and return is of importance, so is the one between semivariance and return. This is done by using the Sortino ratio (Washer & Johnson, 2013). The Sortino ratio is very much similar to the Sharpe ratio but instead of using standard deviation, semidevation is used. Semideviation is calculated using semivariance exactly as one would calculate standard deviation from variance – meaning that the semideviation is semivariance squared. The Sortino ratio looks like this (Washer & Johnson, 2013):

$$SR = \frac{\bar{r} - r_t}{D_{semi}}$$

The main difference between the two ratios is that the Sortino ratio is able to show the relation between negative risk and return, whereas the Sharpe ratio only shows the relation between overall risk and return. Therefore, the two ratios are often used together in order to gain a more nuanced picture of the risk/return ratio of a portfolio. If a portfolio has a high Sharpe ratio, but a very low Sortino ratio, it suggests that although the portfolio has a high return compared to risk, a lot of the risk is downsided. If the opposite scenario occurs, same Sharpe ratio but a higher Sortino ratio, then the portfolio is considered less risky since more of the risk is attributed positive deviations from the average return. Thus, the Sortino ratio can help in finding the preferable portfolio between portfolios with similar Sharpe ratios.

6.5 Black-Litterman

The Black-Litterman asset allocation model, created by Fischer Black and Robert Litterman (1992), is a portfolio construction model. The issue they tried to solve was the unrealistic portfolios computer systems often created when using mean-variance asset allocation without restrictions (Idzorek, 2005). The problem was that the mean-variance optimization method often had extreme long and short positions in stocks that were not attainable in real life (Idzorek, 2005). Furthermore, there was a demand for investors to incorporate their own views into their asset allocation, and not strictly base it on past returns/risk. These issues were solved through the Black-Litterman model that introduced Reverse Optimization and Investor views (Black & Litterman, 1992), which both will be described.

6.5.1 Reverse Optimization

The Black-Litterman model uses "equilibrium" returns as their starting point. Equilibrium returns are the set of returns that explain the current weight of each stock in the market (Idzorek, 2005). In other words, instead of using expected returns to find the appropriate weights of each stock, they reverse the procedure by assuming that the current market weights can be used to find the implied excess equilibrium returns (Black & Litterman, 1992). The implied equilibrium returns are derived using a reverse optimization method in which the vector of implied excess equilibrium returns is extracted using this formula (Idzorek, 2005):

$$\Pi = \lambda \sum w_{mkt}$$

Where Π is the vector of Implied Excess Returns, λ is the coefficient of Risk aversion, Σ is the covariance vector of the excess returns and w_{mkt} is the vector with the market capitalization weight of the assets.

The risk-aversion coefficient (λ) characterizes the expected risk-return tradeoff. It is the rate at which an investor will give up expected return for less variance. It is found by using the following formula:

$$\lambda = \frac{Average\ Excess\ Return}{2 * Average\ Variance\ of\ returns}$$

Before introducing Investor views, it is more intuitive to observe the entire Black-Litterman model first (Idzorek, 2005):

$$E[R] = [(\tau\Sigma)^{-1} + P'\Omega^{-1}P\ ]^{-1}[(\tau\Sigma)^{-1}\Pi + P'\Omega^{-1}Q]$$

E[R] is the new combined vector returns which are used when allocating the assets. τ is just a scalar, typically 1 since it is the easiest when calculating. Σ is still the covariance vector. Π was found earlier and is the vector of implied excess returns.
P, Ω and Q are all related to the investor views. *P* is a matrix that describes which assets that are part of the view. Ω is a diagonal matrix of the error terms which describe the uncertainty of each view. Q is the actual views.

6.5.2 Investor Views

In practice investment managers have specific views regarding the expected return of some of the assets in a portfolio, which differ from the Implied Equilibrium return. The Black-Litterman model allows such views to be expressed in either absolute or relative terms. Below are three sample views directly taken from Thomas Idzorek's (2005) explanatory paper of the Black-Litterman model:

- *View 1: International Developed Equity will have an absolute excess return of 5.25% (Confidence of View = 25%).*
- *View 2: International Bonds will outperform US Bonds by 25 basis points (Confidence of View = 50%).*
- *View 3: US Large Growth and US Small Growth will outperform US Large Value and US Small Value by 2% (Confidence of View = 65%).*

(Idzorek, 2005, page 7)

View 1 is an example of an absolute view, where the investor only estimates the outcome for a single equity compared to the market. Views 2 and 3 are relative views where outcomes between different equities are predicted. Relative views are more commonly used by practitioners than absolute views (Idzorek, 2005). View 2 says that the return of International Bonds will be 0.25% greater than the return of US Bonds and the 50% confidence level is a way of controlling Q, so that the investor can make the prediction but with a limited weight on the implied excess returns due to the 50% uncertainty.

By combining the reverse optimization and investor views the Black-Litterman model is able to calculate expected returns and from there can be used as an asset allocation model. It is important to note that the Black-Litterman model can be used without investor views. The values related to the views (P, Ω and Q) will all be 0, and thus not influence the model. Black-Litterman will be added to our methods of portfolio construction in the following section 7.4.

6.6 Summary

Modern portfolio theory was introduced in 1952 and was the first to describe the trade-off between risk and return in a portfolio, in the form of mean-variance optimization. The efficient frontier shows the optimal portfolios that are available. MPT assumes that all investors behave the same

way, and that risk aversion increases with wealth explained through the traditional utility function. Post-Modern portfolio theory introduced the Prospect theory which states that investors are more complex and behave individually. Furthermore, the Prospect theory introduced a Utility function where investors are risks takers in order to avoid a loss in wealth. PMPT also deals with the concept of downside risk. Downside risk and semivariance is used to show how much of a portfolio's variance that is derived from negative returns. Finally, the Black-Litterman model from 1992 created a new way to find expected returns through a combination of reverse optimization and investor views.

From MPT mean-variance optimization will be used in order to create portfolios that have been allocated in regards to minimizing-variance, maximizing return and maximizing Sharpe ratio. The Black-Litterman model has also been used to create portfolios with and without investor views. Downside risk has been used to evaluate the return/variance ratios of all the created portfolios. A more thorough explanation of each created portfolio is found in sections 7.2-7.4.

7.0 Asset Allocation

7.0.1 Methodology

In order to determine the best asset allocation model, a variety will be tried out and analyzed through this section. From a simple equal-weighted portfolio of the investment universe to the more complex Black-Litterman theory, will be examined to get the most nuanced picture of the possible performance of SRIF. All portfolios are limited, due to the coherence from current Danish legislation and especially the well-known 5-10-40 rule. We will take the standpoint of a rational investor, meaning that, ceteris paribus, a higher Sharpe ratio is preferable to a lower one and will therefore increase the investor's overall utility.

The ten portfolios are constructed and evaluated based on daily price data, in DKK, retrieved from Datastream, in the period between the 1st of May 2010 and the 1st of May 2015. All data and relevant calculations can be found on the attached CD-ROM. We have retrieved the data in DKK because comparisons with Danish benchmarks therefore are assumed to be more valid (Elton, et al., 2011). We acknowledge that exchange rate fluctuations will distort some of the returns, but it is assumed that these distortions will more or less offset. Furthermore it is outside the scope of this thesis to calculate the exchange rate risk and possible ways of hedging against it.

The first three years of data is named the Data Period (10-13) and the next two years the Holding Period (13-15). The simple portfolios (equal- and market-weighted) have been constructed using total equity value as of May 2013 (the beginning of the Holding Period). The more complex asset allocation models have been created with the aid from calculated correlation and covariance matrixes, together with calculations of implied excess return, expected excess return etc. These calculations are based on the Data Period to create optimal portfolios, on the basis of the, at the time, known information. All portfolios are valuated based on return, standard deviation and Sharpe ratios, the latter the most important. A feature that we need to stress is that returns are reported on a yearly basis whereas standard deviation is calculated based on daily returns. This gives Sharpe ratios, which in absolute terms are extremely high, and as such should be taken lightly. Both benchmarks and portfolios have however followed this approach and the grounds for comparison should therefore be valid. The complex portfolio allocations have been optimized through the use of the solver function in Microsoft Excel.

An alteration in regards to the Sharpe ratio rate has however been made, as the risk-free rate is not included because of its insignificance the last 5 years (French, 2015). In the same manner it is

important to mention that none of the benchmark funds, or the fictive portfolios, did subtract any administration costs. Nor have any tax regulations been taken into consideration, as the aim of this thesis is to assess whether creating a SRIF is a competitive idea. It is not to evaluate different banks administration costs contra the expected one from SRIF, and furthermore not to analyze individual tax brackets and exemptions.
Finally, a risk assessment through beta analyses and downside risk has been applied to individual stocks and some of the portfolios and benchmarks in order to make a more thorough comparison.

7.1 Benchmarks

7.1.1 The Morningstar Rating

Investment funds are not mainly evaluated on their absolute performance, but almost exclusively on their relative performance in relation to other funds or indexes. To see how significant this comparison is, one needs to look no further than the importance of the Morningstar rating in modern business. The Morningstar rating system has a fixed distribution of stars; the top 10% of funds within each category receive 5 stars, the next 22.5% receive 4 stars, then 35% receive 3 stars, 22.5% receive 2 stars, and the bottom 10% receive 1 star. These stars are given based on historical performance relative to risk and costs to the investor (Blindkilde, 2003). The Morningstar category segmentation is plentiful and in the United States there are 110 categories divided into 9 groups, which adds to extensiveness of this classification system (Morningstar, 2014). It secures a relevant comparison of funds and is supposedly a significant reason for its popularity as an evaluative tool.

Blake & Morey (2000) put forward that 97% of money flowing into equity funds are of four- or five-star rating, whereas funds with a lower than three-star rating have a net outflow of capital, in their assessment of study published in both the Boston Globe and The Wall Street Journal. This finding is both illogical and logical based on empirical findings, since data shows that funds receiving their first five–star rating will have a sharp and significant drop in performance (Morey, 2003). Morey (2003) furthermore explains this by the inability to load on momentum stocks and the alteration of portfolios post five-star rating. On the other hand, his analysis also shows a statistically significant below average future performance from one- and two-star rated funds. This indicates that the rational investor should put his capital into three-star or higher rated funds, but not expect future five-star performance if investing in five-star rated funds.

7.1.2 The six benchmark funds

The six benchmarks are all fundamentally different, and are chosen due to the market's lack of sport-relations investment funds, meaning that there is no natural Morningstar category where SRIF would fit. Therefore, a broad range of stock-based funds have been selected to give a general assessment of the performance. The six funds are all four- or five-star rated which should give a good indication of above average performance if SRIF is relatively competitive. Three of the funds are themed in some way, similar to SRIF. The other three are broader indexes with focus on respectively, the Danish, the European and the global stock market. The return and standard deviation calculations are all based on daily data from Euroinvestor.dk dating from 1st of May 2010 to 1st of May 2015, exactly like the fictive SRIF portfolios. At the same time, all six funds are risk evaluated based on a 1-7 scale from their providers and range between 5 and 6, which suggest that they more or less are within the same risk category.

7.1.2.1 Danske Invest Bioteknologi

Has focus on American biotechnology stocks, and has around 20-30 stocks in the portfolio (Danske Invest, 2015). Danske Invest evaluates it to have a risk of 6 based on a 1-7 scale and Morningstar has given it 4 stars. In the Data Period (10-13) it had a p.a. return of 13.28% and standard deviation of 1.51%. The Holding Period (13-15) produced a p.a. return of 31.08% and standard deviation of 1.89% equaling a Sharpe ratio of 16.42.

7.1.2.2 Danske Invest KlimaTrends

Has focus on companies which are believed to benefit from the development in the climate and environment industry, and has around 50-80 stocks in the portfolio (Danske Invest, 2015). Danske Invest evaluates it to have a risk of 6 based on the 1-7 scale and Morningstar has given it 4 stars. In the Data Period (10-13) it had a p.a. return of -2.37% and standard deviation of 1.17%. The Holding Period (13-15) produced a p.a. return of 11.27% and standard deviation of 1.05% equaling a Sharpe ratio of 10.75.

7.1.2.3 Danske Invest Teknologi

Has focus on companies which are believed to benefit from the development in the broad technology category, and typically has less than 125 stocks in the portfolio (Danske Invest, 2015). Danske Invest evaluates it to have a risk of 6 based on a 1-7 scale and Morningstar has given it 5

stars. In the Data Period (10-13) it had a p.a. return of 7.84% and standard deviation of 1.28%. The Holding Period (13-15) produced a p.a. return of 35.36% and standard deviation of 1.15% amounting to a Sharpe ratio of 30.83.

7.1.2.4 Jyske Invest Favorit Aktier – Global

A fund trying to give a return based on the broader global stock indexes, which currently holds 110 assets in the portfolio (Jyske Invest, 2015). Jyske Invest evaluates it to have a risk of 5 based on a scale from 1-7 and Morningstar has given it a 5-star rating. In the Data Period (10-13) it had a p.a. return of 10.22% and standard deviation of 1.12%. The Holding Period (13-15) produced a p.a. return of 23.01% and standard deviation of 0.93% equaling a Sharpe ratio of 24.70.

7.1.2.5 Jyske Invest Europæiske Aktier

The fund tries to replicate the broader European stock indices while also including companies which have at least 50% of their operation in Europe. It currently holds 72 assets in the portfolio (Jyske Invest, 2015). Jyske Invest evaluates it to have a risk of 6 based on a scale from 1-7 and Morningstar has given it a 4-star rating. In the Data Period (10-13) it had a p.a. return of 8.44% and standard deviation of 1.34%. The Holding Period (13-15) produced a p.a. return of 20.92% and standard deviation of 0.98% giving a Sharpe ratio of 21.24.

7.1.2.6 Nordea Invest Danske Aktier Fokus

A fund with focus on the Danish stock market, and with OMX Copenhagen Cap Index as benchmark, which currently holds 33 assets in its portfolio (Nordea Invest, 2015). Nordea Invest has evaluated it to have a risk of 6 based on a scale from 1-7 and Morningstar has given it a 5-star rating. In the Data Period (10-13) it had a p.a. return of 10.99% and standard deviation of 1.23%. The Holding Period (13-15) produced a p.a. return of 23.46% and standard deviation of 1.34% equaling a Sharpe ratio of 17.52.

Table 5 – Benchmark funds

Name	Danske Invest Bioteknologi	Danske Invest KlimaTrends	Danske Invest Teknologi	Jyske Invest Favorit Aktier - Global	Jyske Invest Europæiske Aktier	Nordea Invest Danske Aktier Fokus
Morningstar rating	4	4	5	5	4	5
Return 10-15	150,93%	15,93%	131,23%	102,81%	85,80%	107,30%
Return p.a.	20,20%	3,00%	18,25%	15,19%	13,19%	15,70%
Standard Deviation	1,67%	1,12%	1,23%	1,05%	1,21%	1,28%
Sharpe Ratio	12,06	2,67	14,83	14,49	10,89	12,31
Return 10-13	45,37%	-6,95%	25,40%	33,90%	27,51%	36,73%
Return p.a.	13,28%	-2,37%	7,84%	10,22%	8,44%	10,99%
Standard Deviation	1,51%	1,17%	1,28%	1,12%	1,34%	1,23%
Sharpe Ratio	8,81	-2,02	6,11	9,13	6,29	8,94
Return 13-15	71,81%	23,80%	83,23%	51,31%	46,22%	52,42%
Return p.a.	31,08%	11,27%	35,36%	23,01%	20,92%	23,46%
Standard Deviation	1,89%	1,05%	1,15%	0,93%	0,98%	1,34%
Sharpe Ratio	16,42	10,75	30,83	24,70	21,24	17,52

7.1.3 Morningstar industry and sector average

The last benchmark we will highlight is the overall average for Morningstar recognized industries and sectors. From Morningstar's database 96 different industries and sectors, for which Morningstar analyzes performance, were identified and a yearly average return was calculated based on 5 years of data (Morningstar, 2014). It provided a result of 11.50% return p.a. which should be the minimum return threshold a competitive mutual fund should reach. However, if SRIF can be in the proximity of 5 of the benchmark funds (Danske Invest KlimaTrends excluded because of its poor return) there should be plenty of potential investors.

7.2 Simple Portfolios

In this section we have created four simple portfolios which, theoretically, should produce some positive results if our hypothesis of sport and sport-related stock as a good investment, is true. Two portfolios will be variants of the equal weighted approach where wealth is distributed equally among all the available assets in order to minimize the maximum allocation in any single asset. However, it does not take correlation and covariance between the stocks into consideration, making it a naive approach compared to other more mathematical complex approaches. The two other portfolios are variants of holding the market portfolio where the weight in each asset is determined

by its total equity value. This is an approach that assumes a perfect market, and as such that the individual investors should only choose between allocating in the risk free asset and the market portfolio. The equal-weighted portfolios have however generally outperformed the market-value-weighted portfolios in the US during the previous four decades on all major evaluation parameters (Plyakha, et al., 2012). Whether that will be the case for our portfolios is hard to foresee as our market universe is not extensive and thus does not reflect the broad spectrum of holding a more diversified market portfolio.

7.2.1 Portfolio 1 – Equal weighted

The first portfolio is equally weighted among the 85 assets in the investment universe. This weighting ignores both market cap and covariance among the asset classes, but has no difficulties in regards to coping with the Danish legislative framework due to the small concentrations in each stock. Every stock has a weight of 1.18%. This distribution of capital yields a p.a. return of 6.47% with a standard deviation of 1.32% in the Data Period (10-13), while the Holding Period (13-15) gives a p.a. return of 20.15% with a standard deviation of 0.67% equaling a Sharpe ratio of 30.00.

7.2.2 Portfolio 2 – Equal weighted – no sport clubs

Again this portfolio ignores market cap and covariance among the asset classes, but has no difficulties regarding the Danish legislative framework. The key differentiator compared to portfolio 1 is that sport clubs and their diluted focus on earnings are sorted out, which should provide greater earnings but might lose robustness due to market swings. Every stock has a weight of 1.56%. This distribution of capital yielded a p.a. return of 10.33% with a standard deviation of 0.96% in the Data Period (10-13), while the Holding Period (13-15) gave a p.a. return of 22.24% with a standard deviation of 0.74% equaling a Sharpe ratio of 30.19.

7.2.3 Portfolio 3 – Market weights

With the constraints from the Danish legislation, and especially the 5-10-40 rule, a market weighted portfolio is set up based on total equity value. Furthermore we have tightened the constraints so that the maximum weight of any asset is 5%. The assets with the biggest weights are CMCSA (5.0%),

NKE (5.0%), CBS (5.0%), SKY (5.0%), ADS (5.0%), YUEN (5.0%) and PUM (5.0%). The Data Period (10-13) yielded a p.a. return of 10.51% with a standard deviation of 1.00%, while the Holding Period (13-15) gave a p.a. return of 25.30% with a standard deviation of 0.74% equaling a Sharpe ratio of 34.35.

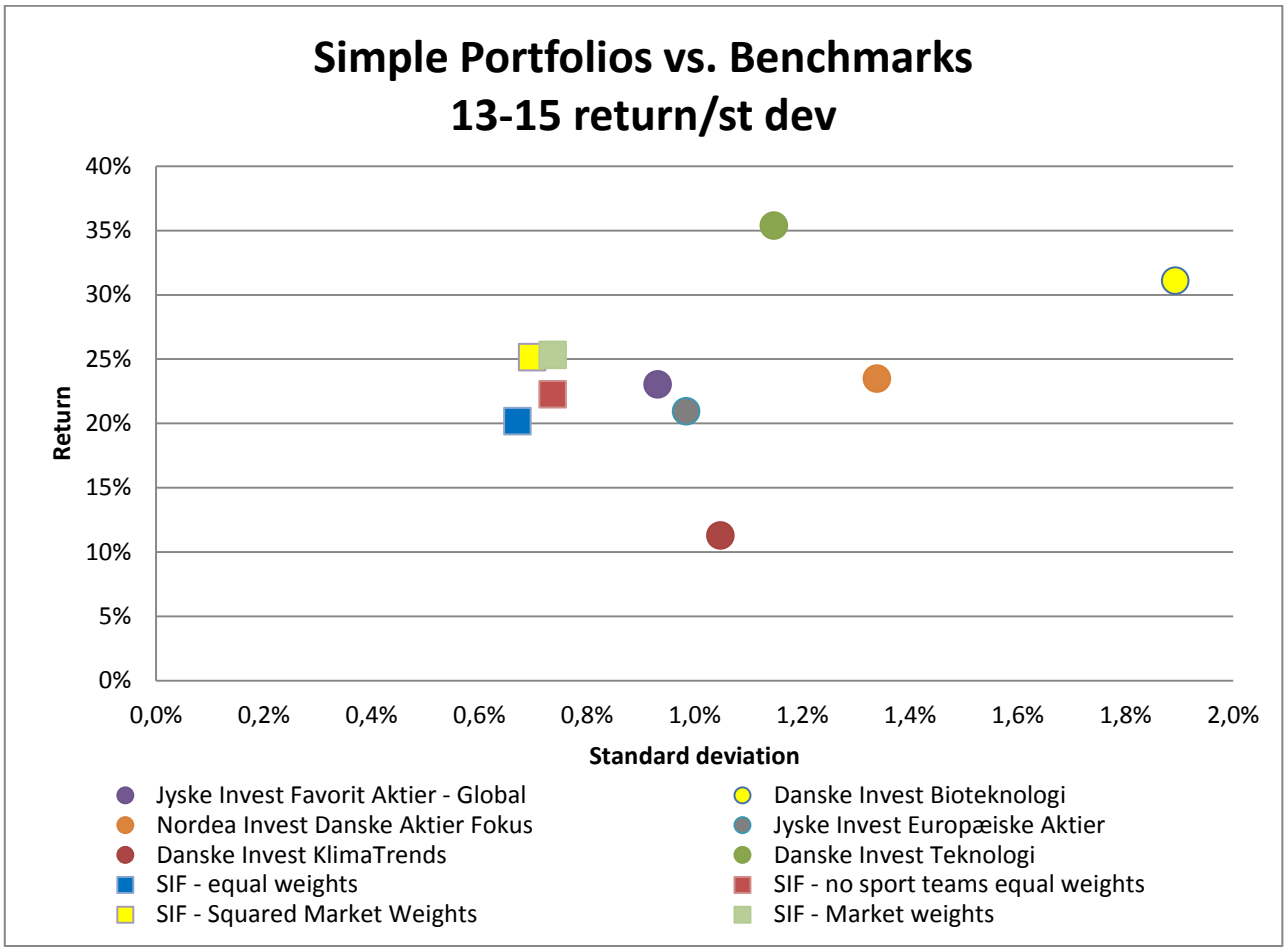
7.2.4 Portfolio 4 – Squared market weights

The total equity value for all companies are squared to get a more equal distribution of the asset allocation, but at the same time keep the same relative weights. Furthermore, it helps to uphold the Danish legislative framework. The biggest companies are naturally the same as in Portfolio 3, but the weight percentages are of course different; CMCSA (8.2%), NKE (7.0%), CBS (4.1%), SKY (5.1%) and ADS (4.4%). The Data Period (10-13) again yielded a p.a. return of 12.01% with a standard deviation of 0.97%, while the Holding Period (13-15) gave a p.a. return of 25.13% with a standard deviation of 0.70% amounting to Sharpe ratio of 35.96.

Table 6 – Simple Portfolios

Name	SIF - equal weights	SIF - no sport teams equal weights	SIF - Market weights	SIF - Squared Market Weights
Return 10-15	74,24%	100,68%	111,89%	120,03%
Return p.a.	11,75%	14,95%	16,20%	17,08%
Standard Deviation	1,32%	0,88%	0,90%	0,87%
Sharpe Ratio	8,92	17,01	17,97	19,59
Return 10-13	20,70%	34,31%	34,96%	40,53%
Return 10-13 p.a.	6,47%	10,33%	10,51%	12,01%
Standard Deviation	1,61%	0,96%	1,00%	0,97%
Sharpe Ratio	4,02	10,74	10,55	12,37
Return 13-15	44,36%	49,42%	57,00%	56,57%
Return 13-15 p.a.	20,15%	22,24%	25,30%	25,13%
Standard Deviation	0,67%	0,74%	0,74%	0,70%
Sharpe Ratio	30,00	30,19	34,35	35,96

Graph 8 - Simple portfolios vs. Benchmarks



As seen in both Table 6 and Graph 8 the simple portfolios are fully competitive with our benchmark funds, with the market weight portfolios performing a bit better than the equal weighted ones. All four SRIF portfolios have Sharpe ratios higher or almost equal to the best benchmark fund (Danske Invest Teknologi)

7.3 Mean-variance

Here we will present results from 3 different portfolios created using mean-variance optimization as an asset allocation tool. The three approaches we have taken are; a minimum variance portfolio, a maximum return portfolio and maximum Sharpe ratio portfolio, all based on historical data from May 2010 to May 2013 which should prevent data mining for the Holding period. A rather tenuous

assumption taken in these calculations is that previous return equals future expected return. Therefore, our Data Period (10-13) will provide extremely beneficial results, but as they are created based on hindsight, they should not be given any weight.
Based on the slight difference between the two equally weighted portfolios in terms of risk and return, it was deemed irrelevant to this thesis to create more portfolios without the inclusion of sport clubs.

7.3.1 Portfolio 5 – Minimum-Variance

The overall aim is to minimize future expected variance. The portfolio restrictions from the Danish legislative framework have been further tightened, as we have chosen to have a maximum weight of 5% in each stock.
The weights of the biggest companies of the portfolio are as such: CCP (5.0%), CSPT (5.0%), SRIS (5.0%), SWD (5.0%) and AFC (4.7%). The Data period yielded a 6.39% return p.a. with a standard deviation low at 0.48%. The Holding period however gave a p.a. return of 15.55% with a standard deviation of 0.47% equaling a Sharpe ratio 32.83.

7.3.2 Portfolio 6 – Maximize Return

The overall aim is to maximize future expected return. The portfolio has the same restrictions as Portfolio 5.
The weights of the biggest companies of the portfolio are rather extreme as 20 companies have all been assigned the maximum weight of 5.0%. The 20 companies are; BVB, BIF, CPHC. CBS, ESS, FL, HEAD, LULU, PAP, SIF, SSL, SPO, SCB, SCG, SPD, SPBV, CLUB, UA, WEB and WMH. The Data period yielded a 27.98% p.a. return with a standard deviation 6.08%. The Holding period gave a return of 16.37% with a standard deviation of 1.33% equaling a Sharpe ratio 12.35 which is by far the lowest of all portfolios.

7.3.3 Portfolio 7 – Maximize Sharpe ratio

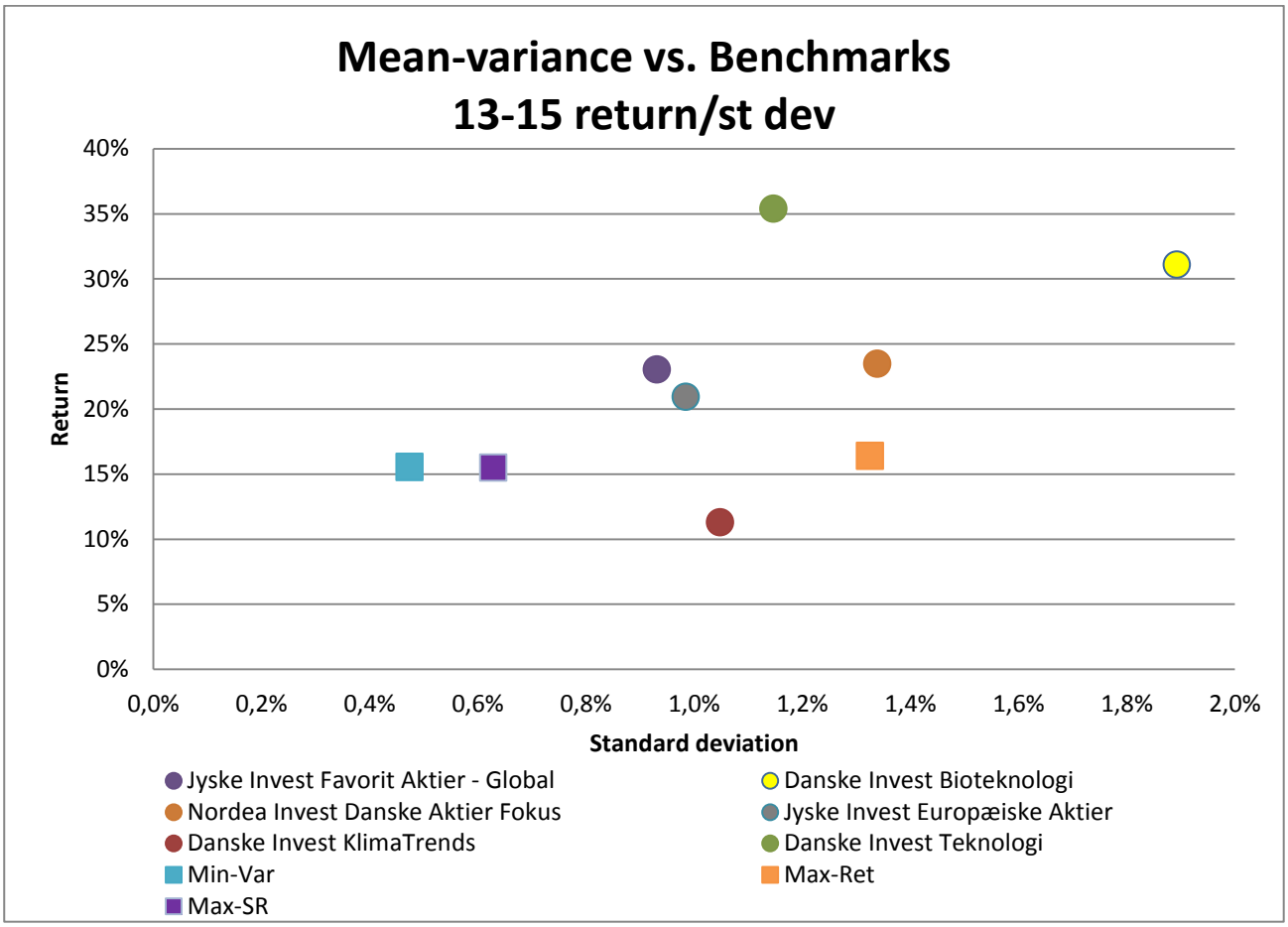
The overall aim is to maximize the expected Sharpe ratio. The portfolio has the same restriction as the two previous portfolios.

The biggest weights of the portfolio are as such: BVB (5.0%), CCP (5.0%), CSPT (5.0%), CMCSA (5.0%), SRIS (5.0%), HEAD (5.0%), H9W (5.0%), PAP (5.0%), SPO (5.0%), SPD (5.0%) and WMH (5.0%). The Data period yielded a 27.11% p.a. return with a standard deviation of 0.77%. The Holding period gave a p.a. return of 15.48% with a standard deviation of 0.63% equaling a Sharpe ratio of 24.61 which is lower than the Sharpe ratio produced by the Minimum-variance portfolio.

Table 7 – Mean-Variance portfolios

Name	Min-Var	Max-Ret	Max-SR
Return 10-15	60,82%	183,86%	173,85%
Return p.a.	9,97%	23,20%	22,32%
Standard Deviation	0,48%	4,78%	0,72%
Sharpe Ratio	20,97	4,85	31,12
Return 10-13	20,44%	109,62%	105,37%
Return 10-13 p.a.	6,39%	27,98%	27,11%
Standard Deviation	0,48%	6,08%	0,77%
Sharpe Ratio	13,45	4,61	35,26
Return 13-15	33,53%	35,42%	33,35%
Return 13-15 p.a.	15,55%	16,37%	15,48%
Standard Deviation	0,47%	1,33%	0,63%
Sharpe Ratio	32,83	12,35	24,61

Graph 9 – Mean-Variance Portfolios vs. Benchmarks



None of the three portfolios performs better than any of the four simple ones in the previous section. However, both the Min-Var and Max-SR seems to be competitive anyway compared to the benchmark funds, when looking at Graph 9 – Mean-Variance Portfolios vs. Benchmarks. Especially the Min-Var portfolio is performing well as it has a higher Sharpe ratio than any of the Benchmark funds in the Holding period. The Max-Ret portfolio is not worth any consideration.

7.4 Black-Litterman portfolios

The Black-Litterman model is as explained previously created based on reverse optimization, and the fact that investor opinions should not change the weight of assets not included in the views significantly. The following three portfolios will therefore have more or less similar weights for the majority of assets. The calculations are based on return data from May 2010 to May 2013 which

again should prevent data mining for the Holding period.
For our calculation of λ, when creating our Black-Litterman portfolios, we have used Average Excess Returns and Average Variance of returns from 1991-2013 via Fama-French data (French, 2015). We have found λ to be 1.187272.
Additionally, our investor views are not thoroughly analyzed and their incorporation in our thesis should more be seen as guidelines for proper use than actual well-researched prospects for the future.
Finally, all Black-Litterman portfolios have been allocated by solving for maximum Sharpe ratio.

7.4.1 Portfolio 8 – BL-1

The first Black-Litterman portfolio is without investor views and is as such mainly based on reverse optimization. The Black-Litterman approach gives the greatest weights to the dominant companies in the market, with the restrictions of the Danish legislative framework, further tightened with our own restriction of a maximum of 5% investment in any single company. The weight percentages of the biggest companies in the portfolio are as such: ADS (5.0%), CBS (5.0%), CMCSA (5.0%), NKE (5.0%) and SKY (5.0%). The portfolio yielded a 14.14% return with a standard deviation of 0.90% in the Data Period (10-13), while the Holding Period (13-15) gave a p.a. return of 26.35% with a standard deviation of 0.69% giving a Sharpe ratio of 38.25.

7.4.2 Portfolio 9 – BL-2

The second Black-Litterman portfolio has two distinctive views; both assigned a 50% uncertainty. The first is that Nike will have a 5% higher return p.a. than Adidas. Adidas has in the last couple of years been in a bit of a slump while Nike has experienced great growth. As previously discussed, Adidas has, very aggressively, attempted to win back some market share with their huge kit sponsoring deals. We thus believe that Nike will be the more profitable company going forward.
The second view is that betting companies will generally have a 5% higher return p.a. than Danish football clubs. Our reason for this assumption is our previously positive PEST analysis for the betting industry and the notorious overspending of football clubs.
The same restrictions as in the previous portfolio are applied. The biggest weight percentages of the portfolio look as such: CBS (5.0%), CMCSA (5.0%), NKE (5.0%), SKY (5.0%) and FL (4.5%).

These views provide a portfolio which in the Data Period (10-13) yielded a 14.43% return p.a. with a standard deviation of 0.90%, while the Holding Period (13-15) gave a p.a. return of 28.15% with a standard deviation of 0.69% equaling a Sharpe ratio of 40.51.

7.4.3 Portfolio 10 – BL-3

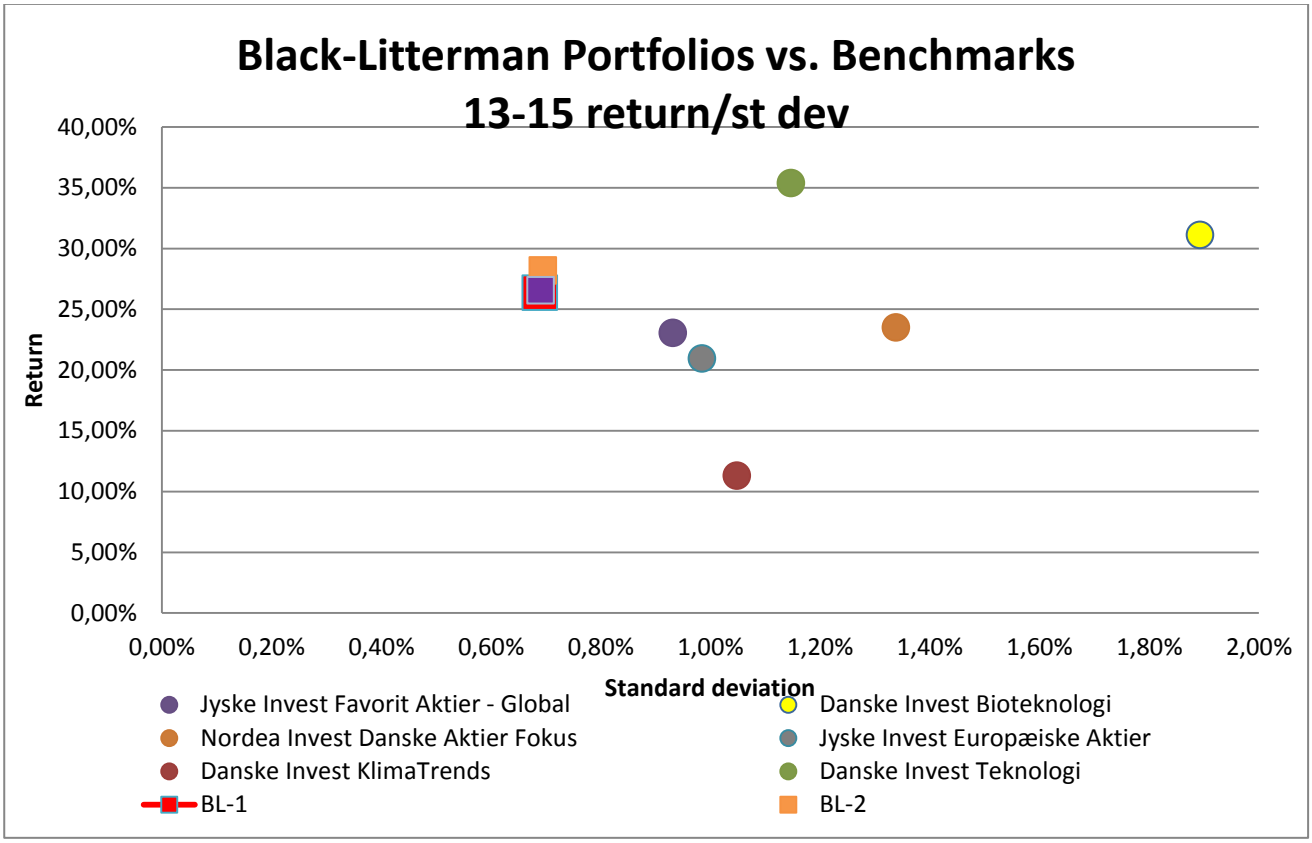
The third Black-Litterman portfolio also has two distinctive views; both assigned a 25% uncertainty. The first is that the four broadcasting companies in the SRIF universe will have a 5% higher return p.a. than the four Portuguese football clubs. This is assumed based on the seemingly never ending possibility of earning a profit on broadcasting sporting events and the again notorious overspending of football clubs coupled with the financial crisis in Portugal. The second view is that the five biggest western sports apparel companies will generally have a 10% higher return p.a. than football clubs located in regions with a population less than 1 million. This is believed because of the positive PEST analysis conducted for Sports equipment and the fact that the gap between bigger and smaller clubs seems to increase.

The same restrictions as in the previous portfolio are applied. The weight percentages of the portfolio look as such: ADS (5.0%), CBS (5.0%), CMCSA (5.0%), NKE (5.0%), and SKY (5.0%). The Data Period yielded a 14.23% return with a standard deviation of 0.90%, while the Holding Period (13-15) gave a p.a. return of 26.54% with a standard deviation of 0.69% giving a Sharpe ratio of 38.43.

Table 8 – Black-Litterman Portfolios

Name	BL-1	BL-2	BL-3
Return 10-15	137,43%	146,06%	138,64%
Return p.a.	18,88%	19,73%	19,00%
Standard Deviation	0,82%	0,82%	0,82%
Sharpe Ratio	22,99	23,92	23,04
Return 10-13	48,71%	49,83%	49,04%
Return 10-13 p.a.	14,14%	14,43%	14,23%
Standard Deviation	0,90%	0,90%	0,90%
Sharpe Ratio	15,74	16,02	15,76
Return 13-15	59,65%	64,22%	60,12%
Return 13-15 p.a.	26,35%	28,15%	26,54%
Standard Deviation	0,69%	0,69%	0,69%
Sharpe Ratio	38,25	40,51	38,43

Graph 10 – BL-portfolios vs. Benchmarks



As seen in Graph 10 the three BL portfolios universally outcompetes four of the Benchmarks, and really only the "Danske Invest Teknologi" seems to be a match due to its higher return, than any of the BL portfolios. However the BL portfolios have more than 25% higher Sharpe ratios than the best benchmark fund, indicating a much better relation between risk and return.
The BL portfolios are at the same time the best performing SRIF portfolios.

7.5 Risk assessment

7.5.1 Beta analysis

It seems fitting to do a beta analysis on our stock universe to shed a different light on the overall risk in regards to the market. We will thus carry forward a beta analysis on the 15 biggest in the SRIF universe to evaluate the risk factor in relation to the market. Based on the extreme differences in market value between the companies in the SRIF universe these 15 stocks comprise 88% of the total equity value of the universe, which makes assumptions drawn from this sample credible to the whole universe.
The 15 companies are traded on 5 different stock exchanges and measuring the beta against any single one of these markets thus seems inadequate. Therefore the stocks have been held up against the MSCI (Morgan Stanley Capital International) Global index as it gives a broad indication of the overall performance for the markets where the stocks are traded. We have used DataStream monthly data from the 1st of May 2005 to the 1st of May 2015, to include both economic recessions and booms in the time period. At the same time we have analyzed the risk free rate from the same data period (French, 2015) in order to get excess return for the time period.

Furthermore, we have conducted a beta analysis of the SRIF 2013 market-weighted and equal-weighted portfolio in relation to the MSCI global index based on DataStream monthly data from 1st of May 2010 to the 1st of May 2015, and again risk free returns from the same time period. The reason for the shorter period is due to our portfolios more limited data availability.
Both analyses will include both standard and adjusted beta, to give a more nuanced picture of the risk associated with investing in the SRIF universe. The adjusted beta has the formula:

$$\frac{2}{3} * \beta + \frac{1}{3} * 1$$

7.5.1.1 The individual beta analysis

As can be seen in Table 9 – β for 15 biggest stocks beta values vary to a great extent with 6 being significantly different from 1. SKY and Paddy Power, both have significantly lower betas than 1 whereas CBS, Dicks Sporting Goods, Gildan and Lululemon all have significantly higher beta values than 1, all with 95% confidence.

This gives a slight indication that the majority of the stocks are not overly correlated to market swings and as such more robust during economic recession.

When the beta values - both standard and adjusted - are multiplied with market weights or given equal weights, we can identify the overall beta for the portfolios. For the market weighted portfolios the overall beta equals 1.13 and 1.09, respectively, when using the standard and adjusted beta values (β*mW and Adj. β*mW). Putting equal weights to the 15 stocks, the portfolio betas equals 1.23 and 1.15, respectively, when using the standard and adjusted beta values (β*eW and Adj. β*eW).

Lastly, none of the 4 beta values are significantly different from 1, with 95% confidence, and it does not seem that the risk factor in regards to the global market is worrisome.

Table 9 – β for 15 biggest stocks

Company name	Market Cap 2013	Market weight	Stock Exchange	Ticker	β[3]	Adj. β	β *mW	Adj. β *mW	β *eW	Adj. β *eW
Comcast Corporation	503.763	30,70%	NASDAQ	CMCSA	**0,95**	**0,97**	0,292	0,297	0,063	0,064
Nike, Inc.	256.255	15,62%	NYSE	U:NKE	**0,89**	**0,93**	0,139	0,145	0,059	0,062
CBS Corporation	150.015	9,14%	NYSE	U:CBS	**2,18***	**1,79**	0,199	0,163	0,145	0,119
SKY PLC	119.692	7,29%	London SE	SKY	**0,47****	**0,64**	0,034	0,047	0,031	0,043
Adidas	124.064	7,56%	Frankfurt SE	D:ADS,	**1,20**	**1,13**	0,091	0,086	0,080	0,076
Lululemon Athletica	47.921	2,92%	NASDAQ	@LULU	**2,57***	**2,05**	0,075	0,060	0,172	0,137
Yue Yuen International Holdings Ltd	32.243	1,96%	Hong Kong SE	K:YUEN	**0,76**	**0,84**	0,015	0,016	0,050	0,056
Foot Locker, Inc.	29.407	1,79%	NYSE	U:FL	**1,34**	**1,23**	0,024	0,022	0,089	0,082
Puma AG	26.383	1,61%	Frankfurt SE	D:PUM	**1,16**	**1,11**	0,019	0,018	0,078	0,074
Dicks sporting goods	27.043	1,65%	NYSE	U:DKS	**1,53***	**1,36**	0,025	0,022	0,102	0,090
Gildan Activewear, Inc.	27.997	1,71%	NYSE	C:GIL	**1,59***	**1,39**	0,027	0,024	0,106	0,093
Under Armour, Inc.	26.784	1,63%	NYSE	U:UA	**1,33**	**1,22**	0,022	0,020	0,088	0,081
PADDY POWER	23.440	1,43%	London SE	PAP	**0,39****	**0,59**	0,006	0,008	0,026	0,039
WILLIAM HILL PLC	32.239	1,96%	London SE	WHM	**0,96**	**0,97**	0,019	0,019	0,064	0,065
Sports Direct International PLC	24.626	1,50%	London SE	SPD	**1,12**	**1,08**	0,017	0,016	0,075	0,072
Top 15 Market Cap	**1.451.873**	**88,48%**				**Portfolio β**	**1,13**	**1,09**	**1,23**	**1,15**

[3] *Significantly higher than 1 **Significantly lower than 1

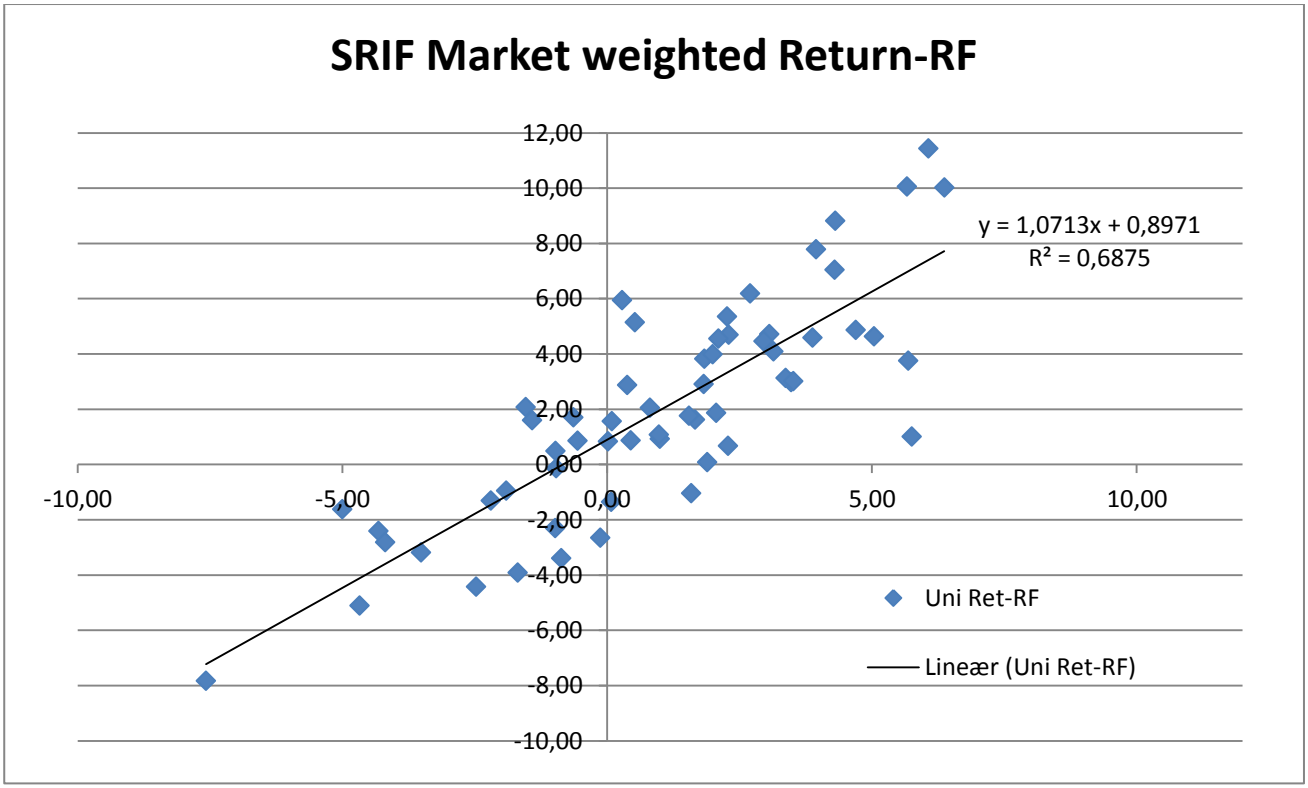
7.5.1.2 The SRIF portfolio betas

These two beta analyses are fundamentally different from the previous section as they have used the combined excess return of the SRIF portfolios which are regressed against the MSCI Global index and thus are only based on 5 years of data. The betas have been calculated based on monthly returns of the SRIF portfolios and the MSCI from May 2010 to May 2015.

Starting with the 2013 Market weighted portfolio, it can be seen in Graph 11 that the beta value is found to be 1.07 which is not significantly different from 1. The alpha of 0.90 is however significantly different from 0 which is positive, but not a feature we will dig deeper into now. The R^2 is 0.69 which means that 69% of the variation in excess returns can be explained by market movements.

In the end the beta value of 1.07 and the adjusted beta of 1.05 are very close to the found values in the previous section, and the differing time period does not seem to matter greatly.

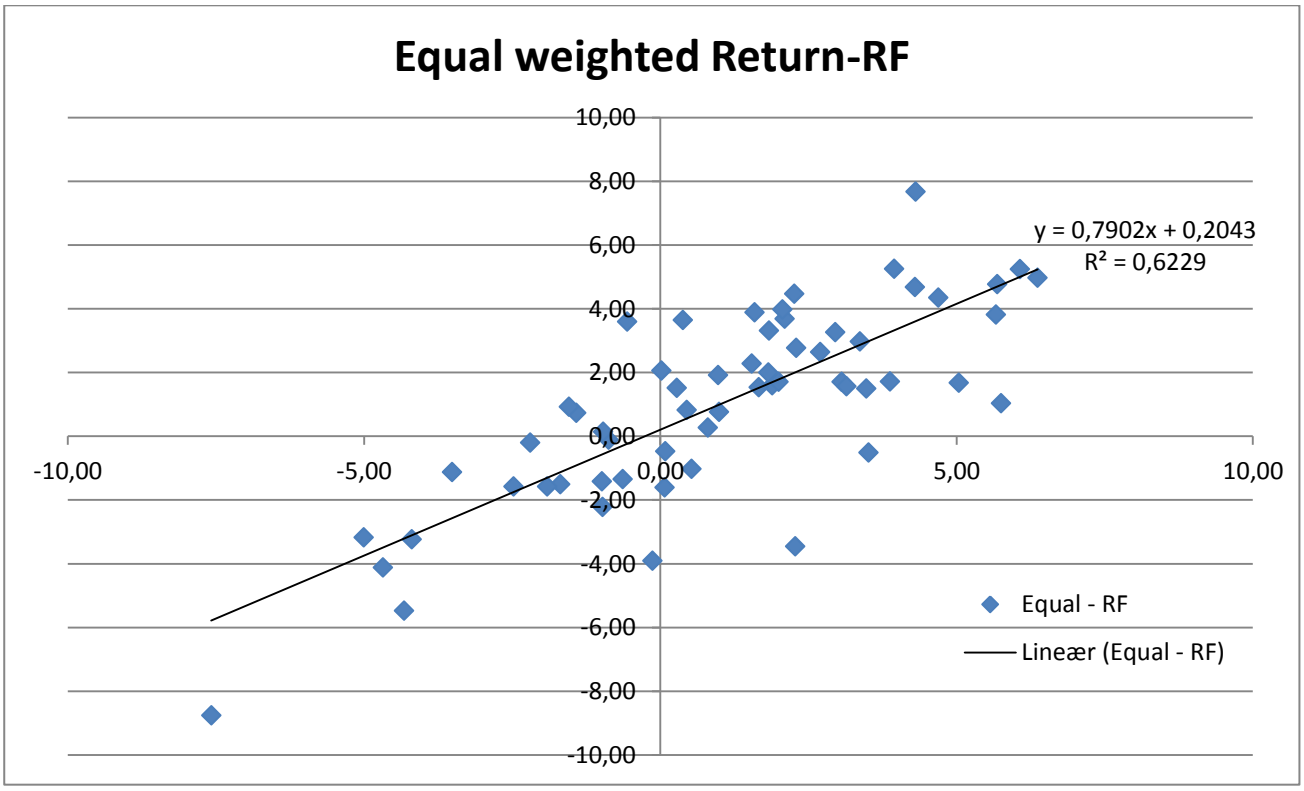
Graph 11 – Beta regression market weighted



The equal weighted SRIF portfolio beta could however differ to a greater extent, as 70 more assets are included compared to the individual beta analyses.

The results give support to this suspicion as Graph 12 shows a beta value of 0.79 which is significantly different from 1. The Alpha value is insignificant and the R^2 is 0.62, again suggesting a good fit. The reason for the low beta of 0.79 and the derived adjusted beta of 0.86 can be that the smaller stocks in the SRIF universe have lower correlation with the market. The football clubs could be one example of such stocks. An investment in an equal weighted fund would thus have low market correlation, making the individual risk factors of the portfolio that much more important.

Graph 12 - Beta regression equal weighted



7.5.2 Downside risk

In Post-modern portfolio theory, there has been a focus of the difference between upside and downside risk, since the latter is the only real risk to the rational investor. Therefore, we have taken

one portfolio from each of the three different asset allocation parts and compared them to the three best performing benchmark funds, in terms of Sharpe and Sortino ratio. All six funds have been based on the timeline of the Holding period (13-15). The three portfolios we have chosen are: 3 – Market Weighted, 7 – Maximize Sharpe Ratio and 8 – BL – 1 no views as they are expected, on a non-hindsight basis, to be the most objective and probable allocation models used. The results can be seen in Table 10 and in Graph 13 where a few things are worth noticing.

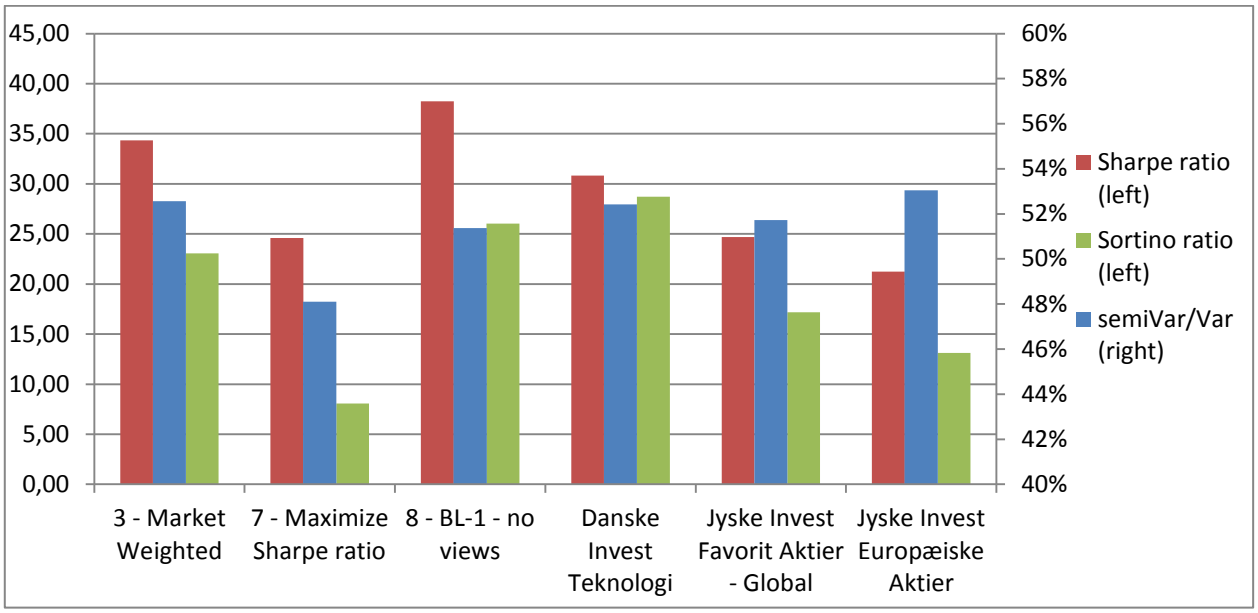
First of all there is the semi-variance divided by the standard variance, which gives an estimate of how many observations that lie left of the average on the distribution curve. These three numbers proves that the SRIF portfolios are fully competitive, some even better, with the three benchmark funds. The standard deviation and semi-standard deviation further verifies that SRIF is less risky than the benchmarks.

Second of all, both Sharpe and Sortino ratios are competitive in almost all cases, only portfolio 7's Sortino ratio comes across on the low side due to the portfolios relatively low return. But the rest of the portfolios indicate that the SRIF portfolios are competitive. We have used the average yearly return of Morningstar funds, of 11.50%, as MAR, to find the Sortino ratio.

Table 10 – Downside risk

	3 - Market Weighted	7 - Maximize Sharpe ratio	8 - BL-1 - no views	Danske Invest Teknologi	Jyske Invest Favorit Aktier - Global	Jyske Invest Europæiske Aktier
Variance	0,00007	0,00005	0,00006	0,00013	0,00009	0,00010
St. dev.	0,82%	0,71%	0,80%	1,15%	0,93%	0,98%
Semi-Variance	0,00004	0,00002	0,00003	0,00007	0,00004	0,00005
Semi-deviation	0,60%	0,49%	0,57%	0,83%	0,67%	0,72%
Semi-Var/Var	52,57%	48,10%	51,37%	52,42%	51,73%	53,05%
Average daily ret	0,09%	0,06%	0,09%	0,13%	0,09%	0,08%
13-15 p.a. return	25,30%	15,48%	26,35%	35,36%	23,01%	20,92%
Sharpe ratio	34,35	24,61	38,25	30,83	24,70	21,24
Sortino ratio	23,07	8,05	26,03	28,73	17,18	13,13

Graph 13 – Downside risk



7. 6 Summary

Overall, 9 out of 10 portfolios have shown to be competitive and, in the majority of the times, be indisputably better than most of the benchmark funds based on Sharpe ratios. This is an important observation as these benchmark funds were all 4 or 5-star rated by Morningstar. When all BL portfolios outperform the benchmark funds significantly, in terms of Sharpe ratio, and the entire range of simple portfolios cluster around the same Sharpe ratio as the best performing of the six funds (Danske Invest Teknologi), it seems that SRIF should have a future in the world of finance. The evaluation of the downside risk further justifies the notion of SRIF to be a profitable investment. The three most objective SRIF portfolios (see section 7.5.2 for reasoning) and the three best performing benchmark funds have been compared based on their Holding period (13-15) performance in Table 11.

Table 11 – Top benchmark funds vs. top portfolios

Name	Danske Invest Teknologi	Jyske Invest Favorit Aktier - Global	Jyske Invest Europæiske Aktier	3 - Market weights	7 - Max-SR	8 - BL-1
Morningstar rating	5	5	4	-	-	-
Return 13-15 p.a.	35.36%	23.01%	20.92%	25.30%	15.48%	26.35%
St. Deviation	1.15%	0.93%	0.98%	0.74%	0.63%	0.69%
Sharpe Ratio	**30.83**	**24.70**	**21.24**	**34.35**	**24.61**	**38.25**

8.0 Discussion

The aim of this thesis was to assess whether a mutual fund made up of companies in the sports network could provide competitive results, in terms of risk and return, compared to relevant benchmarks. Since our research has shown highly profitable portfolios, together with very competitive measures of risk contra return, one is wondering why the idea of setting up SRIF has not been pursued by investors with deep enough pockets or established investment banks.
The idea was originally researched in 2010 (Jørgensen & Vesterheden, 2010), but because of the financial crisis, their analysis, based on data from 2005 to 2009 provided unattractive returns. The overall assessment however indicated competitive results especially in regards to risk. Obviously no one cares about low standard deviation if the returns are poor, which could explain the hesitation from potential investors and banks at the time. At the same time, there was an extreme focus on minimizing risk, which the creation of a new themed mutual fund does not correlate greatly with. The timing of introducing SRIF obviously was not there, but whether that is the only reason why SRIF still does not exists is however unlikely.

Another possible explanation for SRIF not being an investment opportunity could be the eroded reputation of sport clubs when it comes to acting economically responsible. The general notion of sport clubs is that the only stakeholders who should expect positive monetary rewards are players, and staff employed in the sector, whereas investors should not get involved if monetary benefits are the goal. A feature that highlights this fact is the recent increase in European football clubs purchased by extremely wealthy individuals which then consider the club as a hobby project. The most famous example is Roman Abramovich's takeover of Chelsea F.C. which he spent £2 billion on during the course of 10 years according to Deloitte (Tongue, 2013). His approach has since been copied by a number of other individuals or investor groups, spending astronomical sums without the expectation of future monetary rewards. The reason we only mention European football clubs as sport clubs is because they comprise the majority of sport clubs in the SRIF universe, whereas North American sport clubs are privately owned and thus not possible to invest in. Clubs not owned by wealthy investors have however also had trouble in maintaining economic balance as they try to compete with the "billionaire clubs" which three of the Danish football clubs represented in SRIF highlight (Møldrup, 2015).

The apparent lack of interest in SRIF must therefore be due to ill information about the assets within the fund. These assets are not centered on sport clubs, but on the sports network which,

contrary to the clubs, is highly profitably. The investor segment should as such be there. Both because the SRIF portfolios show great performance, but also because 70% of Danish investors are male (Jørgensen & Vesterheden, 2010) which the majority of sports fans are as well (Andersen, 2015). The question is now whether these two groups overlap to at least some extent. This claim is hard to conclusively deny, and therefore we assume that the demand from individual investors is there, but that banks and investment houses need to supply the option.

8.1 SRIF versus Benchmarks

One could ask why these specific benchmarks were chosen, and why there were only 6 in total. This was done because as we discussed earlier, SRIF has yet to become more than a fictive portfolio because of the hesitation towards sport as a profitable industry. Therefore, we believe that SRIF will only be taken seriously if it can provide returns on par with some of the greatest performing Danish mutual funds. Had we compared the SRIF funds to more average performing benchmarks, we believe that our findings would be overlooked or at least not be considered a viable option. Morey (2003) found that 5-star rated Morningstar mutual funds produced inflows far greater than normal inflows. Therefore, we assume that SRIF needs to be at least on par with 5-star rated funds if significant demand is to be expected. The limited number of benchmarks seemed as such preferable since they are all highly rated thus making comparison easier.

The SRIF portfolios generally performed very well compared to their benchmarks, both in terms of return and risk. Especially the portfolios using the Black-Litterman framework have produced outstanding results and Sharpe ratios far outcompeting any of the benchmarks. We however chose portfolio 3, 7 and 8 to evaluate in terms of downside risk as they were the three portfolios which, before being performance evaluated, were believed to best reflect the value of the sport network.

Table 12 – Top benchmark and portfolio comparison

Name	Danske Invest Teknologi	Jyske Invest Favorit Aktier - Global	Jyske Invest Europæiske Aktier	3 - Market weights	7 - Max-SR	8 - BL-1
Morningstar rating	5	5	4	-	-	-
Return 10-13 p.a.	7,84%	10,22%	8,44%	10,51%	27,11%	14,14%
St. dev.	1,28%	1,12%	1,34%	1,00%	0,77%	0,90%
Sharpe Ratio	6,11	9,13	6,29	10,55	35,26	15,74
Return 13-15 p.a.	35,36%	23,01%	20,92%	25,30%	15,48%	26,35%
St. dev.	1,15%	0,93%	0,98%	0,74%	0,63%	0,69%
Sharpe Ratio	30,83	24,70	21,24	34,35	24,61	38,25

It is interesting to see that some of the portfolios also show competitiveness over the whole 5 year data period. Most of the portfolios (except the equal weighted) are however built upon data from the first three years, and conclusions based on these numbers would be considered data mining.
But since portfolio 3's only "crime" in this regard is to have used the market weights from May 2013, it is interesting to notice that it outperforms all three benchmarks as it has both higher returns and lower standard deviation, which in turn gives it a higher Sharpe ratio. One could argue that the market weights of 2013 tell something about which companies the markets have valued the most. But since 2013 market values does not tell anything about the 2010 counterparts and whether the companies have grown or lost value since then, a cautious conclusion is therefore not considered hypocritical.

8.2 Weaknesses

8.2.1 Financial

We acknowledge that we do not have all the answers and a definite outlook towards the future in terms of future stock performance for the assets included in the SRIF universe. More extensive research on all industries included in SRIF could have been done, and especially on the ones where an industry analysis is absent in this thesis. However, due to the time and space constraints, present in this thesis, we chose to analyze two of the main industries, namely sports apparel/equipment and sports betting. Other relevant industries could include media and broadcasting. Lastly, a general assessment of the competitive landscape for football clubs in terms of economic stability could have

been beneficial.
A more thorough analysis of the SRIF universe, other than industry analyses, could be valuations of each individual asset. As that would comprise 85 individual projects, collaboration with an investment bank would be desirable. This collaboration would not only give each asset a financial rating, but create additional benefits, which we will discuss next.

We have until the very end of the process tried to get in contact with the bigger investment banks in Denmark, but, as we have been forced to realize, it is a goal that will not be fulfilled. The reason for our attempt to create contact is first and foremost the thesis' increased credibility if an assessment of the SRIF by an investment bank had been provided. We believe that such an expert opinion could point to the industry risk factors and general risk level of some of our portfolios compared to other mutual funds. This would have enabled us to evaluate SRIF, not only on standard deviation and beta values, but also the aforementioned 1-7 risk scale used by our benchmark funds' investment banks. Furthermore, we believe that they could have introduced us to their method of construction mutual funds, which would help us to further optimize the asset allocation method of the portfolio.

Even though this thesis has made an analysis of administration costs and fees for mutual funds it has not been applied to any of the ten portfolios. As explained in section 7.0.1 this was done on the basis of creating a more accurate ground of comparison. The thorough reader of this thesis would therefore probably wonder why it was deemed relevant, which there is a simple answer to. The cost structure is included in this thesis so the reader and/or possible investor can get a more precise measure of the actual realized returns of SRIF.

Finally, none of the portfolios have been rebalanced during the two year holding period. This could possibly have created some even better performing portfolios but there is no guarantee of that. The lack of rebalancing was mainly based on the relatively short time period of investment and the need for rebalancing therefore seemed unnecessary. At the same time, we have no data on how many times our benchmarks were rebalanced, and therefore we have chosen not to do it all. In this way, we are certain that we have not used rebalancing to outperform the benchmarks. The portfolios should as such produce positive results because of the overall good idea of investing in SRIF, not because it has well-performing mutual fund managers.

8.2.2 Time frame

The time frame for our analysis is only 5 years, with the evaluation period being only 2 years, which in terms of macroeconomic periods can seem insignificant. We chose this timeframe due to the availability of data for a significant number of assets (enough to create a well-diversified portfolio) that correlated with our definition of SRIF. We acknowledge that the last 5 years have been a profitable period to hold stocks, thus making it easier for most mutual funds to produce satisfactory results. Taking the MSCI global index as an example, it has produced a 11.8% year on year return on a five year basis. But despite the overall positive returns, there will always be made relative comparisons, since the phrase "beating the market" has always been crucial. There seems to be a notion that a mutual fund has only performed satisfactory if it beats its benchmark. But as SRIF has no relevant benchmark it is harder to assess its relative performance.

A solution to extending the time period could have been to include the exact same assets as Jørgensen & Vesterheden (2010) used for their original analysis of the idea. But despite the similarities of the two investment universes, there were a number of differing assets based on; different assumptions, subjective assessment of overall fit with SRIF and general aim of this thesis. It would simultaneously demand access to their data, a feature, which we did not look into. Using their investment universe would also have excluded companies publicly listed after 2005 which we believe would diminish the relevance of SRIF. We however still believe that their portfolios are a great indication of how SRIF would perform during financial crises and as such a good reference point if wanting a more extensive timeframe for evaluation.

8.2.3 Theoretic allocation models

The number of allocation models included in this thesis is not extensive, but we believe that the ones included are the most relevant to the aim of proving SRIF as a concept. How to further improve the allocative methods is, as previously discussed, a job for the bank willing to create the fund. Jørgensen and Vesterheden (2010) also came to the conclusion that the Black-Litterman asset allocation produced the best results for a sports themed mutual fund, which is why this theory in particular was chosen. We acknowledge that a much deeper analysis of possible asset allocation models could have been beneficial, but, since the overall aim of this thesis is to prove SRIF as a generally good concept, it was chosen not to.

8.2.4 Limited devotion to minor sports

Through our analysis the term sport has been used very broadly, including everything from football to petanque. A lot of our examples have however only included the big 4 Northern American sports and football. These 5 sports have been described by numerous examples of sports deals (media contracts, kit sponsorships, etc.) perhaps creating the suspicion by the reader that a lot of sports have been forgotten. But football have been very dominating in the description of the European sports market, and Basketball, Ice hockey, Baseball and American football in the North American counterpart due to the fact that these sports are responsible for the majority of global sports revenue (AT Kearney, 2014). One could argue that sports such as golf and tennis also have some of the highest paid athletes in the world, but that income is centered on a handful of athletes where the Premier League for example have at least 400 hundred players earning an average of £2.3 million a year (The Telegraph, 2014). Therefore, we believe it safe to assume that in terms of revenue generation inside the sports network, these 5 sports have the greatest influence.

However, there are still complications, since not all companies in SRIF are affected by either of the big-5 sports directly and one could argue that the lack of focus on a specific region dilutes the overall assessment of the future for sports in general. We however believe that the biggest companies in SRIF are becoming global players and as such are affected by market trends in a number of geographic regions.

8.2.5 Market assessment

The number of sports apparel/equipment companies in SRIF is extensive and could easily be a market where competiveness could get extremely fierce if the overall growth in the sport industry is not present. This would ultimately create negative returns for this group of companies, which would be reflected in overall performance of SRIF. However, our assessment of the current competitive landscape for some of the industries present in SRIF, paints a picture of continuingly profitable industries. We acknowledge that entire papers and reports could be written about some of the industries apparent in the SRIF universe and our analyses may as such not be adequate. As we cannot foresee the future we recognize that SRIF is fragile to sudden changes in future growth rates

inside the sport industry. The issue of not knowing the future is however not one that is exclusive to the SRIF portfolios, but a general complication correlated with investing.

8.2.6 The network theory

Even though network theory was applied in this thesis, to explain the strong interdependency between the actors of the sport network, only the interaction between sport clubs, media and sponsors had a literary review. This was due to a lack of research on the subject, and a literary review on the remaining actors in the sport network is therefore not present in the thesis. This is unfortunate as such research might have been able to further verify our assumption that the sport network is highly interdependent and therefore robust.

Government is often considered a key actor of a network, but has for the main part been left out of this thesis. This is the case because government as a concept is not relevant for SRIF. Furthermore, it is out of this thesis' scope to assess the various political landscapes present to the SRIF-included companies, with the PEST-analyses serving as the lone exception.

9.0 Conclusion

The aim of this thesis was to test whether a mutual fund comprised of assets from the sports network could be competitive with relevant benchmarks. The results show that 9 out of 10 Sport-Relations Investment Fund portfolios are very competitive and 6 out of 10 portfolios show higher Sharpe ratios than any of the benchmarks during the Holding period (2013-15).

Influenced by the research done by Jørgensen and Vesterheden (2010) the purpose of this thesis was to analyze whether a different time frame could shed new light on the hypothesis of investing in the sport network. Their research showed promise of competitive funds, but was heavily influenced by the economic recession in their data period (2005-09).

To add to the credibility of the SRIF portfolios we conducted an analysis of the Danish legislative framework, where especially the 5-10-40 rule influenced the restrictions on asset allocation. The Danish legal framework concerning investment funds is based on the UCITS directive published by the European Union.
SRIF was considered an active investment fund because the asset allocation does not follow any index or market, but has been actively allocated by the authors. The average cost of a Danish mutual fund is 1.54% of invested capital p.a. and the potential investor should expect the cost of SRIF to be in that proximity.

The sport network is rather unique and through a network theory analysis the interdependency of the key actors within the network was highlighted. The main actors within the sport network were found to be sport clubs, sponsors, sports equipment and apparel companies, sports betting firms, media, agencies, sport facility operators and sport fans. All these actors circle around the sport industry which comprise the center of the network.
Not all actors of the sport network qualified for inclusion in SRIF due to their unavailability as investable assets. We highlighted a set of guidelines for inclusion in SRIF and required five years of daily price data. After the selection process the SRIF universe came to consist of 85 assets, with the companies inside sports apparel, sport clubs, media and sports betting having the majority of market weight.

In order to optimize the asset allocation process of SRIF, a review of portfolio theory was conducted. From modern portfolio theory, the main contributions to this thesis were the Sharpe ratio, the efficient frontier and the tradeoff between risk and return. These factors are the main

components of mean-variance optimization.
From post-modern portfolio theory the Prospect theory was reviewed. This introduced a new way of assessing investor behavior, where the concept of downside risk came to play a more significant role. Downside risk differentiates between positive and negative variance, with only the latter being perceived as true risk.
Finally, the Black-Litterman model was reviewed. The model uses reverse-optimization and investor views to create an alternative to modern portfolio mean-variance optimization. This model is assumed to have more realistic asset allocation, as it takes its point of departure in the market weights.

Through our asset allocation section we have created 10 portfolios based on simple allocation, mean-variance allocation and Black-Litterman allocation. All portfolios were created based on data from May 1, 2010 to May 1, 2013 (Data period) and their performance were evaluated over the subsequent two years (Holding period) and compared to six benchmark funds that all have a Morningstar rating of 4 or 5 stars.

The results of the SRIF portfolios were in general highly competitive compared to the benchmark funds. The SRIF portfolios with the most realistic asset allocation methods, together with the three best performing benchmarks are highlighted in Table 13. Only "Danske Invest Teknologi" can compete with the SRIF portfolios when it comes to Sharpe ratio. It is clear that over the last two years, a Sport-Relations Investment Fund would have been a very profitable investment, outperforming 5 out of 6 highly rated benchmark funds.

Table 13 – SRIF performance

	Danske Invest Teknologi	Jyske Invest Favorit Aktier - Global	Jyske Invest Europæiske Aktier	SRIF1 - Equal Weighted	SRIF3 - Market Weighted	SRIF7 - Max Sharpe ratio	SRIF8 - BL-1 - no views
Morningstar rating	**5**	**5**	**4**	-	-	-	-
Return 13-15	83.23%	51.31%	46.22%	44.36%	57.00%	33.35%	59.65%
Return p.a.	35.36%	23.01%	20.92%	20.15%	25.30%	15.48%	26.35%
St. Deviation	1.15%	0.93%	0.98%	0.67%	0.74%	0.63%	0.69%
Sortino Ratio	28.73	17.18	13.13	18.21	23.07	8.05	26.03
Sharpe Ratio	30.83	24.70	21.24	30.00	34.35	24.61	38.25

10.0 Perspective

As the benchmark funds show, the last couple of years have been very profitable to investors holding stock based mutual funds. This positive market trend has naturally had an impact on the SRIF portfolios which also show very good results. Further interesting research could include an extension of the analysis's time frame, to get a clearer picture of the long run performance.
It is however clear that SRIF has provided market beating returns compared to risk in the last couple of years, and a more practical approach concerning the actual creation of SRIF would also serve as a natural extension of our research.

We believe that the main reason for the hesitation to create SRIF is the word "sport". Sport clubs, especially the European, have a reputation of being unprofitable. This is reflected by the fact that the majority of sport clubs included in SRIF have realized negative returns over the last 5 years. However, using our portfolio "8 – BL – no views" as an example, sport clubs only comprise 6.5% of the entire portfolio. Therefore, this aversion against investing in a Sport-Relations Investment Fund is based upon misperception, and future projects should therefore analyze how this misperception can be changed.

The inclusion of sport clubs can however also be used in a number of positive ways. A lot of people are very passionate about sports, a passion that we believe it fair to assume, is greater than their passion for economic market trends and investable assets. This passion could as such work to SRIF's advantage as it could have an influence on an investor's choice of fund. Whether an investor, faced with the choice between two equally performing funds, would choose the fund he feels most passionate about, is worth further exploratory research. As a lot of people identify themselves as sports fans, SRIF could potentially have a significant competitive advantage.

Another interesting research topic could be to assess the influence of investor relations. A significant share of stocks in football clubs usually results in either free or high discounts on tickets to a couple of home games every season. As SRIF include 85 assets it could be interesting to investigate what other benefits there is associated with owning stocks in these companies. The companies include bowling centers, ski resort operators, sports apparel companies and betting companies, making the potential investor benefits very diverse.
Whether these sorts of investor benefits have any potential relevance to the marketability of SRIF is an interesting topic worthy of future consideration.

If the fact that sport clubs are included in the fund is the main reason for investment houses' hesitation in setting up SRIF, it creates a need for additional research regarding portfolios without any sport clubs. This thesis has created an equally-weighted portfolio with the exclusion of the sport clubs in the SRIF universe. The performance was however not significantly different from that of the equally-weighted portfolio that included sport clubs. Further portfolios with this exclusion were therefore deemed irrelevant to this thesis, but could potentially be worth the consideration of future researchers.

Lastly, a future collaboration with an investment bank would be of great benefit to the expansion of this research. Their insights on how to market mutual funds could be of great value since they have very different characteristics compared to traditional consumer products. Therefore, regular academic marketing frameworks as the 4P's does not seem fitting, and the specific industry knowledge of investment banks would be very valuable.
Furthermore, the risk assessment of a mutual fund also requires industry knowledge. We have tried to appropriately analyze SRIF with relevant benchmark funds, but acknowledge that investment banks have a far more extensive expertise in this area. Collaboration with an investment bank is thus deemed crucial for future researchers in order to expand on this thesis.

11.0 Bibliography

The Guardian, 2015. *Football: The Guardian.* [Online]
Available at: http://www.theguardian.com/football/2015/apr/28/bayern-munich-adidas-kit-deal
[Accessed 12 June 2015].

Aczel, A. D. & Sounderpandian, J., 2006. *Complete Business Statistics.* 6th ed. s.l.:McGraw-Hill.

Agresti, A. & Franklin, C., 2009. *Statistics - The Art and Science of Learning from Data.* 2. ed. Upper Saddle River, NJ: Pearson.

Alpert, B. N., Justice, P., Serhan, A. & West, C., 2015. *Global Fund Investor Experience Study - June 2015,* s.l.: Morningstar.

Andersen, O. S., 2015. *Hvordan bruger B.T. sporten* [Interview] (21 Maj 2015).

Anderson, P. M., 2012. The Regulation of Gambling Under U.S. Federal and State Law. In: *Sports Betting: Law and Policy.* The Hague: Asser, pp. 854-869.

Arnerich Massena & Associates, Inc., 2007. *Active versus passive investment management: Puttingthe debate into perspective,* s.l.: Arnerich Massena & Associates, Inc..

AT Kearney, 2014. *Winning in the Business of Sports,* s.l.: AT Kearney.

Baks, K. P., Metrick, A. & Wachter, J., 2001. Should investors avoid all actively managed funds? A study in Bayesian Performance Evaluation. *The Journal of Finance,* 56(1), pp. 45-85.

Banjo, S., 2014. Inside Nike's Struggle to Balance Cost and Worker Safety in Bangladesh. *Wall Stree Journal,* 21 April.

BBC, 2014. *BBC Business.* [Online]
Available at: http://www.bbc.com/news/business-28282444
[Accessed 12 June 2015].

BBC, 2015. *Business: BBC.* [Online]
Available at: http://www.bbc.com/news/business-31379128
[Accessed 4 May 2015].

BBC, 2015. *Fifa corruption crisis: Key questions answered.* [Online]
Available at: http://www.bbc.com/news/world-europe-32897066
[Accessed 19 July 2015].

Beirholm, T., 2008. *Sportssponsering – det' genialt, det der……,* Copenhagen: Aegis Media.

Black, F. & Litterman, R., 1992. Global Portfolio Optimization. *Financial Analysts Journal*, September, 48(5th), pp. 28-43.

Blake, C. R. & Morey, M. R., 2000. Morningstar Ratings and Mutual Fund performance. *Journal of Financial and Quantitative Analysis*, September, pp. 451-483.

Blindkilde, S., 2003. *Morningstar Rating™ - hvad kan den bruges til?.* [Online]
Available at: http://www.morningstar.dk/dk/news/89246/morningstar-rating-hvad-kan-den-bruges-til.aspx
[Accessed 15 May 2015].

Bodie, Z., Kane, A. & Marcus, A. J., 2009. *Investments.* 8th ed. New York: McGraw-Hill.

Bodie, Z., Kane, A. & Marcus, A. J., 2011. *Investments and Portfolio Mangement.* 9. ed. New York, NY: McGraq-Hill.

Børsen, 2014. *Børsen Top1000.* [Online]
Available at: http://top1000.borsen.dk/virksomheder/viasat/n%c3%b8gletal
[Accessed 15 June 2015].

Chalmers, A. F., 2011. *What is this thing called science.* 3rd ed. s.l.:Open University Press.

Danske Invest, 2015. *Produktoversigt: Danske Invest.* [Online]
Available at:
http://www.danskeinvest.dk/web/show_page.product_overview?p_nId=1077&p_nFundGroup=75
[Accessed 15 May 2015].

Deloitte, 2013. *Deloitte Annual Review of Football Finance 2013,* Manchester: Deloitte.

Dibb, S., Simkin, L., Pride, W. M. & Ferrell, O. C., 2006. *Marketing: Concepts and Strategies.* 5th ed. Mason: South-Western CENGAGE Learning.

Elton, E. J. & Gruber, M. J., 1997. Modern Portfolio Theory, 1950 to date. *Journal of Banking & Finance*, Issue 21, pp. 1743-1759.

Elton, E. J., Gruber, M. J., Brown, S. J. & Goetzmann, W. N., 2011. Chapter 10 - International Diversification. In: *Modern Portfolio Theory and Investment Analysis.* 8th ed. Hoboken N.J.: Wiley, pp. 208-234.

Erhvervs - og Vækstministeriet/Finanstilsynet, 2013. *Lov om Investeringsforeninger m.v.*. Copenhagen: Finanstilsynet.

Forbes, 2013. *Forbes: Business.* [Online]
Available at: http://www.forbes.com/sites/jasonbelzer/2013/06/24/the-worlds-most-valuable-sports-agencies-2/
[Accessed 15 May 2015].

Fortunato, J. A., 2000. Public Relations Strategies for Creating Mass Media Content: A Case study of the National Basketball Association. *Public Relations Review,* 26(4), pp. 481-497.

French, K. R., 2015. *Current research returns.* [Online]
Available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
[Accessed 5 June 2015].

Garcia-del-Barro, P. & Szymanski, S., 2009. Goal! Profit maximization and win maximization in football leagues. *Review of Industrial Organization*, 34(1), pp. 45-68.

Geambasu, C., Sova, R., Jianu, I. & Geambasu, L., 2013. *RISK MEASUREMENT IN POST-MODERN PORTFOLIO THEORY: DIFFERENCES FROM MODERN PORTFOLIO THEORY.* s.l.:The Bucharest Academy of Economic Studies.

Gel, Y. R. & Gastwirth, J. L., 2008. A robust modification of the Jarque–Bera test of normality. *Economic Letters*, Issue 99, pp. 30-32.

Gitman, L. J. & Joehnk, M. D., 2003. *Fundamentals of Investing.* 9th ed. Boston: Pearson.

Grix, J. & Phillpots, L., 2010. *Revisiting the 'Governance Narrative',* Birmingham: Department of Political Science and International studie, Univerisity of Birmingham.

Hall, S., Szymanski, S. & Simbalist, A. S., 2002. Testing CausalityBetween Team Performance and Payroll. *JOURNAL OF SPORTS ECONOMICS,* 3(2), pp. 149-168.

Hirt, G. A. & Block, S. B., 2006. *Fundamentals of investment management.* 8th ed. New York: McGraw-Hill/Irvin.

Hummels, D., 2007. Transportation Costs and International Trade in the Second Era of Globalization. *Journal of Economic Perspectives*, Summer, Issue 3, pp. 131-154.

Hu, S., Malevergne, Y. & Sornette, D., 2009. *Investors' Optimism: A Hidden Source of High Markups in the Mutual Fund Industry* , Zurich: Department of Management, Technology and Economics, ETH Zurich.

Hyatt, C. G., Sutton, W. A., Foster, W. M. & McConnell, D., 2013. Fan involvement in a professional sport team's decision making. *Sport, Business and Management: An International Journal*, 3(3), pp. 189-204.

Idzorek, T. M., 2005. *A STEP-BY-STEP GUIDE TO THE BLACK-LITTERMAN MODEL: Incorporating user-specified confidence levels* , Chicago: Ibbotson Associates.

Jyske Invest, 2015. *Afdelinger: Jyske Invest.* [Online]
Available at: http://jyskeinvest.dk/afdelingerogkurser
[Accessed 15 May 2015].

Jørgensen, C. G., 2007. *Danish SRI Funds - An Analysis of their Financial Performance,* Copenhagen: Copenhagen Business School.

Jørgensen, K. N. & Vesterheden, J., 2010. *Is sport ready to go pro?,* Copenhagen: Copenhagen Business School.

Kaburakis, A., 2012. European Union Law, Gambling, and Sport Betting: European Court of Justice Jurisprudence, Member States Case Law, and Policy. In: P. M. Anderson, ed. *Sports Betting: Law and Policy.* The Hague: Asser, pp. 27-97.

Kahneman, D. & Tversky, A., 1979. Prospect Theory: An Analysis of Decision under Risk. *Econometrica,* 47(2), pp. 263-292.

Kang, C., 2015. *The Washington Post.* [Online]
Available at: http://www.washingtonpost.com/business/economy/bidding-war-between-networks-sports-leagues-will-increase-price-of-cable-tv/2015/01/23/d0cb19f4-9db8-11e4-a7ee-526210d665b4_story.html
[Accessed 12 June 2015].

Kern, D., 2014. Active and Passive. *Investment Advisor*, October, pp. 36-42.

Kjærgaard, J., 2012. *Idættens Analyseinstitut.* [Online]
Available at: http://www.idan.dk/nyhedsoversigt/nyheder/2012/a166uefarapport/
[Accessed 17 June 2015].

Lin, C. Y., 2014. Does active management work? Evidence from equity sector funds. *Financial Services Review,* Issue 23, pp. 249-271.

Lund, D., 2014. *Increasing Customer Loyalty in the Danish Sports Betting Market,* Copenhagen: Copenhagen Business School.

Lund, D., 2015. *Current state of Danske Spil* [Interview] (23 April 2015).

Malkiel, B. G., 1973. *A Random Walk Down Wall Street.* 1. ed. s.l.:W. W. Norton & Company, Inc..

Malkiel, B. G., 2013. Asset Management Fees and the Growth. *Journal of Economic Perspectives,* pp. 97-108.

Marketline, 2014. *Global Online Gambling,* s.l.: informa.

Marketline, 2014. *Global Sports Equipment,* s.l.: informa.

Markowitz, H., 1952. Portfolio selection. *Journal of Finance,* Issue 7, pp. 77-91.

Markowitz, H., 1959. *Portfolio selection: Efficient Diversification of Investments.* New York: Wiley.

MCH, 2015. *Om MCH.* [Online]
Available at: http://www.mch.dk/MCH/Om-MCH.aspx
[Accessed 15 June 2015].

Michie, J. & Oughton, C., 2004. *Competitive Balance in Football: Trends and Effects,* University of London: Birkbeck.

Miller, R. M., 2007. MEASURING THE TRUE COST OF ACTIVE MANAGEMENT. *Journal of Investment Management,* pp. 29-49.

Morey, M. R., 2003. *The Kiss of Death: A 5-Star Morningstar Mutual Fund Rating?,* New York, NY: Department of Finance, Pace university.

Morningstar, 2014. *The Morningstar Category Classifications.* [Online]
Available at:
http://corporate.morningstar.com/us/documents/MethodologyDocuments/MethodologyPapers/MorningstarCategory_Classifications.pdf
[Accessed 15 May 2015].

Møldrup, K., 2015. *Sporten: TV2.* [Online]
Available at: http://sporten.tv2.dk/fodbold/2015-02-25-fcm-er-ikke-alene-her-bruger-de-ogsaa-for-mange-penge
[Accessed 10 August 2015].

Nordea Invest, 2015. *Produkter:Nordea Invest.* [Online]
Available at: http://www.nordeainvest.dk/Hjem/Produkter/Alle+produkter/1100392.html
[Accessed 28 April 2015].

O'Shaughnessy, P., 2013. *Combining the best of passive and active investing.* [Online]
Available at: http://www.osam.com/pdf/commentary_mar13.pdf
[Accessed 5 July 2015].

Papaloukas, M., 2012. Sports Betting and European Law. In: P. M. Anderson, ed. *Sports Betting: Law and Policy.* The Hague: Asser, pp. 98-106.

Patra, K., 2015. *NFL.* [Online]
Available at: http://www.nfl.com/news/story/0ap3000000467823/article/super-bowl-xlix-is-mostwatched-show-in-us-history
[Accessed 12 July 2015].

Pietiers, M., Knoben, J. & Pouwels, M., 2012. A Social Network Perspective on Sports management:The Effect of Network Embeddedness on the Commercial Performance of Sport Organizations. *Journal of Sport Management,* Issue 26, pp. 433-444.

Plyakha, Y., Uppal, R. & Vilkov, G., 2012. *Why Does an Equal-Weighted Portfolio Outperform Value- and Price-Weighted Portfolios,* s.l.: EDHEC Business School.

Premier League, 2015. *FAQ: Premier League.* [Online]
Available at: http://www.premierleague.com/content/premierleague/en-gb/contact-us.html
[Accessed 17 June 2015].

PwC, 2011. *Changing the game - Outlook for the global sports market,* s.l.: PricewaterhouseCoopers.

PwC, 2014. *At the gate and beyond - Outlook for the sports market in North America through 2018,* s.l.: PricewaterhouseCoopers.

Quatman, C. & Chelladural, P., 2008. Social Network Theory and Analysis:A Complementary Lens for Inquiry. *Journal of Sport Management,* Issue 22, pp. 338-360.

Rein, I., Kotler, P. & Shields, B., 2007. The Future of sports media. *The Futurist,* Volume 1, pp. 40-44.

Roberts, K., 2010. The potential for new legislation to change the relationship between sports and gambling. *Sportbusiness International,* Issue 159, p. 7.

Rosenthal, F., 1975. *Gambling in Islam.* Leiden: Brill.

Ryan, B., Scapens, R. W. & Theobold, M., 2002. *Research Method and Methodology in Finance and accounting.* s.l.:Academic Press Limited.

SBS Discovery Media, 2015. *Bendtners kult-status.* s.l.:s.n.

Sharpe, W. F., 1966. Mutual Fund Performance. *Journal of Business,* Volume 39.

Sharpe, W. F., 1991. The arithmetic of active management. *The Financial Analysts' Journal,* 47(1), pp. 7-9.

Skat, 2015. *Forskerordningen: Skat.* [Online]
Available at: http://www.skat.dk/skat.aspx?oId=1788671&vId=0
[Accessed 11 July 2015].

Sport Industry Research Centre , 2010. *Economic Value of Sport in England 1985-2008,* Sheffield: Sport England.

SportBusiness International, 2007. Business without borders. *Sportsbusiness International,* Issue 129.

SportBusiness International, 2009. *Sports Business international,* Issue 149.

SportBusiness International, 2013. Die Superliga. *SportBusiness International,* Issue 193, pp. 36-38.

SportBusiness International, 2014. Digital sport rights in US leagues. *Sports Business International,* Issue 200, pp. 16-17.

Statista, 2014. *Nike - Statistics and facts.* [Online]
Available at: http://www.statista.com/topics/1243/nike/
[Accessed July 19 2015].

SuperStats, 2015. *SuperStats: Superligaen i tal.* [Online]
Available at: http://www.superstats.dk/news/seertal
[Accessed 15 June 2015].

Szymanski, S., 2003. The Economic Design of Sporting Contests. *Journal of Economic Litterature,* XLI(December), pp. 1137-1187.

The Economist, 2008. How do you view. *The Economist,* Issue 8591, pp. 109-111.

The Telegraph, 2014. *Telegraph Sport.* [Online]
Available at: http://www.telegraph.co.uk/sport/football/competitions/premier-league/11231076/Average-Premier-League-salary-rockets-to-2.3m-as-clubs-TV-windfall-goes-straight-into-players-pockets.html
[Accessed 10 August 2015].

Toft, D., 2014. *Idrættens Analyseinstitut.* [Online]
Available at: http://www.idan.dk/nyhedsoversigt/nyheder/2014/a536_ny-aftale-skal-forbedre-superligaens-konkurrenceevne/
[Accessed 12 June 2015].

Tongue, S., 2013. *The independent.* [Online]
Available at: http://www.independent.co.uk/sport/football/news-and-comment/roman-abramovichs-10year-chelsea-anniversary-what-did-he-ever-do-for-us-spend-2-billion-in-10-years-at-chelsea-thats-what-8680084.html
[Accessed 10 August 2015].

Troelsen, T., 2008. *Sports League Design*, Bern, Schwitzerland: Copenhagen Business School.

Troelsen, T. & Dejonghe, T., 2006. *The need of competitive balance in European professional soccer: A lesson to be learned from the North American professional leagues.*. Nicosia, Cyprus, 14th EASM Congress (European Association for Sport Mangement).

UEFA, 2015. *Protecting the Game: UEFA.* [Online]
Available at: http://www.uefa.org/protecting-the-game/club-licensing-and-financial-fair-play/
[Accessed 17 June 2015].

Vanguard, 2012. *Enhanced practice management: The case for combining active and passive strategies.* [Online]
Available at: https://personal.vanguard.com/pdf/s295.pdf
[Accessed 6 July 2015].

Washer, K. M. & Johnson, R. R., 2013. An Intuitive examination of Downside Risk. *Journal of Financial Planning*, pp. 56-60.

Wolfe, R., Meenaghan, T. & O'Sulivan, P., 2002. The sports network: insights into the shifting balance of power. *Journal of Business Research*, Issue 55, pp. 611-622.

12.0 Appendices

A – Portfolio Weights

Portfolios	1	2	3	4	5	6	7	8	9	10
Adidas	1,18%	1,56%	5,00%	4,43%	0,00%	0,00%	0,00%	5,00%	3,79%	5,00%
AFC AJAX	1,18%	0,00%	0,18%	0,51%	4,69%	0,00%	3,61%	0,71%	0,66%	0,69%
AIK FOOTBALL	1,18%	0,00%	0,01%	0,10%	0,63%	0,00%	0,00%	0,06%	0,00%	0,00%
Amer Sports Oyj, AMEAS,	1,18%	1,56%	1,58%	1,51%	1,38%	0,00%	1,64%	1,17%	0,50%	0,86%
ANTA Sports products limited	1,18%	1,56%	4,93%	2,67%	0,00%	0,00%	0,00%	1,98%	1,93%	1,81%
ARHUS ELITE	1,18%	0,00%	0,03%	0,21%	0,54%	0,00%	0,00%	0,05%	0,00%	0,00%
AS ROMA	1,18%	0,00%	0,15%	0,47%	2,47%	0,00%	0,00%	0,43%	0,40%	0,65%
BESIKTAS	1,18%	0,00%	0,12%	0,42%	0,06%	0,00%	0,00%	0,75%	0,77%	0,70%
BILLABONG INT. LIMITED	1,18%	1,56%	2,91%	2,05%	0,00%	0,00%	0,00%	1,64%	1,74%	1,64%
Borussia Dortmund	1,18%	0,00%	0,10%	0,37%	0,22%	5,00%	5,00%	0,60%	0,33%	0,45%
Brisbane Broncos	1,18%	0,00%	0,04%	0,23%	1,12%	0,00%	0,74%	0,07%	0,00%	0,16%
Brondby IF B	1,18%	0,00%	0,03%	0,20%	0,14%	5,00%	1,51%	0,00%	0,00%	0,00%
BWIN.PARTY	1,18%	1,56%	2,09%	1,74%	0,00%	0,00%	0,00%	0,32%	0,57%	0,35%
Callaway Golf Company	1,18%	1,56%	0,67%	0,99%	0,00%	0,00%	0,00%	0,31%	0,17%	0,31%
Canlan Ice Sports Corp	1,18%	1,56%	0,03%	0,20%	0,87%	0,00%	1,84%	0,28%	0,29%	0,27%
Canterbury Park holding	1,18%	1,56%	0,04%	0,23%	1,56%	5,00%	2,87%	0,88%	0,91%	0,79%
CBS Corporation	1,18%	1,56%	5,00%	4,07%	0,00%	5,00%	0,43%	5,00%	5,00%	5,00%
Celtic	1,18%	0,00%	0,07%	0,32%	5,00%	0,00%	5,00%	1,61%	1,62%	1,36%
Central Sports Co Ltd	1,18%	1,56%	0,11%	0,41%	5,00%	0,00%	5,00%	1,18%	1,14%	1,15%
China Dongxiang	1,18%	1,56%	4,28%	2,49%	0,00%	0,00%	0,00%	2,71%	2,82%	2,69%
China Sports Ind. Gr. Co Ltd	1,18%	1,56%	1,21%	1,32%	0,70%	0,00%	0,00%	1,12%	1,00%	1,18%
China Sports Int. Lim.	1,18%	1,56%	0,09%	0,36%	0,00%	0,00%	0,00%	0,10%	0,10%	0,13%
Churchill Downs Inc.	1,18%	1,56%	0,59%	0,92%	0,25%	0,00%	0,61%	1,76%	2,00%	1,58%
City Sports & Recreation PCL	1,18%	1,56%	0,03%	0,22%	3,59%	0,00%	3,05%	0,44%	0,41%	0,36%
Columbia Sportswear Co	1,18%	1,56%	2,08%	1,73%	0,00%	0,00%	0,00%	3,41%	4,19%	3,78%
Comcast Corporation	1,18%	1,56%	5,00%	8,17%	2,18%	0,00%	5,00%	5,00%	5,00%	5,00%
Compagnie Des Alpes	1,18%	1,56%	0,64%	0,97%	4,49%	0,00%	0,00%	0,00%	0,00%	0,00%
Daktronics Inc.	1,18%	1,56%	0,38%	0,74%	0,00%	0,00%	0,00%	0,12%	0,00%	0,16%
Deckers Outdoor Corp.	1,18%	1,56%	2,02%	1,71%	0,00%	0,00%	0,00%	1,19%	1,51%	1,18%
Dicks sporting goods Inc	1,18%	1,56%	2,92%	2,06%	0,00%	0,00%	0,00%	1,88%	1,81%	1,75%
Dover Motorsports	1,18%	1,56%	0,04%	0,25%	0,35%	0,00%	0,03%	0,00%	0,00%	0,00%

Dunlop Sports Co Ltd	1,18%	1,56%	0,31%	0,67%	5,00%	0,00%	5,00%	0,96%	1,10%	0,69%
Entercom Communications Corp.	1,18%	1,56%	0,47%	0,82%	0,00%	0,00%	0,00%	0,50%	0,40%	0,58%
ESSENDEN PLC	1,18%	1,56%	0,01%	0,10%	0,00%	5,00%	2,54%	0,00%	0,00%	0,00%
FENERBAHCE SPORTIF HIZMET	1,18%	0,00%	1,58%	1,51%	0,29%	0,00%	0,00%	0,37%	0,25%	0,31%
Finish Line	1,18%	1,56%	0,97%	1,18%	0,00%	0,00%	0,00%	0,77%	0,61%	0,78%
FITBUG HLDGS PLC	1,18%	1,56%	0,00%	0,08%	0,41%	0,00%	0,00%	0,00%	0,00%	0,00%
Foot Locker, Inc.	1,18%	1,56%	2,67%	1,96%	0,00%	5,00%	0,00%	3,85%	4,54%	4,40%
Futebol Clube Do Porto	1,18%	0,00%	0,02%	0,19%	0,58%	0,00%	0,00%	0,00%	0,00%	0,00%
Galatasaray AS	1,18%	0,00%	0,24%	0,60%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Gildan Activewear, Inc.	1,18%	1,56%	3,93%	2,39%	0,00%	0,00%	0,00%	3,40%	3,34%	3,35%
GOALS SOCCER CENTRES	1,18%	1,56%	0,14%	0,44%	2,12%	0,00%	0,00%	0,00%	0,00%	0,00%
GVC HLDGS PLC	1,18%	1,56%	0,10%	0,38%	1,91%	0,00%	2,47%	0,54%	0,47%	0,38%
Head N.V.	1,18%	1,56%	0,06%	0,30%	1,13%	5,00%	5,00%	0,12%	0,06%	0,06%
Hibbett Sport	1,18%	1,56%	0,89%	1,13%	0,35%	0,00%	0,61%	1,05%	0,95%	0,70%
HWA AG	1,18%	1,56%	0,07%	0,32%	3,88%	0,00%	5,00%	0,16%	0,19%	0,20%
Inmobiliaria Sport Francais SA	1,18%	1,56%	0,01%	0,14%	3,78%	0,00%	1,95%	0,34%	0,41%	0,28%
International Speedway Corp.	1,18%	1,56%	0,94%	1,17%	0,12%	0,00%	0,00%	1,80%	1,70%	1,71%
JD SPORTS FASHION PLC	1,18%	1,56%	0,66%	0,98%	2,25%	0,00%	0,00%	0,43%	0,50%	0,55%
Juventus	1,18%	0,00%	0,24%	0,59%	1,26%	0,00%	0,00%	0,03%	0,07%	0,09%
LADBROKES PLC	1,18%	1,56%	2,33%	1,84%	0,00%	0,00%	0,00%	0,80%	0,16%	0,36%
Li Ning	1,18%	1,56%	4,43%	2,53%	0,00%	0,00%	0,00%	2,10%	2,19%	2,00%
Lululemon Athletica	1,18%	1,56%	2,31%	1,83%	0,00%	5,00%	3,46%	0,67%	0,85%	1,13%
Mizuno Corporation	1,18%	1,56%	0,64%	0,96%	2,23%	0,00%	0,00%	0,83%	1,03%	0,77%
Nike, Inc.	1,18%	1,56%	5,00%	6,96%	0,97%	0,00%	0,00%	5,00%	5,00%	5,00%
OL Groupe	1,18%	0,00%	0,15%	0,47%	3,15%	0,00%	0,00%	0,52%	0,27%	0,44%
PADDY POWER	1,18%	1,56%	1,82%	1,62%	4,51%	5,00%	5,00%	2,45%	2,93%	2,71%
Parallel Media Group PLC	1,18%	1,56%	0,00%	0,07%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
PARKEN SPORT & ENTERTAINMENT	1,18%	0,00%	0,16%	0,49%	2,69%	0,00%	0,00%	0,97%	0,54%	0,77%
Puma AG	1,18%	1,56%	5,00%	2,86%	2,60%	0,00%	0,00%	3,78%	2,78%	4,63%
Quiksilver, Inc.	1,18%	1,56%	0,81%	1,08%	0,00%	0,00%	0,00%	0,34%	0,27%	0,37%
Siam Sport Syndicate PCL	1,18%	1,56%	0,03%	0,21%	2,86%	0,00%	3,09%	0,66%	0,35%	0,44%
SILKEBORG	1,18%	0,00%	0,02%	0,17%	0,68%	5,00%	1,18%	0,00%	0,00%	0,00%
Skechers U.S.A., Inc.	1,18%	1,56%	1,55%	1,50%	0,00%	0,00%	0,00%	0,86%	1,07%	0,82%
SKISTAR B	1,18%	1,56%	0,77%	1,05%	1,88%	0,00%	0,00%	0,48%	0,10%	0,15%

SKY PLC	1,18%	1,56%	5,00%	5,09%	2,32%	0,00%	0,00%	5,00%	5,00%	5,00%
Societa Sportiva Lazio SpA	1,18%	0,00%	0,03%	0,21%	0,48%	5,00%	1,69%	0,00%	0,00%	0,00%
Speedway Motorsports, Inc.	1,18%	1,56%	0,76%	1,05%	0,51%	0,00%	0,00%	1,79%	1,83%	1,96%
Sport Lisboa e Benfica	1,18%	0,00%	0,07%	0,31%	0,27%	0,00%	0,00%	0,01%	0,00%	0,00%
Sportech PLC	1,18%	1,56%	0,13%	0,43%	0,85%	5,00%	5,00%	0,31%	0,45%	0,31%
Sporting Clube de Braga	1,18%	0,00%	0,00%	0,03%	0,17%	5,00%	1,87%	0,19%	0,22%	0,20%
Sporting Clube De Portugal	1,18%	0,00%	0,03%	0,22%	0,00%	5,00%	0,20%	0,01%	0,00%	0,00%
Sports Direct International PLC	1,18%	1,56%	1,08%	1,25%	0,00%	5,00%	5,00%	1,45%	1,14%	1,29%
Sports Pouch Beverage Co Inc	1,18%	1,56%	0,00%	0,02%	0,05%	5,00%	0,87%	0,00%	0,00%	0,00%
SPORTSWORLD MEDIA GROUP	1,18%	1,56%	0,01%	0,09%	5,00%	0,00%	0,55%	2,25%	3,71%	3,30%
TANDEM GROUP	1,18%	1,56%	0,01%	0,11%	3,30%	0,00%	0,75%	0,49%	0,55%	0,34%
Town Sports Int. Holdings Inc	1,18%	1,56%	0,09%	0,36%	0,00%	5,00%	1,37%	1,12%	1,17%	1,00%
Under Armour, Inc.	1,18%	1,56%	1,44%	1,44%	0,00%	5,00%	4,61%	2,35%	2,94%	2,32%
Unibet Group, plc	1,18%	1,56%	0,88%	1,13%	0,92%	0,00%	0,00%	0,94%	1,21%	1,13%
Vail Resorts, Inc.	1,18%	1,56%	1,86%	1,64%	0,00%	0,00%	0,00%	1,74%	1,36%	1,54%
WEBIS HOLDINGS PLC	1,18%	1,56%	0,01%	0,10%	0,00%	5,00%	1,45%	0,00%	0,00%	0,00%
WILLIAM HILL PLC	1,18%	1,56%	2,38%	1,86%	0,95%	5,00%	5,00%	2,50%	2,91%	2,63%
World Wrestling Enter., Inc.	1,18%	1,56%	0,52%	0,86%	1,84%	0,00%	0,00%	3,42%	3,79%	3,30%
Yue Yuen Int. Holdings Ltd	1,18%	1,56%	5,00%	3,05%	2,89%	0,00%	0,00%	2,78%	2,94%	3,01%
AALBORG BOLDSPILKLUB	1,18%	0,00%	0,01%	0,11%	0,58%	0,00%	0,00%	0,07%	0,00%	0,00%

B – Beta analysis

COMCAST

Regression Statistics	
Multiple F	0,532168
R Square	0,283203
Adjusted I	0,277128
Standard I	6,115367
Observati	120

t-stat beta	-0,35028		
Significantly different from 1 if higher than 1.96			**NO**

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	1743,527155	1743,52716	46,62122	3,97E-10
Residual	118	4412,930564	37,3977166		
Total	119	6156,45772			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0,537314	0,562093114	0,95591681	0,341069	-0,57578	1,650412
MSCI	0,951202	0,139309596	6,82797331	3,97E-10	0,675331	1,227073

NIKE

Regression Statistics	
Multiple F	0,542663468
R Square	0,294483639
Adjusted I	0,288504687
Standard I	5,563717343
Observati	120

t-stat beta	-0,87191		
Significantly different from 1 if higher than 1.96			**NO**

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	1524,636126	1524,63613	49,25339	1,53E-10
Residual	118	3652,684179	30,9549507		
Total	119	5177,320305			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1,073272022	0,51138829	2,09874188	0,037972	0,060584	2,08596
MSCI	0,88949107	0,126742873	7,01807564	1,53E-10	0,638506	1,140476

Footlocker

Regression Statistics	
Multiple F	0,51233
R Square	0,262482
Adjusted I	0,256232
Standard I	9,069712
Observati	120

t-stat beta	1,640415		
Significantly different from 1 if higher than 1.96			**NO**

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	3454,59072	3454,59072	41,99616	2,21E-09
Residual	118	9706,64268	82,2596837		
Total	119	13161,2334			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0,576612	0,833641332	0,69167816	0,490498	-1,07423	2,227448
MSCI	1,338927	0,206610318	6,48044432	2,21E-09	0,929782	1,748071

Dicks Sporting goods

Regression Statistics	
Multiple F	0,566891489
R Square	0,321365961
Adjusted I	0,315614825
Standard I	9,009266184
Observati	120

t-stat beta	2,602702		
Significantly different from 1 if higher than 1.96			**YES** **Higher**

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	4535,499037	4535,49904	55,87869	1,48E-11
Residual	118	9577,691506	81,1668772		
Total	119	14113,19054			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0,833356897	0,828085423	1,00636586	0,316299	-0,80648	2,473191
MSCI	1,534161319	0,205233337	7,47520524	1,48E-11	1,127743	1,940579

Puma

Regression Statistics	
Multiple F	0,553662
R Square	0,306541
Adjusted I	0,300665
Standard I	7,065792
Observati	120

t-stat beta	1,009592		
Significantly different from 1 if higher than 1.96			**NO**

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	2604,187859	2604,18786	52,16157	5,42E-11
Residual	118	5891,19855	49,9254114		
Total	119	8495,386409			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-0,32238	0,649451236	-0,4963889	0,620543	-1,60847	0,96371
MSCI	1,162505	0,160960501	7,22229675	5,42E-11	0,843759	1,48125

Adidas

Regression Statistics	
Multiple F	0,647196976
R Square	0,418863926
Adjusted I	0,413939044
Standard I	5,719028781
Observati	120

t-stat beta	1,546564		
Significantly different from 1 if higher than 1.96			**NO**

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	2781,773055	2781,77305	85,05055	1,39E-15
Residual	118	3859,460243	32,7072902		
Total	119	6641,233298			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0,293934527	0,525663719	0,55916837	0,577107	-0,74702	1,334892
MSCI	1,201487722	0,130280906	9,22228557	1,39E-15	0,943496	1,459479

SKY

Regression Statistics	
Multiple R	0,318768
R Square	0,101613
Adjusted R	0,094
Standard E	5,608875
Observati	120

t-stat beta	-4,17318	
Significantly different from 1		**YES**
if higher than 1.96		**Lower**

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	419,8747477	419,874748	13,34653	0,000388
Residual	118	3712,218331	31,4594774		
Total	119	4132,093079			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0,418685	0,515538939	0,81213094	0,418352	-0,60222	1,439593
MSCI	0,466787	0,127771573	3,65328981	0,000388	0,213764	0,719809

Paddy Power

Regression Statistics	
Multiple R	0,192229052
R Square	0,036952009
Adjusted R	0,028790585
Standard E	8,019494319
Observati	120

t-stat beta	-3,34604	
Significantly different from 1		**YES**
if higher than 1.96		**Lower**

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	291,1830532	291,183053	4,527642	0,035432
Residual	118	7588,850117	64,3122891		
Total	119	7880,03317			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1,5233576	0,737110683	2,06666059	0,040954	0,063678	2,983037
MSCI	0,388724163	0,182686087	2,12782577	0,035432	0,026956	0,750492

Lululemon

Regression Statistics	
Multiple R	0,581452
R Square	0,338087
Adjusted R	0,330732
Standard E	15,54275
Observati	92

t-stat beta	4,146847	
Significantly different from 1		**Yes**
if higher than 1.96		**Higher**

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	11105,17564	11105,1756	45,96952	1,22E-09
Residual	90	21741,92559	241,576951		
Total	91	32847,10124			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	2,020485	1,628166628	1,24095704	0,217847	-1,21415	5,255122
MSCI	2,57481	0,379760933	6,78008234	1,22E-09	1,820349	3,329272

Under Armour

Regression Statistics	
Multiple R	0,445690432
R Square	0,198639962
Adjusted R	0,19135487
Standard E	10,79638711
Observati	112

t-stat beta	1,283357	
Significantly different from 1		**NO**
if higher than 1.96		

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	3178,253412	3178,25341	27,26664	8,46E-07
Residual	110	12821,81721	116,561975		
Total	111	16000,07062			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	2,069550088	1,02382269	2,02139502	0,045667	0,040574	4,098526
MSCI	1,325858342	0,253910881	5,22174684	8,46E-07	0,822667	1,82905

CBS

Regression Statistics	
Multiple R	0,639520704
R Square	0,40898673
Adjusted R	0,403978143
Standard E	10,58779353
Observati	120

t-stat beta	4,890368	
Significantly different from 1		**YES**
if higher than 1.96		**Higher**

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	9153,87378	9153,87378	81,65711	3,79E-15
Residual	118	13227,96187	112,101372		
Total	119	22381,83565			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0,398878876	0,97317554	0,40987351	0,682642	-1,52827	2,326031
MSCI	2,179520454	0,241192585	9,03643224	3,79E-15	1,701893	2,657147

William Hill

Regression Statistics	
Multiple R	0,470703
R Square	0,221562
Adjusted R	0,214965
Standard E	7,243557
Observati	120

t-stat beta	-0,26493	
Significantly different from 1		**NO**
if higher than 1.96		

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	1762,204	1762,204	33,58555	5,79E-08
Residual	118	6191,356	52,46912		
Total	119	7953,561			

	Coefficients	*Standard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-0,27453	0,665791	-0,41234	0,680841	-1,59298	1,043917
MSCI	0,956283	0,16501	5,795304	5,79E-08	0,629519	1,283048

Gildan

Regression Statistics	
Multiple F	0,504334577
R Square	0,254353366
Adjusted I	0,248034326
Standard I	10,99608362
Observati	120

t-stat beta	2,35232			
Significantly different from 1				**YES**
if higher than 1.96				**Higher**

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	4867,012955	4867,01295	40,2519	4,28E-09
Residual	118	14267,8349	120,913855		
Total	119	19134,84785			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1,574681597	1,010703467	1,55800554	0,12191	-0,42679	3,57615
MSCI	1,589240925	0,250493536	6,34443887	4,28E-09	1,093196	2,085286

Sports Direct

Regression Statistics	
Multiple F	0,395949
R Square	0,156776
Adjusted I	0,1479
Standard E	11,08978
Observati	97

t-stat beta	0,460149			
Significantly different from 1				**NO**
if higher than 1.96				

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	2172,225	2172,225	17,66278	5,96E-05
Residual	95	11683,41	122,9832		
Total	96	13855,63			

	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0,991828	1,130761	0,877133	0,382627	-1,25302	3,236671
MSCI	1,12295	0,267197	4,20271	5,96E-05	0,592498	1,653403

Yue Yuen

Regression Statistics	
Multiple F	0,388760386
R Square	0,151134637
Adjusted I	0,143940863
Standard I	7,248372792
Observati	120

t-stat beta	-1,47264			
Significantly different from 1				**NO**
if higher than 1.96				

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	1103,794551	1103,79455	21,00909	1,14E-05
Residual	118	6199,59116	52,5389081		
Total	119	7303,385711			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0,082353896	0,666233157	0,12361122	0,901833	-1,23697	1,401677
MSCI	0,756837447	0,165119746	4,58356718	1,14E-05	0,429855	1,083819

C – Complete overview of benchmarks and portfolios

Name	Danske Invest Bioteknologi	Danske Invest KlimaTrends	Danske Invest Teknologi	Jyske Invest Favorit Aktier - Global	Jyske Invest Europæiske Aktier	Nordea Invest Danske Aktier Fokus
Mornigstar rating	4	4	5	5	4	5
Return	150,93%	15,93%	131,23%	102,81%	85,80%	107,30%
Return p.a.	20,20%	3,00%	18,25%	15,19%	13,19%	15,70%
Standard Deviation	1,67%	1,12%	1,23%	1,05%	1,21%	1,28%
Sharpe Ratio	12,06	2,67	14,83	14,49	10,89	12,31
Return 10-13	45,37%	-6,95%	25,40%	33,90%	27,51%	36,73%
Return p.a.	13,28%	-2,37%	7,84%	10,22%	8,44%	10,99%
Standard Deviation	1,51%	1,17%	1,28%	1,12%	1,34%	1,23%
Sharpe Ratio	8,81	-2,02	6,11	9,13	6,29	8,94
Return 13-15	71,81%	23,80%	83,23%	51,31%	46,22%	52,42%
Return p.a.	31,08%	11,27%	35,36%	23,01%	20,92%	23,46%
Standard Deviation	1,89%	1,05%	1,15%	0,93%	0,98%	1,34%
Sharpe Ratio	16,42	10,75	30,83	24,70	21,24	17,52

Name	SIF - equal weights	SIF - no sport teams equal weights	SIF - Market weights	SIF - Squared Market Weights	Min-Var	Max-Ret	Max-SR	BL-1	BL-2	BL-3
Mornigstar rating	-	-	-	-	-	-	-	-	-	-
Return	74,24%	100,68%	111,89%	120,03%	60,82%	183,86%	173,85%	137,43%	146,06%	138,64%
Return p.a.	11,75%	14,95%	16,20%	17,08%	9,97%	23,20%	22,32%	18,88%	19,73%	19,00%
Standard Deviation	1,32%	0,88%	0,90%	0,87%	0,48%	4,78%	0,72%	0,82%	0,82%	0,82%
Sharpe Ratio	8,92	17,01	17,97	19,59	20,97	4,85	31,12	22,99	23,92	23,04
Return 10-13	20,70%	34,31%	34,96%	40,53%	20,44%	109,62%	105,37%	48,71%	49,83%	49,04%
Return p.a.	6,47%	10,33%	10,51%	12,01%	6,39%	27,98%	27,11%	14,14%	14,43%	14,23%
Standard Deviation	1,61%	0,96%	1,00%	0,97%	0,48%	6,08%	0,77%	0,90%	0,90%	0,90%
Sharpe Ratio	4,02	10,74	10,55	12,37	13,45	4,61	35,26	15,74	16,02	15,76
Return 13-15	44,36%	49,42%	57,00%	56,57%	33,53%	35,42%	33,35%	59,65%	64,22%	60,12%
Return p.a.	20,15%	22,24%	25,30%	25,13%	15,55%	16,37%	15,48%	26,35%	28,15%	26,54%
Standard Deviation	0,67%	0,74%	0,74%	0,70%	0,47%	1,33%	0,63%	0,69%	0,69%	0,69%
Sharpe Ratio	30,00	30,19	34,35	35,96	32,83	12,35	24,61	38,25	40,51	38,43

D – Individual asset risk and return overview

Name	Adidas	AFC AJAX	AIK FOOTBALL	Amer Sports Oyj, AMEAS,	ANTA Sports products limited	ARHUS ELITE	AS ROMA	BESIKTAS
Code	D:ADS(P)~DK	H:AFC(P)~DK	W:AIK(P)~DK	M:AMA(P)~DK	K:ANIT(P)~DK	DK:ELB(P)~DK	I:ASR(P)~DK	TK:BJK(P)~DK
Return	62,31%	40,01%	-63,01%	148,32%	42,88%	-80,53%	9,16%	-2,26%
Return p.a.	10,17%	6,96%	-18,04%	19,95%	7,40%	-27,91%	1,77%	-0,46%
Average return	0,05%	0,05%	0,02%	0,09%	0,07%	-0,04%	0,07%	0,05%
st dev	1,63%	2,14%	4,33%	1,83%	2,79%	4,09%	3,56%	3,36%
2010-13 ret	76,27%	8,82%	-61,37%	43,17%	-53,86%	-78,32%	-41,79%	-16,70%
2010-13 p.a. ret	20,80%	2,86%	-27,17%	12,71%	-22,73%	-39,92%	-16,50%	-5,91%
2010-13 Ave. ret	0,09%	0,03%	-0,05%	0,07%	-0,06%	-0,13%	-0,03%	0,04%
2010-13 st dev	1,67%	2,11%	3,71%	2,07%	2,92%	3,71%	2,74%	3,50%
2013-15 ret	-7,92%	28,66%	-4,26%	73,44%	209,65%	-10,20%	87,53%	17,33%
2013-15 p.a. ret	-4,04%	13,43%	-2,15%	31,70%	75,97%	-5,24%	36,94%	8,32%
2013-15 Ave. ret	0,00%	0,07%	0,12%	0,12%	0,25%	0,09%	0,22%	0,08%
2013-15 st dev	1,56%	2,18%	5,12%	1,40%	2,55%	4,59%	4,50%	3,15%

Name	BILLABONG INTERNATIONAL LIMITED	Borussia Dortmund	Brisbane Broncos	Brondby IF B	BWIN.PARTY DIGITAL ENTERTAINMENT	Callaway Golf Company	Canlan Ice Sports Corp	Canterbury Park holding
Code	A:BBGX(P)~DK	D:BVB(P)~DK	A:BBLX(P)~DK	DK:BIF(P)~DK	BPTY(P)~DK	U:ELY(P)~DK	C:ICE(P)~DK	@CPHC(P)~DK
Return	-92,08%	220,10%	-22,35%	-70,87%	-68,16%	18,37%	71,81%	50,24%
Return p.a.	-39,78%	26,20%	-4,93%	-21,86%	-20,46%	3,43%	11,43%	8,48%
Average return	-0,08%	0,12%	0,03%	0,07%	-0,04%	0,04%	0,09%	0,08%
st dev	4,59%	2,48%	3,04%	6,10%	2,99%	2,28%	3,24%	3,23%
2010-13 ret	-94,18%	203,57%	-7,18%	29,13%	-55,21%	-31,98%	40,93%	46,87%
2010-13 p.a. ret	-61,25%	44,80%	-2,45%	8,89%	-23,49%	-12,06%	12,12%	13,67%
2010-13 Ave. ret	-0,27%	0,18%	0,04%	0,26%	-0,05%	-0,02%	0,11%	0,12%
2010-13 st dev	4,16%	2,84%	3,13%	7,28%	3,26%	2,41%	3,64%	3,67%
2013-15 ret	36,16%	5,44%	-16,34%	-77,44%	-28,92%	74,03%	21,91%	2,29%
2013-15 p.a. ret	16,69%	2,69%	-8,53%	-52,51%	-15,69%	31,92%	10,41%	1,14%
2013-15 Ave. ret	0,19%	0,03%	0,01%	-0,21%	-0,03%	0,12%	0,07%	0,03%
2013-15 st dev	5,15%	1,83%	2,91%	3,67%	2,54%	2,08%	2,52%	2,43%

Name	CBS Corporation	Celtic	Central Sports Co Ltd	China Dongxiang "Kappa"	China Sports Industry Group Co Ltd	China Sports International Limited	Churchill Downs Inc.	City Sports & Recreation PCL
Code	U:CBS(P)~DK	CCP(P)~DK	J:CSPT(P)~DK	K:CHDN(P)~DK	CN:CPI(P)~DK	T:CSIL(P)~DK	@CHDN(P)~DK	Q:CSRT(P)~DK
Return	341,35%	93,00%	136,46%	-58,41%	277,93%	-80,22%	259,16%	40,81%
Return p.a.	34,57%	14,05%	18,78%	-16,09%	30,46%	-27,68%	29,14%	7,08%
Average return	0,13%	0,06%	0,07%	-0,03%	0,15%	-0,03%	0,11%	0,04%
st dev	1,87%	1,07%	1,26%	2,75%	3,14%	4,51%	1,60%	1,83%
2010-13 ret	177,79%	30,00%	74,15%	-75,29%	-36,74%	-59,53%	91,80%	17,18%
2010-13 p.a. ret	40,57%	9,14%	20,31%	-37,25%	-14,16%	-26,03%	24,25%	5,43%
2010-13 Ave. ret	0,15%	0,04%	0,08%	-0,13%	-0,02%	-0,04%	0,10%	0,04%
2010-13 st dev	2,10%	1,26%	1,39%	3,14%	2,74%	4,03%	1,82%	1,95%
2013-15 ret	58,88%	48,46%	35,78%	68,32%	497,45%	-51,11%	87,26%	20,16%
2013-15 p.a. ret	26,05%	21,84%	16,53%	29,74%	144,43%	-30,08%	36,84%	9,62%
2013-15 Ave. ret	0,10%	0,08%	0,06%	0,12%	0,41%	-0,02%	0,12%	0,05%
2013-15 st dev	1,48%	0,69%	1,03%	2,02%	3,64%	5,14%	1,18%	1,63%

Name	Columbia Sportswear Company	Comcast Corporation	Compagnie Des Alpes	Daktronics Inc.	Deckers Outdoor Corporation	Dicks sporting goods Inc	Dover Motorsports, Inc.	Dunlop Sports Co Ltd
Code	@COLM(P)~DK	@CMCSA(P)~DK	F:CDA(P)~DK	@DAKT(P)~DK	U:DECK(P)~DK	U:DKS(P)~DK	U:DVD(P)~DK	J:SRIS(P)~DK
Return	142,82%	237,33%	-25,92%	47,88%	84,71%	119,03%	28,86%	23,13%
Return p.a.	19,41%	27,53%	-5,82%	8,14%	13,06%	16,98%	5,20%	4,25%
Average return	0,08%	0,10%	-0,01%	0,06%	0,09%	0,08%	0,07%	0,02%
st dev	1,78%	1,39%	1,28%	2,60%	2,93%	1,89%	3,31%	1,19%
2010-13 ret	2,97%	105,38%	-34,00%	12,55%	12,85%	60,93%	-1,85%	23,85%
2010-13 p.a. ret	0,98%	27,11%	-12,94%	4,02%	4,11%	17,19%	-0,62%	7,39%
2010-13 Ave. ret	0,02%	0,10%	-0,04%	0,06%	0,07%	0,08%	0,07%	0,04%
2010-13 st dev	1,81%	1,46%	1,45%	2,82%	3,23%	1,99%	3,72%	1,29%
2013-15 ret	135,82%	64,24%	12,25%	31,40%	63,68%	36,10%	31,29%	-0,58%
2013-15 p.a. ret	53,56%	28,16%	5,95%	14,63%	27,94%	16,66%	14,58%	-0,29%
2013-15 Ave. ret	0,18%	0,11%	0,03%	0,07%	0,12%	0,07%	0,08%	0,00%
2013-15 st dev	1,74%	1,28%	0,95%	2,22%	2,41%	1,74%	2,57%	1,03%

Name	Entercom Communications	ESSENDEN PLC	FENERBAHCE SPORTIF HIZMET	Finish Line	FITBUG HLDGS PLC	Foot Locker, Inc.	Futebol Clube Do Porto	Galatasaray Sportif Sinai ve Ticari
Code	U:ETM(P)~DK	ESS(P)~DK	TK:FNR(P)~DK	@FINL(P)~DK	FITB(P)~DK	U:FL(P)~DK	P:FCP(P)~DK	TK:GSR(P)~DK
Return	-1,25%	384,12%	-69,16%	72,62%	6,45%	354,14%	-48,49%	-75,72%
Return p.a.	-0,25%	37,09%	-20,96%	11,54%	1,26%	35,34%	-12,43%	-24,65%
Average return	0,05%	0,18%	-0,04%	0,07%	0,38%	0,13%	0,07%	-0,07%
st dev	3,06%	3,33%	3,17%	2,24%	10,69%	1,89%	4,89%	2,89%
2010-13 ret	-47,15%	62,94%	-61,03%	11,49%	-85,48%	121,84%	-70,22%	-35,52%
2010-13 p.a. ret	-19,15%	17,67%	-26,96%	3,69%	-47,44%	30,42%	-33,22%	-13,61%
2010-13 Ave. ret	-0,02%	0,13%	-0,06%	0,05%	-0,05%	0,12%	-0,05%	0,00%
2010-13 st dev	3,53%	3,65%	3,42%	2,41%	6,18%	2,10%	4,67%	3,24%
2013-15 ret	86,86%	197,11%	-20,86%	54,84%	633,33%	104,71%	72,95%	-62,34%
2013-15 p.a. ret	36,70%	72,37%	-11,04%	24,43%	170,80%	43,08%	31,51%	-38,63%
2013-15 Ave. ret	0,14%	0,24%	-0,01%	0,10%	1,02%	0,15%	0,24%	-0,16%
2013-15 st dev	2,18%	2,79%	2,74%	1,95%	15,08%	1,53%	5,18%	2,28%

Name	Gildan Activewear, Inc.	GOALS SOCCER CENTRES	GVC HLDGS PLC	Head N.V.	Hibbett Sport	HWA AG	Inmobiliaria Sport Francais SA	International Speedway Corporation
Code	C:GIL(P)~DK	GOAL(P)~DK	GVC(P)~DK	O:HEAD(P)~DK	@HIBB(P)~DK	D:H9W(P)~DK	CL:SPF(P)~DK	@ISCA(P)~DK
Return	149,98%	48,44%	170,66%	118,82%	96,47%	55,89%	108,29%	39,15%
Return p.a.	20,11%	8,22%	22,04%	16,95%	14,46%	9,29%	15,81%	6,83%
Average return	0,09%	0,05%	0,10%	0,16%	0,07%	0,05%	0,07%	0,04%
st dev	1,91%	1,76%	2,05%	4,92%	1,91%	1,98%	1,69%	1,65%
2010-13 ret	36,66%	-17,92%	51,45%	260,75%	92,00%	52,95%	37,78%	3,88%
2010-13 p.a. ret	10,97%	-6,37%	14,84%	53,37%	24,29%	15,22%	11,28%	1,28%
2010-13 Ave. ret	0,07%	0,00%	0,08%	0,25%	0,11%	0,08%	0,05%	0,02%
2010-13 st dev	2,22%	2,12%	2,41%	4,23%	2,05%	2,16%	1,74%	1,80%
2013-15 ret	82,93%	80,86%	78,72%	-39,34%	2,33%	1,92%	51,17%	33,96%
2013-15 p.a. ret	35,25%	34,48%	33,69%	-22,12%	1,16%	0,96%	22,95%	15,74%
2013-15 Ave. ret	0,13%	0,12%	0,12%	0,02%	0,02%	0,02%	0,09%	0,06%
2013-15 st dev	1,33%	1,00%	1,34%	5,79%	1,68%	1,69%	1,60%	1,39%

Name	JD SPORTS FASHION PLC	Juventus	LADBROKES PLC	Li Ning	Lululemon Athletica	Mizuno Corporation	Nike, Inc.	OL Groupe
Code	JD.(P)~DK	I:JUVE(P)~DK	LAD(P)~DK	K:LNIN(P)~DK	@LULU(P)~DK	J:MIZN(P)~DK	U:NKE(P)~DK	F:OLG(P)~DK
Return	226,73%	-12,30%	-23,27%	-79,80%	260,32%	35,58%	205,19%	-9,74%
Return p.a.	26,72%	-2,59%	-5,16%	-27,37%	29,22%	6,28%	25,00%	-2,03%
Average return	0,12%	0,03%	0,00%	-0,07%	0,13%	0,04%	0,10%	0,02%
st dev	2,30%	2,77%	1,82%	3,17%	2,69%	1,76%	1,51%	2,25%
2010-13 ret	6,12%	-38,06%	24,31%	-84,51%	263,28%	-4,47%	63,01%	-74,58%
2010-13 p.a. ret	2,00%	-14,76%	7,52%	-46,29%	53,73%	-1,51%	17,69%	-36,65%
2010-13 Ave. ret	0,04%	-0,02%	0,04%	-0,19%	0,21%	0,01%	0,08%	-0,15%
2010-13 st dev	2,48%	3,00%	1,71%	3,21%	2,85%	1,60%	1,62%	2,03%
2013-15 ret	207,90%	41,58%	-38,27%	30,43%	-0,81%	41,93%	87,22%	255,08%
2013-15 p.a. ret	75,47%	18,99%	-21,43%	14,21%	-0,41%	19,13%	36,83%	88,44%
2013-15 Ave. ret	0,23%	0,09%	-0,07%	0,10%	0,03%	0,08%	0,13%	0,27%
2013-15 st dev	2,00%	2,38%	1,96%	3,09%	2,42%	1,96%	1,32%	2,53%

Name	PADDY POWER	Parallel Media Group PLC	PARKEN SPORT & ENTERTAINM	Puma AG	Quiksilver, Inc.	Siam Sport Syndicate PCL	SILKEBORG	Skechers U.S.A., Inc.
Code	PAP(P)~DK	PAA(P)~DK	DK:PSE(P)~DK	D:PUM(P)~DK	U:ZQK(P)~DK	Q:SISS(P)~DK	DK:SIF(P)~DK	U:SKX(P)~DK
Return	201,25%	-98,94%	-32,16%	-30,65%	-67,09%	-30,51%	-38,10%	171,84%
Return p.a.	24,68%	-59,75%	-7,47%	-7,06%	-19,93%	-7,02%	-9,15%	22,14%
Average return	0,10%	-0,24%	-0,01%	-0,02%	0,00%	-0,01%	0,13%	0,11%
st dev	1,47%	4,78%	1,99%	1,58%	4,03%	2,12%	5,81%	2,75%
2010-13 ret	143,31%	-90,13%	0,58%	-9,97%	13,24%	27,12%	-51,90%	-47,15%
2010-13 p.a. ret	34,50%	-53,79%	0,19%	-3,44%	4,23%	8,33%	-21,65%	-19,15%
2010-13 Ave. ret	0,12%	-0,16%	0,03%	0,00%	0,09%	0,05%	0,11%	-0,04%
2010-13 st dev	1,41%	5,31%	2,25%	1,68%	3,67%	2,09%	6,13%	2,98%
2013-15 ret	23,81%	-89,29%	-32,56%	-22,97%	-70,93%	-45,33%	28,71%	414,31%
2013-15 p.a. ret	11,27%	-67,28%	-17,88%	-12,23%	-46,09%	-26,06%	13,45%	126,78%
2013-15 Ave. ret	0,05%	-0,35%	-0,06%	-0,04%	-0,14%	-0,09%	0,16%	0,34%
2013-15 st dev	1,55%	3,83%	1,53%	1,42%	4,50%	2,16%	5,30%	2,33%

Name	SKISTAR B	SKY PLC	Societa Sportiva Lazio SpA	Speedway Motorsports, Inc.	Sport Lisboa e Benfica-Futebol SAD	Sportech PLC	Sporting Clube de Braga	Sporting Clube De Portugal -
Code	W:SKIS(P)~DK	SKY(P)~DK	I:SSL(P)~DK	U:TRK(P)~DK	P:SLB(P)~DK	SPO(P)~DK	P:SCB(P)~DK	D:SCG(P)~DK
Return	-24,81%	105,94%	159,21%	59,32%	-53,56%	61,34%	54,82%	-57,50%
Return p.a.	-5,54%	15,54%	20,98%	9,76%	-14,22%	10,04%	9,14%	-15,73%
Average return	-0,01%	0,07%	0,15%	0,05%	0,08%	0,06%	0,32%	4,15%
st dev	1,63%	1,40%	3,96%	1,78%	5,31%	2,02%	7,46%	89,19%
2010-13 ret	-37,86%	40,38%	31,61%	5,83%	-70,04%	102,86%	11,07%	-69,74%
2010-13 p.a. ret	-14,66%	11,97%	9,59%	1,91%	-33,09%	26,59%	3,56%	-32,86%
2010-13 Ave. ret	-0,05%	0,05%	0,13%	0,03%	-0,02%	0,11%	0,38%	6,77%
2010-13 st dev	1,77%	1,42%	4,31%	1,97%	5,24%	1,96%	8,11%	115,06%
2013-15 ret	20,99%	46,70%	96,95%	50,55%	55,03%	-20,47%	39,39%	40,42%
2013-15 p.a. ret	9,99%	21,12%	40,34%	22,70%	24,51%	-10,82%	18,06%	18,50%
2013-15 Ave. ret	0,05%	0,08%	0,18%	0,08%	0,23%	-0,02%	0,23%	0,26%
2013-15 st dev	1,40%	1,37%	3,38%	1,47%	5,42%	2,11%	6,38%	6,19%

Name	Sports Direct International PLC	Sports Pouch Beverage Co Inc	SPORTSWORLD MEDIA GROUP	TANDEM GROUP	Town Sports International Holdings Inc	Under Armour, Inc.	Unibet Group, plc
Code	SPD(P)~DK	@SPBV(P)~DK	SWD(P)~DK	TND(P)~DK	@CLUB(P)~DK	U:UA(P)~DK	W:UNIB(P)~DK
Return	547,73%	-39,94%	17,78%	74,77%	98,61%	963,14%	166,31%
Return p.a.	45,30%	-9,69%	3,33%	11,81%	14,71%	60,44%	21,64%
Average return	0,16%	1,90%	0,02%	0,07%	0,10%	0,21%	0,09%
st dev	2,06%	26,81%	0,86%	2,29%	3,07%	2,42%	1,62%
2010-13 ret	325,10%	-82,88%	2,22%	0,12%	168,50%	226,48%	21,43%
2010-13 p.a. ret	61,99%	-44,48%	0,74%	0,04%	38,99%	48,35%	6,69%
2010-13 Ave. ret	0,21%	2,27%	0,01%	0,02%	0,18%	0,19%	0,04%
2010-13 st dev	2,17%	30,83%	0,92%	1,91%	3,20%	2,54%	1,78%
2013-15 ret	52,37%	250,88%	15,22%	74,56%	-26,03%	225,64%	119,31%
2013-15 p.a. ret	23,44%	87,32%	7,34%	32,12%	-13,99%	80,45%	48,09%
2013-15 Ave. ret	0,10%	1,34%	0,03%	0,14%	-0,02%	0,25%	0,16%
2013-15 st dev	1,89%	19,30%	0,76%	2,77%	2,86%	2,23%	1,33%

Name	Vail Resorts, Inc.	WEBIS HOLDINGS PLC	WILLIAM HILL PLC	World Wrestling Entertainment	Yue Yuen International Holdings Ltd	AALBORG BOLDSPILKLUB
Code	U:MTN(P)~DK	WEB(P)~DK	WMH(P)~DK	U:WWE(P)~DK	K:YUEN(P)~DK	DK:AAB(P)~DK
Return	149,85%	-56,25%	124,68%	-13,60%	25,38%	-73,39%
Return p.a.	20,10%	-15,24%	17,57%	-2,88%	4,63%	-23,26%
Average return	0,09%	0,08%	0,07%	0,02%	0,03%	0,16%
st dev	1,94%	5,53%	1,60%	2,57%	1,84%	9,01%
2010-13 ret	26,62%	93,75%	127,99%	-51,07%	-3,16%	-74,31%
2010-13 p.a. ret	8,18%	24,67%	31,61%	-21,20%	-1,07%	-36,43%
2010-13 Ave. ret	0,06%	0,24%	0,12%	-0,07%	0,01%	-0,03%
2010-13 st dev	2,21%	5,87%	1,61%	1,82%	1,85%	5,25%
2013-15 ret	97,32%	-77,42%	-1,45%	76,56%	29,48%	3,57%
2013-15 p.a. ret	40,47%	-52,48%	-0,73%	32,88%	13,79%	1,77%
2013-15 Ave. ret	0,14%	-0,15%	0,01%	0,17%	0,07%	0,45%
2013-15 st dev	1,45%	4,96%	1,59%	3,38%	1,83%	12,69%

E – Interview with Olav Skaaning Andersen

Interviewer: Joachim Dissing Andersen

Date: 21st of May 2015

Name: Olav Skaaning Andersen

Profession: Editor in Chief at B.T.

Former: Chief of DR Sporten and Editor of EkstraBladet's Sport section

JDA: Hvordan differentierer B.T. sig i forhold til sine konkurrenter? (områder dækket og hvad fortæller det om avisens læsere)

OSA: B.T. har fire kerneområder, det er nyheder, sport, sundhed og underholdning. Det er de 4 punkter vi koncentrerer os om. Nyheder er et vidt begreb, men vi koncentrerer os om nyheder der har noget at gøre med folks dagligdag, det er politik, kriminalitet og samfund.
Så er der sundhed, som er noget vi på B.T. har opdyrket, og som er meget særligt for B.T., men andre har gjort noget tilsvarende, og det er Politiken, det er Ekstra Bladet. Sundhed er det man gør for at forbedre sit eget liv, hvad enten det handler om motion eller sygdomme.
Og så er der sport som er en meget meget vigtigt del af B.T.'s DNA. Sport er efter nyheder det vigtigste. Vi har en undersøgelse der viser at 40% af vores læsere køber avisen pga. sport. Vi er også førende set på sportsdækningen i Danmark, set fra vores eget synspunkt. Det er os der har flest sider hver dag. Vi har 20 sider hver dag hvor vores konkurrent Ekstra Bladet har 12 og hvis det går højt 16. Så kan man sige, betyder kvantitet noget, og ja det gør det faktisk, at folk kan få en bred sportsdækning hos os, det har vi undersøgt og det gør den. Kvaliteten betyder også noget, selvfølgelig gør den, men de ting følges som regel ad. Nu har vi en stor sportssektion her på 25 mand, hvilket er den største på nogen avis i Danmark. Så det betyder rigtig meget for os, og det kan man se gennem at en fjerdedel af vores medarbejdere er ansat i relation til sport. Nu taler jeg hovedsagligt om print hvor vi er stærke, vi er sølvfølgelig også på digitale og sociale medier med vores sportsdækning. Så på et bredt spektrum betyder sport rigtig meget.

JDA: Nu siger du at 25 % af jeres medarbejdere er ansat på sporten, men hvis 40 % af jeres læsere køber avisen pga. sporten så er det vel en god investering på den led?

OSA: Sport er noget der deler, der er virkelig nogen der interesserer sig for sport og så er der nogen der slet ikke gør og ikke kan holde det ud. Vi kunne ikke overleve kun som en sportsavis, men sport betyder meget for os, da der er mange der køber avisen pga. det. Men der er også mange der bare

tager sportssektionen ud og lægger den væk og egentlig bare gerne vil læse B.T.
Sport er meget til mænd, resten af B.T. er måske mere til kvinder, og på den måde prøver vi at favne det hele. Så det er vigtigt med meget sport, men det er også vigtigt med rigtig meget andet stof der appellerer til andre der ikke er sportsinteresserede. For havde vi kun sporten så ville vi miste i hvert fald 60 % og derved hele vores overskud. Og det samme den anden vej rundt, hvis vi ikke havde sporten ville vi også miste rigtig rigtig meget. Så de supplerer hinanden.

JDA: Er der perioder hvor i kan mærke at oplaget stiger? (tænker i forbindelse med større sportsevents)

OSA: Det har der været, og nu taler vi om print. Før i tiden kunne man se det hvis der havde været en fodboldlandskamp og Danmark havde vundet, for det handler om at vinde. Der er ikke noget salg i at tabe, folk vil have vindere og læse om succes. Man kan ikke iagttage den samme stigning i oplag i forbindelse med sportssucceshistorier som man kunne for 10-15 år siden. Det har ikke så afgørende betydning mere og derfor har vi også sjældnere og sjældnere sport på forsiden. Det er ikke i sig selv salgsudløsende, men det er salgsudløsende at de ved at de hver dag får en god sportsdækning. Hvis FCK eller Brøndby var blevet mestre forleden så kunne vi godt have haft det på forsiden, og specielt Brøndby da vi kan se at deres fans meget gerne læser B.T.
Hvis vi flytter over digitalt så er det lidt noget andet. Vi kan virkelig se en stor stigning i vores digitale trafik, hvis FCK, Brøndby eller landsholdet har vundet. Sport er noget der genererer meget mere trafik end normalt. Under Tour de France, hvor folk ikke har så meget andet at gå op i, der kan vi virkelig se en stigning på det der hedder sport, og vi kan se hvordan enkelte begivenheder virkelig gør noget ved den digitale trafik, mere end på salget af aviser. Men salget af aviser er også faldet kraftigt. Vi sælger måske 50.000 aviser hver dag og før i tiden, som f.eks. i 1986 da Danmark vandt 6-1 over Uruguay solgte vi 350.000, hvilket var kulmination på det der kæmpe store sportsavissalg. Siden er det gået ned ad bakke.

JDA: Men på andre platforme kan man se forskellene?

OSA: Det er vigtigt at sige at det betyder rigtig meget at man har en god daglig sportsdækning. Men vi kan også have historier der gør at vi sælger lidt flere aviser dagen efter. Store sportsnavne som Wozniacki, Michael Laudrup og Bjarne Riis trækker stadig lidt. Men det er på nettet man ser de store udsving.

JDA: Skaber I interessen eller skriver I om den interesse der er?

OSA: Det er begge dele. Sport er en eventjournalistik, der handler om kampe og turneringer. Det handler om at dække de store events, skrive op til, under og efter. Så derfor betyder eventen og TV rigtig meget da det er dem der sender kampen. Så TV er med til at drive interessen.
Men vi er også selv med til at sætte dagsordenen, og vi diskuterer hver morgen hvordan vi synes dagsordenen skal sættes. Vi går ud og skaber nogen historier på hvad der har været som så lægger op til hvad der kommer til at ske.

JDA: Følger I TV-dækningen (TV2sports satsning på NBA og TV3sport på ishockey)

OSA: Lidt, men de to store sportsgrene er fodbold og cykelsport og til dels håndbold.

JDA: Det er lidt overraskende at det er cykelsport

OSA: Jamen det er det. Hvis du ser ishockey for eksempel, så det noget der er meget centreret om nogle få byer; Rødovre, Herlev, Herning, Vojens, Odense og Aalborg. Og der går de helt vildt op i det, men fodbold er meget bredere, og cykelsport er det af en eller anden grund stadigvæk.

JDA: Hvem annoncerer inde i sportsdækningen?

OSA: Det kan man gå ind og se. Men dem jeg umiddelbart kan huske er faktisk TV-stationerne, fordi de går ind og har annoncer for en fodboldkamp i aften eller om at følge Formel 1 på TV3+. Så kan der være sportsudstyrsfirmaer, og så samarbejder vi også om at sælge billetter f.eks. til Brøndbys hjemmekampe via B.T.'s webshop.

JDA: Men det er da interessant at det er TV-stationerne der annoncerer?

OSA: Ja det skaber sådan en intern cirkulation og hjælper begge parter.

JDA: Hvilken type kunde har størst fokus på jeres sportssektion og køber de avisen oftere end andre læsere?

OSA: Det er meget mænd der bruger sport, det er helt sikkert. Vores læsere er typisk fra det lidt ældre segment, men sporten gør at vi kan tiltrække også unge læsere, og specielt unge mænd. Der er dog hovedsagligt digitalt, hvorimod de ældre mænd hovedsagligt køber avisen. Groft sagt så er det 80 % mænd der læser sport. 40 % køber B.T. pga. sporten så det er kernekunder, men sport er stadig et emne der deler.
Sport er noget der kan drive ting, men det er også noget som ikke siger nogen noget som helst.

JDA: Hvor stor har dækningen af sport været historisk contra i dag og fremadrettet? Er det en primær eller sekundær del af en avis.

OSA: B.T. har altid været en sportsavis. Det vil også fremadrettet være en vigtig del af avisens DNA, men om det lige forbliver på 25 % af udgifterne som i dag er svært at spå om.

JDA: Hvor stor en del af DR sportens budget gik til sports rettigheder?

OSA: Jeg kan ikke sige det præcist, men det er en meget stor del der går til rettigheder som EM og VM i fodbold samt OL. Viasat til gengæld bruger meget mere, og får DR's beløb til at virke som peanuts. Champions League, Superliga, Premier League og Championship rettigheder det er virkelig mange penge de bruger på det. Men Viasat bruger samtidig også mange penge på at producere de danske kampe, og de kapitaliserer helt vildt på det segment af sportsglade seere. Viasat har ikke kæmpe seertal på deres distribuering af Superligaen, ca. 300.000 tror jeg det er, men dem der er der er bare super trofaste, og det kan man sagtens køre en profitabel forretning på.

F – Interview with Denys Lund

Interviewer: Joachim Dissing Andersen

Date: 21st of May 2015

Name: Denys Lund

Profession: CRM campaign specialist at Danske Spil

Former: Student at CBS writing a Master thesis about the Danish sports betting market

JDA: Hvor stor er Danske Spils markedsandel i forhold til de andre spillere på det danske marked?

DL: Baseret på omsætning af sportspil kan det deles op i to – Offline contra online.
Offline har Danske Spil ca. 90 % af markedet, hvorimod vi kun har 25 % på Online markedet. På Online markedet har BET365 over 50 % af danske sportsspil.
Derefter kan man dele Danske Spil op i to; DLI og DLO
DLI (Danske Licensspil):Det er oddset, poker, casino etc. Dvs. på den liberaliserede del af markedet
DLO (Danske Lotterispil): Lotto, Eurojackpot, Quick etc. Dvs. på den stadig monopoliserede del af markedet

JDA: Hvordan er jeres indtjening fordelt mellem oddset, lotto, casino, poker etc.? Er der noget specielt der trækker kunderne i butikken.

DL: Det kommer an på hvad man ser på. Hvis man kigger omsætning er det der hvor spillerne klarer sig bedst at beløbet er højest, men det er nok bedre at kigge på BSI (Brutto Spil Indtægt, omsætning minus præmier) for at finde ud af hvor der er fortjeneste henne. Høje odds på fodboldkampe kan f.eks. godt give en høj omsætning, men lav BSI for en spiludbyder.
Men generelt giver store gevinster kunder i butikken og specielt Eurojackpot trækker en del hos Danske Spil for tiden, mens det typisk er sportsspil der trækker Bet 365's kunder.

JDA: *Hvordan har markedet ændret sig siden liberaliseringen? Bliver der spillet mere eller mindre generelt, på hvilke platforme bliver der spillet og er der vækst i industrien?*

DL: Konsolidering er et nøgleord, få større aktører dominerer markedet. BET365, Danske Spil, Unibet, Betsafe og NordicBet og Tipico.
Man skal have licens for at være bookmaker som koster 250.000 kr. årligt plus kunne garantere en likvid beholdning som kan garantere at spillerne får deres præmiesummer udbetalt. Samtidig er der en del lovmæssige krav som f.eks. at du som bookmaker ikke hvidvasker penge, at du betaler skat

osv.
Derfor er det ikke så nemt for nye spillere at komme ind på markedet. Men den er dog faldet siden liberaliseringen, men er på vej op igen, da brands er ved at være en afgørende faktor på markedet. Sportsspil vækster uden tvivl og eksploderede efter liberaliseringen i 2012, og vokser stadig meget, selvom der dog er en lille begyndende mæthed.

JDA: Hvad er det største trækplaster for jer hos Danske Spil i forhold til at hive kunder i butikken?

DL: store gevinster som f.eks. den for nyligt store Eurojackpot pulje på 390 mio. er noget vi virkelig kunne mærke. Samtidig har vi den fordel i Danske Spil at vi har en del forskellige brands som gør at vores kunder har mange valgmuligheder når de er kommet ind i butikken. På den anden side gør det os mindre fokuserede i forhold til f.eks. BET365, som selvom de har andre produkter, hovedsagligt er en sportsbookmaker. Der kan vi simpelthen ikke konkurrere da vi stadig har en generisk tilgang til industrien, dvs. vi ikke er 120 % eksperter på området da vi har mange andre områder vi skal holde øje med.

JDA: Hvilke sportsgrene bliver der spillet mest på? Kan i hos Danske spil mærke at mediefokus flytter spillekroner? (NBA på TV2)

Absolut. Jo flere kampe, jo bedre fordelt og jo mere mediefokus er positivt for Danske Spil. Det er i Danske Spils interesse at der er sport 24-7. Det er positiv spiral og kan mærkes på bundlinjen. Det virker dog også den anden vej, så hvis sporten mister sin troværdighed, i form af matchfixing eller korruptionsskandaler, så mister bookmakerne også deres troværdighed. Derfor er der visse ligaer, herunder nogle afrikanske, østeuropæiske og asiatiske, som Danske Spil ikke dækker da vi har stor fokus på ansvarlighed.

JDA: Hvad er de største udfordringer og vækstområder for jer og markedet?

Hvis en sport mister seere så mister bookmakerne også penge. Men doping er ikke den største fare for bookmakernes synspunkt. Men vi er meget afhængige af hvordan det går sporten generelt.
Men vi har også segmenter som vokser helt enormt, som f.eks. e-odds hvor man kan gå ind og spille på computerspilsturneringer som FIFA og Counter Strike. Men troværdigheden kan godt diskuteres på dette område, og hvis vi har en fornemmelse af at der kunne være aftalt spil, så tilbyder vi simpelthen ikke spil på det, da risikoen er for stor.
Et andet problem vi har, er at det er svært at kontrollere hvidvaskning af penge når kunder spiller

offline og derved anonymt f.eks. sætter sorte eller stjålne penge på ”sikre” spil eller handler med vindene kuponer og derved kan retfærdiggøre deres kontante beholdninger. Men det er et lille marked.

I forhold til vækstområder så er platformen mobil kommet rigtig meget i fokus de seneste par år. Jeg tror at halvdelen af Danske Spils online omsætning fra Oddset kom ind via mobiltelefon, hvilket også siger rigtig meget om hvor vi er på vej hen. For selvom mere og mere spil foregår online så tror vi ikke på at den fysiske oddset eller lottokupon nogensinde dør, da flere undersøgelser viser at den psykologiske virkning af at have en fysisk kupon i hånden har en afgørende effekt. Vi bliver dog udfordret på området af Tipico, Stanley bet, og Cash Point. Så vi har en udfordring i fremtiden, også i forhold til at få skabt nogen synergier imellem vores kanaler.

JDA: Har i et netværk som hjælper jer med at opdage snyd før det er for sent?

Alle bookmakere har en masse forskellige samarbejdspartnere. Men odds sætterne i dag er mere børsmæglere som mere handler med odds. Selvfølgelig har de noget software som fortæller dem hvad oddset burde ligge omkring og hvis der lige pludselig bliver spillet for rigtig mange millioner på et bestemt resultat så er der en klokke der ringer og sætter spørgsmålstegn ved om alt er som det skal være.

JDA: Hvor stort er problemet omkring matchfixing? Konkrete værktøjer, udbredelse i DK og globalt, hvordan ser fremtiden ud?

DL: Vi har stor fokus på ansvarlighed, og har blandt andet et samarbejde med Dansk Boldspils Union og indflydelse omkring lovgivningen på området.
Men jeg tror ikke der en aftale bookmakerne imellem i forhold til at kommunikere risikofyldte spil til hinanden

JDA: Hvad er den største forskel i måden i driver forretning på i forhold til private virksomheder?

DL: Eksternt i forhold til kunderne er der stort fokus på ansvarlighed (ludomani, aggressiv markedsføring, matchfixing) og derfor må vi ikke lave bonusspil og tilbud på samme parametre som konkurrenterne. Vi prøver så vidt så muligt at være gennemsigtige i forhold til vores konkurrenters nogen gange lidt komplicerede velkomstbonusser.
I forhold til Ludomani i spilindustrien så sætte vi ofte i forbindelse med alkohol, tobak og våbenindustrien i og med at vi har den her negative eksternalitet. Så det er kæmpe problem for

bookmakere generelt, men Danske Spil gør meget på området og har bl.a. oprettet Ludomanilinjen til at afhjælpe problemet, hvilket ikke kun hjælper kunder fra Danske Spil.
Vi er samtidig ikke performance drevet på samme måde som vores konkurrenter. Men vi er dog stadig presset af staten til at performe godt, men ikke i samme grad som private firmaer er presset af deres ejere.
Samtidig går vores overskud fra DLO midlerne tilbage til samfundet hvilket også gør at nogle kunder vælger os over vores konkurrenter.

G – Legislative rules

All sections (§) are retrieved from "Lov om Investeringsforeninger" (Erhvervs - og Vækstministeriet/Finanstilsynet, 2013)

§ 2(5) - Et investeringsinstituts (UCITS') hjemland: Den EU medlemsstat, hvor investeringsinstituttet har opnået tilladelse i henhold til artikel 5 i direktiv 2009/65/EF af 13. juli 2009 om samordning af love og administrative bestemmelser om visse institutter for kollektiv investering i værdipapirer (investeringsinstitutter) (UCITS-direktivet).
§ 2(6) - Et investeringsinstituts (UCITS') værtsland: En EU medlemsstat, som ikke er investeringsinstituttets hjemland, og hvor andelene i investeringsinstituttet markedsføres

§ 3 - Virksomheder skal have tilladelse af Finanstilsynet som danske UCITS, jf. dog også § 4, for at kunne udøve virksomhed, som 1) består i
a) fra en videre kreds eller offentligheden at modtage midler, som under iagttagelse af et princip om risikospredning anbringes i finansielle instrumenter i overensstemmelse med reglerne i kapitel 14, eller
b) som et masterinstitut, jf. § 2, nr. 20, enten at modtage midler fra en videre kreds eller offentligheden og have et feederinstitut blandt sine investorer eller at have mindst to feederinstitutter som investorer og anbringe midlerne i finansielle instrumenter under iagttagelse af et princip om risikospredning i overensstemmelse med reglerne i kapitel 14, og som 2) består i på en investors anmodning at indløse investorens andel af formuen med midler, der hidrører fra formuen.
§ 3(10) - En investeringsforening, der søger tilladelse efter stk. 1, skal have en formue på mindst 10 mio. kr. i hver afdeling. Immaterielle aktiver medregnes ikke i formuen

§ 68 - En dansk UCITS må ikke optage lån. Stk. 2. Finanstilsynet kan dog tillade, at en dansk UCITS på vegne af en afdeling:
§ 68(1) - optager kortfristede lån på højst 10 pct. af en afdelings formue for at indløse investorernes andele, for at udnytte tegningsrettigheder eller til midlertidig finansiering af indgåede handler
§ 68 - (2) optager lån på højst 10 pct. af en afdelings formue til erhvervelse af fast ejendom, der er absolut påkrævet for udøvelse af den danske UCITS' virksomhed. Stk. 3. De i stk. 2, nr. 1 og 2, omhandlede lån må tilsammen højst udgøre 15 pct. af en afdelings formue

§ 139 - En afdeling må investere i værdipapirer og pengemarkedsinstrumenter, som 1) har fået adgang til eller handles på et reguleret marked, jf. § 2, nr. 16,

§ 147 - En afdeling må højst investere sin formue i værdipapirer og pengemarkedsinstrumenter udstedt af samme emittent eller emittenter i samme koncern inden for følgende grænser: 1) 5 pct. af afdelingens formue. Denne grænse kan dog forhøjes til 10 pct., hvis den samlede værdi af investeringer, der overstiger 5 pct., ikke overstiger 40 pct. af afdelingens formue.

§ 157 - En dansk UCITS eller en afdeling af en dansk UCITS må ikke i et enkelt aktieselskab erhverve aktier med stemmeret, som giver den danske UCITS mulighed for at udøve en betydelig indflydelse på aktieselskabet.
Stk. 2. Flere danske UCITS, der har samme bestyrelse eller investeringsforvaltningsselskab, må ikke tilsammen kunne udøve en betydelig indflydelse på et enkelt aktieselskab.
§ 157(1) – En dansk UCITS og en afdeling af en dansk UCITS må ikke erhverve mere end 1) 10 pct. af aktierne uden stemmeret fra en og samme emittent.