Using Investment Funds to Support Advancements in Healthcare

Anthony M. Nawar

Degree Thesis
International Business
2017

DEGREE THESIS	
Arcada	
Degree Programme:	International Business
Identification number:	16583
Author:	Anthony M. Nawar
Title:	Using Investment Funds to Support Advancements in Healthcare
Supervisor (Arcada):	Svein Eldon
Commissioned by:	Anthony M. Nawar

Abstract:

The topic of this thesis is about using investment funds to support advancements in healthcare. The structure is designed to identify the relevant elements in a funding strategy that can be used to support healthcare companies likely to produce usable solutions.

The research objective is to establish a proper investment fund strategy that supports healthcare. Additionally, it is positioned to highlight the dynamic components that outline the viable fund.

The preliminary scope of the literary review considered the following elements to be relevant subjects for evaluation on: current healthcare funding and challenges, successful funds both inside and outside the health sector, various fund types, strategies, approaches, and structure possibilities within the mutual fund and hedge fund industry.

The components and discussion portion of this thesis are intended to deliver the prescription that constitutes the viable fund model. The function of which requires the dynamic application of several constituent elements. The components that make up the fund model include fund type, investment objectives, strategic investment policy, investment approach, risk approach, fund structure, and the general strategy. The research findings that make a case for a viable fund are carefully assessed to guarantee overall compliance with the risk mitigation technique, research aim, fund structure. To meet the research objectives efficiently, the components were connected to the macro context by using a hybrid strategy of three separate schemes. The resulting investment strategy was ultimately designed to support the amalgamation of multiple strategies, objectives, and priorities throughout time to

meet the research aim.

Keywords:	Investment Fund, Investing, Healthcare, Biotechnology, Mutual Fund, Hedge Fund, Pharmaceutical, Strategic funding
Number of pages:	
Language:	English
Date of acceptance:	

Table of Contents

1. **INTRODUCTION** **1**
1.1 Background 1
1.2 Research Aim 5
1.3 Research Questions 5
2. **RESEARCH DESIGN** **6**
2.1 Method 6
2.2 Demarcation 8
2.3 Abbreviations & Definitions 8
3. **LITERATURE REVIEW** **9**
3.1 Investment Fund Overview 9
3.2 Mutual Funds in General 10
3.3 Authority over Mutual Funds 13
3.4 Types of Mutual Fund Structures 13
3.5 Hedge Funds in General 15
3.6 Hedge Fund Strategies 15
3.7 Hedge Fund Structures & Overview 17
3.8 Hedge Fund Corporate Governance 19
3.9 Healthcare Funding Overview and Challenges 20
4. **CONCLUSION** **24**
4.1 Viable Fund Components & Discussion 24
5. **References** **30**

Figures

Figure 1. Percentage of household financial assets held by investment companies; year 1980–2014 Source: Investment Company Institute………………………………………………2

Figure 2. Equity funds held 52% of total mutual fund assets in 2014. Source: Investment Company Institute…………………………………………………………………………………10

Figure 3. Number of Investment companies by type 1997-2014. Source: Investment Company Institute………………………………………………………………………………….12

Figure 4. Structuring a Hedge Fund. Source: Mwellp.com………………………………18

Figure 5. Rising cost of developing a new drug. Source: Tufts Center for the Study of Drug Development ……………………………………………………………………………21

Tables

Table 1. R&D costs by therapeutic category. Source: Drug Information Journal……22

1. INTRODUCTION

1.1 Background

The topic of this research is regarding effective, relevant Investment- funding strategies that enable a positive impact on the healthcare sector alongside generating a financial return. It is motivated by the never-ending challenges associated with human healthcare, and the assistance that investment- funded vehicles can provide. Due to the practical aim of this study; the research context assumes a prescriptive model. The research objective is to establish a suitable investment fund strategy that supports healthcare companies. Additionally, it is positioned to highlight the components that are most likely to support prominent healthcare companies.

To provide a macro context by which the theoretical framework is based on; The author explains the concomitant relationships between relevant themes in the study: The elements of the framework central to the thesis include: Investment funding, Healthcare goals, Scientific achievement, technology, free enterprise, and investor behavior.

The idea of funding by investment allows investors with a common interest to pool resources together, usually under professional management & supervision. The built-in advantages of investment funds include economies of scale, risk management, asset diversification, and a wide selection of investment opportunities. Investment funds are becoming increasingly large and powerful. Investment funds have a unique ability to furnish almost any endeavor and serve as a catalyst for business activities in the long or short term. According to the 2015 Investment Company Fact Book: In the year 2014, U.S. Mutual funds held an estimated 18.2 Trillion, while worldwide holdings amounted to approximately 33.4 Trillion. At the end of 2014, investment funds accounted for 24% of household financial assets. Historical growth of the percentage of shares held by investment companies over the past decades can be seen in the figure below.

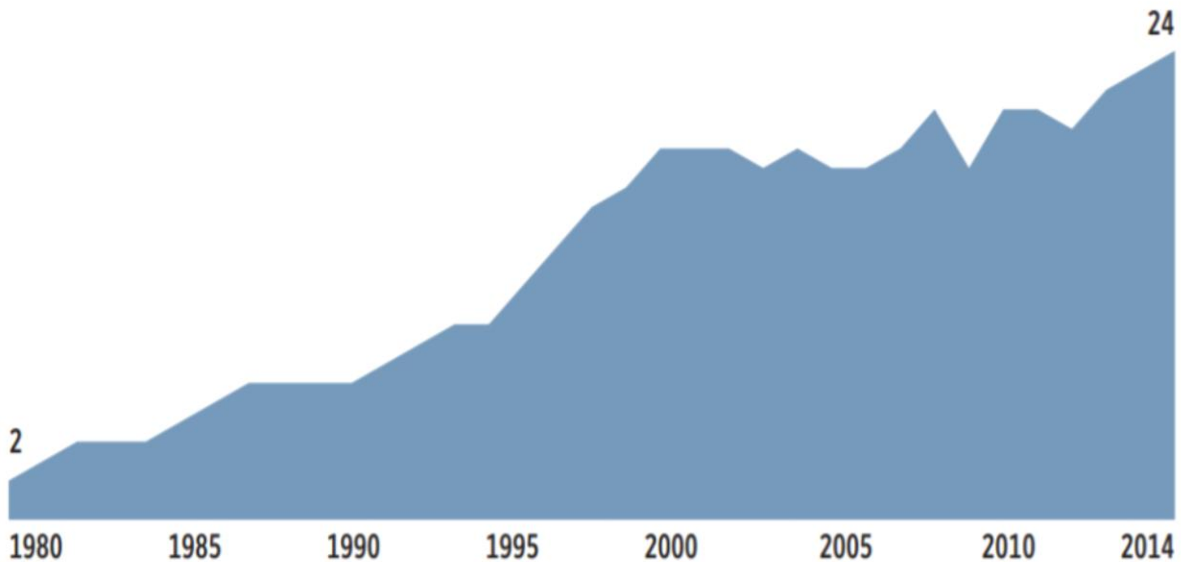


Figure 1. Percentage of household financial assets held by investment companies; year 1980–2014. (Investment Company Institute, 2015)

For individuals, about half their assets in 401(k) and similar plans or retirement accounts were invested in mutual funds alone. Funds have seen tremendous growth in both popularity and utility because they allow a wide range of actors to benefit from their customizable structure and inherent potentials. (Investment Company Institute, 2015)

Improvements in healthcare research and treatment solutions have long been a collective effort supported by institutions and the leadership in most societies. The societal burden imposed by diseases not only affects the quality and quantity of human life; they also have a considerable strain on economic efficiency. U.S healthcare costs account for 17.5% of the total GDP with an average cost of $9,523 per person (Martin et al., 2015. 150-160). In the United States, two diseases account for approximately half of all deaths, heart disease, and cancer. (Nichols, 2015). In 2012, a group of medical researchers set out to examine sustainability in healthcare funding. The study was conducted to compare the

funding of cancer research with the actual burden imposed by each type of cancer. The results showed considerable inconsistencies in research funding levels when compared to the societal burden. The study contended that the allocation of funds should appropriately match the societal burden. (Carter, 2015)

Researching and developing solutions to prevent and treat diseases typically originate in the science/research lab. Scientists, medical researchers often face funding challenges due to the complex nature of producing useable discovery. Producing results (Treatments, drugs) in medical R&D is costly, risky by nature and often requires significant additional funding to make it to commercialization. Companies with secure intellectual property and a clear business plan, a track record of repeated innovation, and a strong management team represent the ideal biotechnology firm.

Almost all the recent progress made in healthcare with regards to enhancing quality and quantity of human life has been made possible with the help of Science. Impactful breakthroughs that enhance our understanding the world often begin with scientific discovery. Researchers from the University of California Berkley emphasized the relationship between science and technology as: "Science and technology feed off one another, propelling both forward. Scientific knowledge allows us to build new technologies, which often allow us to make new observations about the world, which, in turn, allow us to build even more scientific knowledge, which then inspires another technology … and so on."(Understanding Science, 2016)

When it comes to revolutionizing the world in which we live, technology has proven to be an indispensable tool. The current upwards trend of technological achievement is unprecedented. Just as the advent of physical tools propelled human development. The gains in technology represent a new set of tools being made available for public use. These tools represent an extension of human ability that can not only solve today's problems but enable future solutions.

Private enterprises around the world are building these tools with unmatched efficiency and utility. Just as science inspires technological innovation, the application of that technology is by in large made possible by profitable companies. Companies motivated by profit tend to improve on that technology and rely on mass adoption to reduce the cost of

the technology itself. This effectively supplements the environment with an extra layer of support. Now the environment contains two tools that complement each other and has incorporated capitalism as the driving force. Industries like biotechnology are the product of blending the abilities of technology and science.

The unique aspect to consider is how incentives play a role in this new environment. Improvements in human health require scientific discovery. Technology enables and stimulates scientific discovery, and knowledge in science promotes the development of technological solutions. Private enterprises amplify these solutions by maximizing their utility and distribution, thereby lowering the costs and risks associated with innovation. The evidence suggests that significant advancements in human health are greatly supplemented when the incentives of private enterprise intersect with the objectives of philanthropic and charitable actors. The convergence of incentives implies the maximization of participation and resource allocation by leveraging and combining existing behaviors across the spectrum.

The last element to set the motivation by which the study begins the investigation is the underlying mechanisms that unite investors with healthcare advancement. For the healthcare companies to produce usable solutions, access to massive capital markets is paramount. Investment funds have certainly proved to be a valuable tool in connecting people with ideas, and have evolved significantly well over the past few decades. They are sophisticated enough to accommodate intangible assets alongside tangible financial instruments making them uniquely powerful tools. Investing is typically motivated by financial return. However, the idea of impactful investing has gained popularity in recent years. "Impact investing" is an emerging asset class that aims to amplify social benefits as well as generates financial returns. It is a permutation of Socially Responsible Investing designed to blend the values of philanthropy and traditional investing. Given the challenges being faced, investment funds certainly hold massive potential to impact the healthcare sector in a positive way; the question then becomes how.

1.2 Research Aim

The purpose of the research is to establish the applicable elements with regards to investment funding and how they might support health care companies likely to produce useful solutions. Upon analyzing the relationship between funding and healthcare; the research aim is then to identify the methods and strategies that can be used to leverage and align the goals of investors to increase participation and resources towards healthcare initiatives.

The research will explore leading funding arrangements by merit of potential to influence. The research is also designed to assess the existing ecosystem for undercapitalized opportunities and to take it a step further by proposing a viable solution strategy. The chosen elements of the research are explored and discussed so that they may be used by anyone who wishes to set up a such a fund. The demand for healthcare improvements is perpetual in nature, and universal issue shared by all. The challenges that face the healthcare sector are without question some of the most challenging and resource-intensive to solve. This study is predicated on the notion that for-profit businesses are the foremost drivers of healthcare advancement and thereby aims to strengthen these drivers by appropriately leveraging financial resource tactics.

1.3 Research Questions

1. How can investment funding support the healthcare companies that are likely to produce useful solutions?
2. What are some effective investment fund structures, methods, and strategies that might attract the most capital towards healthcare?

2. RESEARCH DESIGN

2.1 Method

The purpose of this section is to provide explanations regarding the methods used in the research. This includes the method of data collection, the interpretation of that data, and how the data is applied.

The adopted methodology for this study is largely driven by the aim of the research. The aim of the research is fulfilled when the research questions are addressed in that they propose and validate strategic funding policy. The style of questioning usually falls under one or more of the five research paradigms.

The five types of research paradigms are:

- Descriptive
- Evaluative
- Predictive
- Exploratory
- Prescriptive

These paradigms influence the scope and method by which data is collected, analyzed, and applied throughout the research.

The line of questioning in this particular study involves two separate styles of research, evaluative and prescriptive. Since the aim is to evaluate leading funding arrangements while adhering to certain requirements, nature can be considered evaluative. After the evaluation, the prescription approach is used and goes beyond the first approach by asserting a potential solution to the problem. The prescriptive method framework implies a collection of strategies to administer. Before recommending a solution, the study gathered relevant information to be evaluated. This information is outlined in the literary review and can be seen as the ingredients necessary to deliver a prescription.

The secondary research is structured and explained historically as to how various fund structures appropriately serve different objectives throughout time. In the literature review, there will be an overview of investment funds to inform the reader of what investment funds are capable of with the underlying theme of how, why, and when they are useful. The following chapter to this section is meant to research deeper to explain the origins, regulatory setting, and to assess the various types of mutual funds, as they are a core element of exploration. Hedge funds are also a topic of interest for their unique ability to leverage, hedge, and manage capital with less regulatory oversight.

The relevant information is then compiled by the author to answer the research questions and fulfill the research aim. The relevant elements for evaluation include funding types, existing successful investment funds within healthcare, regulatory landscapes, favorable companies to fund, as well as the investment approach. Additional topics of interest include the current overview of modern day investment funding, impact ability, strategies, and approaches to attract significant amounts of capital. Investigating the criterion and method by which promising companies are incorporated in the portfolio is also a key element.

One unstructured Interview took place with an experienced asset manager for the purpose of gathering general overview regarding optimal practices, jurisdictional advantages, investor relations, the interview assisted in narrowing the focus and scope of the literature review. The discussion briefly touched on the requirements by which institutional investors may engage with a fund, as well as the legal framework of soliciting, marketing securities to institutions and other investors. The potential to incorporate Individual retirement accounts as well as collective pension plans was also discussed.

After analyzing the investment fund landscape, the researcher shifts focus to how the previous assessments relate to Investment regarding healthcare impact. After the initial description and introduction of the topic of healthcare, the research aims to highlight the potential for developments in healthcare investing, bearing in mind the prominent role companies play in the strategy of an investment fund. Specifically designed to shed light on effective strategies that address current challenges being faced. The next point in the paper will then be to propose the conditions and context of the appropriate fund and to

provide a dynamically appropriate strategy. The last chapter incorporates a tone of discussion in which the author provides conjecture to the study bearing in mind the complex orientation by which the study commenced.

2.2 Demarcation

The scope of this paper is to examination investment fund vehicles that can provide a viable platform to fund healthcare advancements. The evaluation of existing literature will support the research aim and will be evaluated to confirm inquiries as to how they support health care achievements. Upon exploring relevant and beneficial elements in fund structures/strategies, the chosen elements are then carefully considered in addressing the research questions. This includes synthesis of various strategies to approach investing and to address application potential and limiting components. The synthesis is intended to produce a viable (fund) method while elaborating on the core components included. In the literary search for viable funding methods, the research is limited to two main fund verticals: Hedge Funds, and Mutual funds. The research collected regarding the legal framework, marketing methods, and general investment undertaking assumes the United States as the primary setting. The research is secondarily targeted to the end of enhancing the health span, lifespan, and life expectancy of the investor. Therefore, the strategy of the viable fund is to be one that includes investing in companies of different focus such as pharmaceuticals, biotechnology, personalized medicine and businesses from various sectors that directly or indirectly support healthcare advancement.

2.3 Abbreviations & Definitions

IPO	Initial Public Offering
FDA	Food and Drug Administration
IP	Intellectual Property
VC	Venture Capital
R&D	Research and Development
SEC	Securities and Exchange Commission

3. LITERATURE REVIEW

3.1 Investment Fund Overview

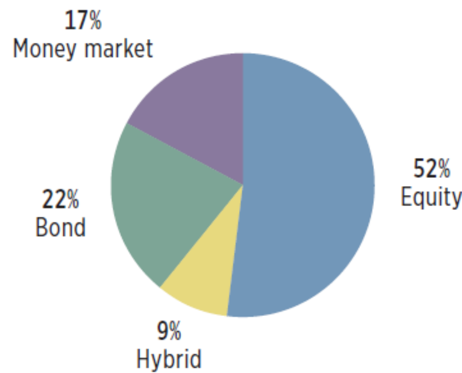
The concept of pooling financial resources to facilitate business, minimize risk, and yield investor returns has existed for a long time. Undertaking collective investments in transferable securities were first used in 18th century Holland preceding a financial crisis. Intentions were to minimize financial risk of government bond acquisition by encouraging participation from smaller investors (Vanderbyl and Kobelak, 2007). In recent decades Investment funds have received major attention; especially in the 1980's & 90's when they produced record high returns for investors across the globe. Scalability, leveraging, and diversification under professional management are conceptually some of the most powerful tools, which intensify with collective effort. These concepts represent the core elements that make investment funded vehicles powerful.

The desired outcome of an investment fund is typically classified by capital growth or value (income) growth. Investment funds tend to serve either a single asset class or a mixture of asset categories. Risk-reward profiles vary by asset class; The main asset class categories include:

- Equities (Stocks),
- Fixed income (Bonds)
- Commodities
- Real Estate
- Cash equivalents (Money market instruments).

Depicted in figure 2 below; Equity funds accounted for the majority of all net assets within mutual funds in the year 2014, making it the most popular asset type.

Equity Funds Held More Than Half of Total Mutual Fund Assets
Percentage of total net assets, year-end 2014



Total U.S. mutual fund assets: $15.9 trillion

Figure 2. Equity funds held 52% of total mutual fund assets in 2014. (Investment Company Institute, 2015)

3.2 Mutual Funds in General

The mutual fund industry is comprised of professionally managed investment companies that undertake investments from the public as well as institutions who are willing to invest in the purchase, sale or trade of securities. The mutual fund was started to enable commoners with limited means to participate in owning a portion of the market. The people did not have to spend much time practicing due diligence; rather they were sold a dream, a dream that could potentially result in financial freedom.

Modern mutual funds in the United States are believed to have started after the creation of the Massachusetts Investors Trust in Boston in the year 1924, eventually going public in 1928. By 1929 The U.S. had more than nineteen open-ended mutual funds and approximately seven hundred closed-end mutual funds. The stock market crash of 1929 devastated the industry and wiped out most of the closed end mutual funds, but most the open end mutual funds were able to survive the collapse.

Mutual funds started to grow at an alarming rate and in the 1950s; there were more than one hundred mutual funds in the United States alone. The bull markets which occurred in the 1980s, and 1990s, also enabled the mutual funds to grow, even more, eventually reaching over three thousand in the United States. Total assets of mutual funds were estimated to be over one trillion US dollars in this period. The government began to put more corrective measures to regulate mutual funds following the mutual fund's scandal that occurred in the early 2000's. Despite these measures, mutual funds continued to grow at an accelerated rate. In the year 2006, there were estimated to be more than eight thousand mutual funds in the United States with new markets opening in countries all over the world. The total assets of the more than eight thousand mutual funds in the United States were estimated to be approximately ten trillion us dollars. The figure below shows the historical growth of various types of mutual funds throughout time.

Number of Investment Companies by Type
Year-end, 1997–2014

	Mutual funds*	Closed-end funds	ETFs	UITs	Total
1997	6,778	485	19	11,593	18,875
1998	7,489	491	29	10,966	18,975
1999	8,003	510	30	10,414	18,957
2000	8,370	481	80	10,072	19,003
2001	8,518	489	102	9,295	18,404
2002	8,511	543	113	8,303	17,470
2003	8,426	581	119	7,233	16,359
2004	8,417	618	152	6,499	15,686
2005	8,449	634	204	6,019	15,306
2006	8,721	645	359	5,907	15,632
2007	8,745	662	629	6,030	16,066
2008	8,879	642	743	5,984	16,248
2009	8,611	627	820	6,049	16,107
2010	8,535	624	950	5,971	16,080
2011	8,673	632	1,166	6,043	16,514
2012	8,744	602	1,239	5,787	16,372
2013	8,974	599	1,332	5,552	16,457
2014	9,260	568	1,451	5,381	16,660

Figure 3. Number of Investment companies by type 1997-2014. (Investment Company Institute, 2015)

The mutual fund has become more and more relevant in day to day life due to the significant role they play in household financial planning and retirement. The mutual fund industry is also important because it provides the investors with a convenient form of investing under professional management while offering diversification and liquidity. They were initially seen as an obscure financial instrument, but have since grown to become economically and personally essential. It is estimated that more than eighty million people in the United States invest in mutual funds, making it a critical component of the U.S.

economy. The American people have invested billions of dollars in the mutual fund industry, and many families' livelihood depends on the success of mutual funds (Investment Company Institute, 2016).

3.3 Authority over Mutual Funds

Mutual funds in the United States are under the jurisdiction of the federal government and must be registered with the United States Securities and Exchange Commission. The Investment Company Act of 1940 is the legislation that governs the operations, structure, and rules for mutual fund investment companies. The act requires that any investment company with more than one hundred investors register and be subject to full disclosures of investment activity, board member duties, and most other day to day activities.

The Securities and Exchange Commission was created to regulate the mutual funds among other investments offered to the public to safeguard the average citizen willing to invest in them. The United States government passed a Securities Act in the year 1934 that regulated the sale and purchase of all securities, and the advisors who brokered the transactions. The SEC continues to be the governing force that checks the ecosystem for potentially fraudulent or dangerous activity as well as the entity that enforces legislation with regards to investment companies (Investment Company Institute, 2016).

3.4 Types of Mutual Fund Structures

There are three main types of mutual funds in the United States are open-end funds, close-end funds, and unit investment trusts. The open-end mutual fund is the most common mainly because they can buy back shares from investors daily. They are also the most common due to accessibility; open-ended funds are available for purchase either directly with the fund or indirectly through sales agents. Most open-end funds sell shares to the public daily. Purchasing and selling securities, however, fall under the purview of the fund manager. The number of shares that can be issued is technically without limit, and the number varies and is largely dependent on the share purchases, share redemptions as well as fluctuations in market price (Haslem, 2015).

The closed end mutual funds on the other hand only offer shares to the public at the point in time when they are formed. The closed end mutual funds are formed through an initial public offering, and only then are they listed on the stock exchange for interested members of the public. However, once the investors purchase the shares, they do not have the option to resell them back to the fund. This is a key factor that distinguishes open and closed ended mutual funds.

In a closed end mutual fund, investors can only sell their shares to other investors who may be interested in buying. The price at which they sell to the other investors may also vary depending on the market situation. It may be lower or higher than the net asset value. When it is greater than the net asset value, it is said to be at a premium; accounting for the specific costs associated with that transaction. However, these shares are usually sold at a discount that is lower than the net asset value. Making it an attractive investment opportunity for other investors. The buying and selling of shares within a closed end mutual fund are regulated by a professional investment manager whose job it is to ensure that the trades are carried out appropriately.

The other type of the mutual funds is called unit investment trusts. Like the closed-end mutual fund, they can only issue their shares and securities once, and that is when they are created. However, unlike any of the other mutual funds, the unit investment trust has a limited life span that is set once it has been created. The portfolio of a unit investment trust is usually represented by a trustee or service provider and does not necessarily require active management. They have one similarity to the open end mutual funds in that the investor shares are redeemable at any time after the purchase or they can wait until the point of maturity when the unit investment trust will complete.

The unit investment trust mutual funds also have another unique characteristic in that they have the ability to sell their shares in the open market. There are an estimated six-thousand-unit investment trust mutual funds in the United States with an approximate value of assets that amount to over one hundred billion dollars. (Haslem, 2015)

3.5 Hedge Funds in General

Hedging risk has been a widely-used concept by investors through the years. The phrase "hedge fund" can be traced back to 1949. At that time, most investors opted for long-term market positions which prompted Alfred Winslow Jones to write an article pointing to the fact that investments could yield a higher return if hedging were to be applied to their investment techniques. To prove his hypothesis, Jones entered into an investment partnership and integrated short selling and leverage into his technique. The objective of implementing the two was to increase the returns while at the same time lower the risks involved. By doing this Jones was able to establish two fundamental features that are still widely acknowledged and used. To achieve this, Jones applied an incentive of 20 percent and personally invested his money into the fund. He did this to demonstrate that his personal goals were aligned with the investors.

Through his approach, Jones managed to achieve outstanding results. Between 1962 and 1966, Joneses approach surpassed other funds by more than eighty-five percent. His twenty percent incentive fee allowed these individuals to earn as much as ten to twenty-fold compared to the little they earned from "long-only" money managing services. Joneses dynamic and unique approach saw the launching of over a hundred and forty hedge funds in the following two years. This earned Jones, the title ‘the father of the hedge fund industry.' (Ineichen, 2002)

3.6 Hedge Fund Strategies

Each hedge fund applies its unique strategy to differentiate from the others. However, most of these strategies can be grouped together in categories designed to assist a potential investor to make decisions on which hedge fund to invest in. Hedge fund strategies are typically categorized into four major categories namely: global macro, event-driven, directional and relative value (arbitrage). A fund manager may decide to employ more than one strategy to allow for more flexibility, better risk management as well as to extend diversification.

Global macro: Hedge funds that implement this strategy usually invest in shares, bonds and currency markets. This type of strategy anticipates the occurrence of various macro-economic events that will generate a risk-adjusted return on their investments. Hence hedge fund managers must analyze global market incidences and trends to recognize the opportunities that these events provide. This type of strategy anticipates that the investment will attract good returns from the projected price shifts (Hedge Fund Basics - Managed Funds Association, 2017). One important factor when using this type of strategy is to ensure proper timing as to guarantee high risk-adjusted returns. The global macro strategy can be classified into either discretionary or systematic. Discretionary trading is whereby the fund manager identifies and chooses various investments that the fund will invest in. Systematic trading involves the usage of mathematical models to find the best investments to trade in. Software executes these mathematical models with little human engagement. Also, this kind of strategy can earn profits by following a trend or countering a trend by anticipating profit events from trend reversals.

Event-Driven: This type of strategy involves situations where the investment opportunity or risk is associated with a certain event. This kind of strategy traces investment opportunities in events such as acquisitions, consolidations, bankruptcies, and liquidations. Managers who rely on this strategy must put much emphasis on valuation irregularities in the before and after the occurrence of such corporate oriented events. These corporate oriented events are usually categorized into three classes which include distressed securities, risk arbitrage, and special situations. Distressed securities involve incidences like restructuring and bankruptcies. Hence, it includes investing in bonds, loans or companies that are going bankrupt or are experiencing financial issues.

Risk arbitrage is used where mergers, acquisitions, and liquidations are taking place (Hedge Fund Basics - Managed Funds Association, 2017). This involves trading the stocks of two or more firms that are merging to benefit from discrepancies that arise because of irregularities between the acquisition and stock price. However, this type of strategy can backfire if the merger fails to go as planned. The last classification is with regards to special situations where certain occurrences like restructuring may influence the value of a firm. This may also occur when spin-offs, security issuance/repurchase, and asset sales take place. For hedge fund managers to take advantage of such events, they must identify them before they occur. A good manager using this type of strategy must be able

to determine events that will negatively or positively affect the value of a company and invest in it.

Directional: The directional investment strategy relies on market shifts and deviations when choosing stocks from a given market. To choose the best possible stocks, computer models can be applied, or fund managers can personally search for and choose investments. This type of strategy offers more exposure to variations across an entire market, especially when compared to other market impartial approaches. If a fund manager has conviction about the direction of a market, he or she may use this method to investing in specific sectors such as technology, healthcare, biotechnology, and energy. The directional hedge fund strategy is often used by U.S and international long and short equity hedge funds. This is whereby long equity options are hedged by using short sales of equities (Hedge Fund Basics - Managed Funds Association, 2017).

3.7 Hedge Fund Structures & Overview

Hedge funds can be based on a variety of structures that make each of them unique as to the method by which the fund achieves its goals; which is outlined the fund's private placement memorandum. Different hedge funds have different investment strategies as well as organizational structures. Hedge funds are almost always structured differently and should be evaluated based on intended structure and strategy. One feature that makes hedge funds more desirable to investors is the ability to "short" stocks with fewer restrictions than other fund verticals. "Shorting" in a clear sense is betting on a decrease in value of a particular asset or asset class. It is worth mentioning that while hedge funds have more complex capabilities, they do pose an elevated risk to less experienced investors. This is why the SEC has limited the solicitation of investors to "Institutional investors" and "accredited" investors with a net worth of over 1M USD or annual income of 200k USD or higher.

The hedge fund fee structure is one of the core motivations that entice top money managers to launch their hedge funds. Hedge funds charge management fees usually ranging between one and two percent of the assets being managed. However, this rate is not fixed and can be higher depending on the track record of the manager.

The fees are calculated and paid as per the agreed upon terms either on a monthly or a quarterly basis. Additionally, Investors may pay performance fees that typically reach twenty percent of yearly net profits, based on the fund managers' performance. These fees are in place to incentivize the fund manager to perform and produce outstanding results. This is separate from management fees which are paid to cover a manager's operating costs. Despite the high fees associated with investing in hedge funds, they do provide a substantial platform that allows investors to diversify and significantly reduce their overall risks thereby balancing the tradeoff (Hedge Fund Basics - Managed Funds Association, 2017).

The General/ Limited partnership is the most common structure for hedge funds. In such a structure, the general partner reserves right to decide how the fund will operate. The limited partners can invest in the partnership and are only responsible for their expenditure. The basic rule governing this structure is that there must be at least one general partner and one limited partner (Liu and Mello, 2011). Additionally, there can be more than one general partner and multiple limited partners. However, the Securities and Exchange Commission (SEC) regulation limits the number of investors to ninety-nine to qualify for SEC registration. The following figure is an illustration of the structure typically outlined in a Hedge Fund General Limited partnership.

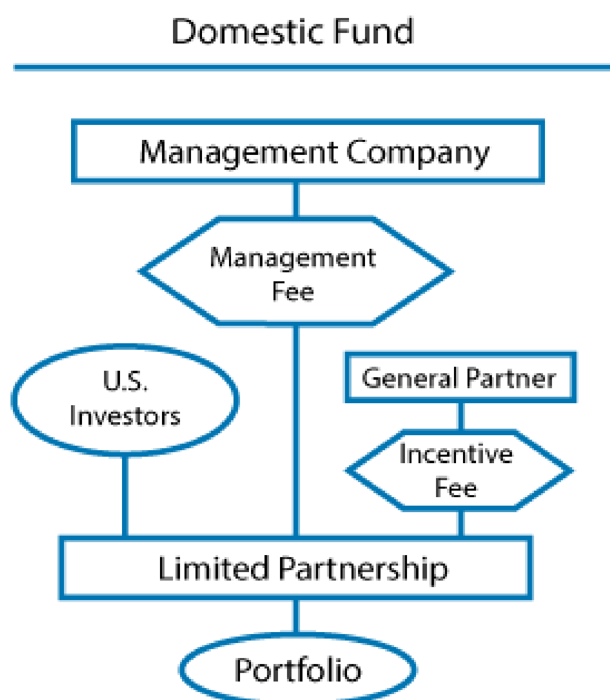


Figure 4: Structure of a Hedge fund partnership. (Mwellp.com, 2017)

3.8 Hedge Fund Corporate Governance

Corporate governance refers to the prearrangement of rules, practices, and procedures that govern how hedge funds are managed and controlled. It tends to be aimed at balancing the interests of the numerous parties involved. This includes the shareholders, customers, suppliers, sponsors and the government. Hence corporate governance rules provide a roadmap within which the company will be able to achieve its targets and monitor internal controls, performance evaluations and corporate disclosure (Kahan and Rock, 2007). In recent years, there has been a growing concern on how hedge funds are governed. During the financial crisis of 2008, many investors became upset when hedge fund managers stopped them from withdrawing their funds and yet continued charging them.

This prompted the application of previous legislation sections aimed at increasing transparency and accountability from fund managers. Hedge funds are exempt from many regulations. However, certain sections in the acts of 1933 & 1934 still apply to hedge funds. Other provisions regulate fund managers and their advisers by creating limits to the number and type of investors as well as barring public solicitation (Kaal and Oesterle, 2016). These acts contain anti-fraud rules and restrictions intended to protect investors from fraudulent practices. In recent years, the SEC has begun requiring hedge fund advisers who manage more than $25 million and with over fourteen investors to register under the Investment Advisers Act (Kahan and Rock, 2007). In addition to this, hedge fund managers who are managing more than $150 million worth of assets are mandated to compile and submit detailed financial reports.

3.9 Healthcare Funding Overview and Challenges

When it comes to funding successful healthcare initiatives, it is necessary to identify where there are gaps and risks in the ecosystem. Typically, larger more established companies are less of a risk to investors than smaller firms. New and innovative healthcare companies are racing to produce results that improve value for purchasers. Major leaps in health are being made due to the rapid progression of technology; biotechnology firms are seeing a substantial increase in venture capital resources being invested into their solutions. The success of a biotechnology company, as well as others in healthcare, is highly dependent on a multitude of factors including having an adequate and promising pipeline of new medicines and or solutions. There are high risks associated with biotechnology firms in that their progression faces increasingly costly challenges when looking to produce usable solutions. This is one example of the numerous barriers currently facing the healthcare sector.

One of the major difficulties in bringing medical solutions to market is the cost associated with FDA approval of a prescription drug. The cost of bringing a prescription drug to market is at a staggering all-time high and can cost an estimated 2.6 billion USD (Mullin, 2014). The price is due to the rigorous standards set in place by the FDA, and the costs associated with research and development required to meet the standards. The time it takes to bring a drug to market is on average more than ten years in length. A study published by the Tufts Center for the Study of Drug Development (CSDD) concluded that an estimated 312 million USD is spent on pre-approval development, and noted that the rising costs could be attributed to the complexity of undergoing the many phases of clinical trials (Mullin, 2014). Depicted in figure 5 is an illustration that shows the rise in costs associated developing a new drug over the past forty years.

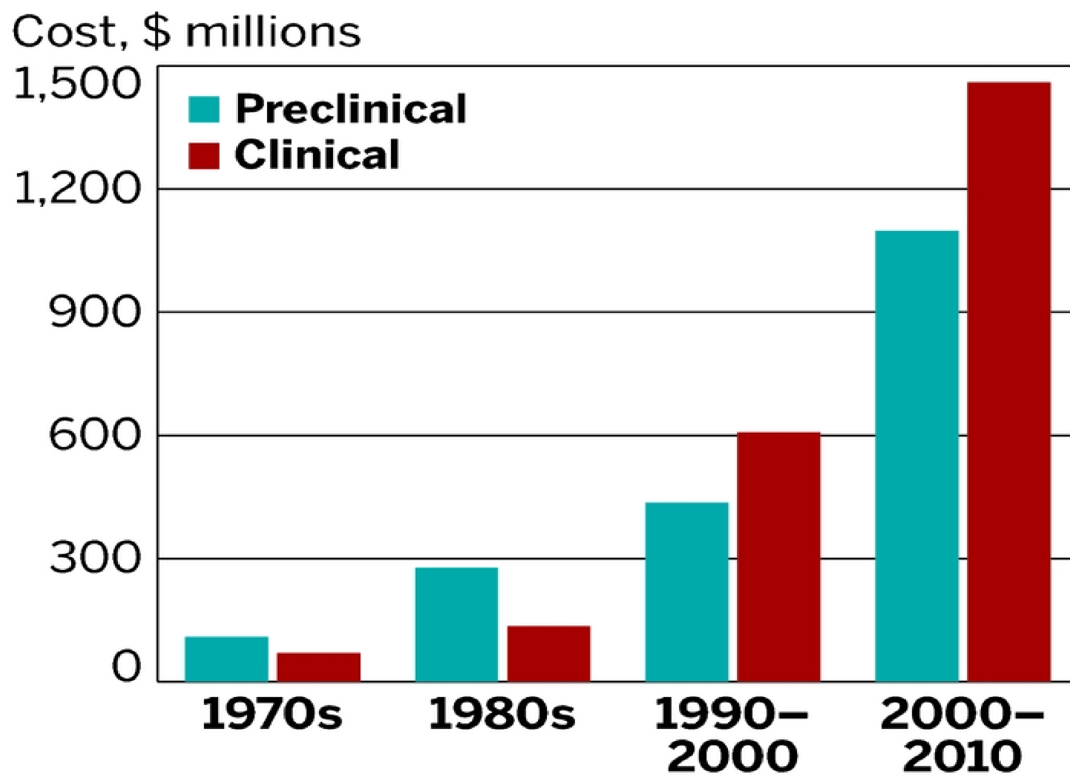


Figure 5. Rising cost of developing a new drug: The cost of developing a new drug has skyrocketed since the 1970s.(Tufts Center for the Study of Drug Development)

In addition to the increasing costs and time needed for bringing a new drug to market, the pharmaceutical industry also faces high levels of risk due to failure in the clinical trials. Clinical trials are one of the major costs associated with drug development. Table 1 shows the average R&D costs related to clinical trials in their respective domains over the critical phases.

Table 1. R&D costs by therapeutic category Source: Drug Information Journal
[a] The numbers in parentheses represent the rank in descending order.
[b] The cost for each phase assumes that a single trial (i.e., study) is conducted.

Therapeutic Area	Phase 1	Phase 2	Phase 3	All Phases Total	Review Phase	Phase 4	Total
Anti-Infective	$4.2M (5)	$14.2M (6)	$22.8M (5)	$41.2M (3)	$2.0M	$11.0M (12)	**$54.2M (10)**
Cardiovascular	$2.2M (9)	$7.0M (13)	$25.2M (3)	$34.4M (10)	$2.0M	$27.8M (4)	**$64.1M (6)**
Central Nervous System	$3.9M (6)	$13.9M (7)	$19.2M (7)	$37.0M (6)	$2.0M	$14.1M (11)	**$53.1M (11)**
Dermatology	$1.8M (10)	$8.9M (12)	$11.5M (13)	$22.2M (13)	$2.0M	$25.2M (7)	**$49.3M (12)**
Endocrine	$1.4M (12)	$12.1M (10)	$17.0M (9)	$30.5M (12)	$2.0M	$26.7M (6)	**$59.1M (7)**
Gastrointestinal	$2.4M (8)	$15.8M (4)	$14.5M (11)	$32.7M (11)	$2.0M	$21.8M (8)	**$56.4M (8)**
Genitourinary System	$3.1M (7)	$14.6M (5)	$17.5M (8)	$35.2M (8)	$2.0M	$6.8M (13)	**$44.0M (13)**
Hematology	$1.7M (11)	$19.6M (1)	$15.0M (10)	$36.3M (7)	$2.0M	$27.0M (5)	**$65.2M (5)**
Immunomodulation	$6.6M (1)	$16.0M (3)	$11.9M (12)	$34.5M (9)	$2.0M	$19.8M (9)	**$56.2M (9)**
Oncology	$4.5M (4)	$11.2M (11)	$22.1M (6)	$37.8M (5)	$2.0M	$38.9M (2)	**$78.6M (3)**
Ophthalmology	$5.3M (2)	$13.8M (8)	$30.7M (2)	$49.8M (2)	$2.0M	$17.6M (10)	**$69.4M (4)**
Pain and Anesthesia	$1.4M (13)	$17.0M (2)	$52.9M (1)	$71.3M (1)	$2.0M	$32.1M (3)	**$105.4M (2)**
Respiratory System	$5.2M (3)	$12.2M (9)	$23.1M (4)	$40.5M (4)	$2.0M	$72.9M (1)	**$115.3M (1)**

The challenges that come with seeking FDA approval play a significant role in the difficulties that face healthcare. Due to nature and challenges that face new drug development, the need for external funding is a constant one and is one that can significantly be reduced by an investment fund designed specifically to support the companies involved in such initiatives.

Existing literature supports the efficient use of vehicles funded by investment, and projects increased funding in the coming years. GIIN and J.P. Morgan published their 5th annual impact investor survey that provides a detailed overview of impact investments and performance. The study debated the two largest issues facing impact investments as "Lack of appropriate capital across the risk/return spectrum" and "Shortage of high-quality investment opportunities with a track record"(J.P. Morgan, 2015). The survey also

noted that the healthcare sector faced substantial difficulty attracting capital, and was said only to engage the investors with a deep commitment to impact.

The survey reinforces that an investment company aiming to support healthcare progress should first prioritize the financial performance of its portfolio to attract larger volumes of capital. Promoting the increase of capital towards a fund that invests in healthcare companies would certainly increase the potential for positive impacts in the health sector.

4. CONCLUSION

4.1 Viable Fund Components & Discussion

The components and discussion portion of this thesis are intended to deliver the prescription that constitutes the chosen viable funding model. This section of the thesis contains the bulk of what was found throughout the investigation and is considered to fulfill the research aim as well as answer the research questions. The research findings that make a case for a viable fund strategy are systematically outlined and discussed throughout this chapter. The components are prefaced with a brief description so that the reader may understand the relevance and context. Following the preface, an assertion by the author can be found regarding the chosen methodology. The assertion is accompanied by a brief explanation of how it supports the research objectives and answers the research questions.

Proposing a viable funding strategy includes attending to several different components that span across several spectrums. With all the relevant aspects considered by the author, the preferred fund vertical is appropriately one that can accommodate the undertaking of multiple strategies at different points in time so that the research objectives are preserved. This means that the portfolio and strategy of the fund will evolve naturally with the maturation of the markets, companies, and the fund itself. The research came to understand the importance of establishing focus points throughout the lifecycle of the fund. That for example the early stage of the said fund is one who's initial focus is on attracting the most capital possible by investing in companies with relatively short development cycles (1-3 years) likely to produce lucrative products or services that can either be acquired or brought to market. An example of the ideal partner would be A biotech company that produces a product or service that allows people to consume health care solutions similar to how they consume traditional goods and services. The evidence suggests that the companies ripest for this type of investment are venture-backed firms that improve the delivery and or convenience of medical solutions. Venture Capital firms often take these companies public and use IPO'S as an exit strategy when the company has reached a certain maturation point, making it a viable opportunity for mutual funds to step in.

Discussion of the elements that make up the viable fund model can be found in the following components:

Fund type: The fund type refers to the kind of investment vehicle chosen to undertake investments so that the investment objectives outlined by the founders are unencumbered when carried out by the fund manager. *The selected fund type* is an open-ended mutual fund that invests in equity stocks. An open-ended mutual fund was chosen due to the customizable structure for sector specific investments, and minimal regulatory limitation on investment solicitation when compared the likes of hedge funds. The open-ended mutual fund is the brand of an investment fund that is most suitable for a sector whose development is subject to political and regulatory affairs with partial dependence to other sectors. The mutual fund was also the fund type of choice given their ability to support small to large cap companies during different critical stages of development without limiting investor participation.

Investment Objectives: The desired outcome from undertaking investment is considered the investment objective. *The chosen targets* for this fund are capital appreciation and Income from equities. The primary objective is to attain appreciation in the value of deployed capital. The objective secondary to the first is to produce equity income.

Portfolio Composition: The composition of a portfolio Includes the class of assets to be invested in, as well as the sector of focus for directing capital. The portfolio can be seen as an echo of the underlying investment strategy *which in this particular case* is predicated on the inclusion of companies most likely to enhance the lifespan of its investors. The adoption criteria by which the portfolio is populated is outlined in the strategic investment policy.

Strategic investment policy: The policies behind the investment strategy include the rules and behaviors by which the fund engages with investments in general. The investment policy specifies the allocation and direction of investment resources across the board. *The chosen policy behind the investment strategy* is one that directs 80% of its capital towards the equity securities of listed companies whose primary focus is in the engagement of manufacturing, distribution, creation, research and development of biotechnological products, services, and or includes the acquisition of strong intellectual property. In addition to the inclusion of companies who focus on these objectives are; companies that directly or indirectly benefit from advances made in technology, changes in the political

landscape, and other factors that further stimulate the cycle of progress in healthcare. These companies roughly account for the remaining 20% of capital deployment.

The fund's allocation of resources is, however, subject to minor deviations at the discretion of the fund manager. One of the external elements that have influenced the scope of the strategic investment policy is the current political environment. Under the 2017 U.S. political landscape, investments in healthcare are likely to improve namely as a result of decreasing in business tax rates alongside the anticipation of more relaxed federal drug administration regulations on healthcare companies. A lower tax burden on healthcare companies should subsequently increase profits and reduce barriers to producing results. The reductions above would make it much easier for the participants involved to capture the value of research and development efforts.

Investment approach: The investment approach pertains to the style of investing being used by the fund manager. Growth and Value are the two main styles a fund manager may incorporate into the general strategy. Growth investing seeks to direct capital to companies with a strong proclivity towards monetary growth, justified by either a proven track record or by the potential to achieve high earnings growth. Value investing, on the other hand, tends to invest at a discounted rate towards undervalued companies on the stock market that possess strong qualities that have lasting value.

The chosen investment approach recommends that the approach should be a blend of both value and growth investing. The reason behind the blended investment approach is to accommodate for how advancements are made in healthcare, the role the current political/ regulatory landscape plays, and how the approach may elicit participation from investors of all kinds. To support healthcare firms of all types, the approach should not be limited to one style. Investments towards growth are appropriate in accommodating the initial considerations mentioned above. Additionally, the use of the growth supports the key fund objective of attracting the most capital. The value approach is also used because it can enable the manager to operate within a margin of safety by investing in firms with fundamentally sound characteristics at a reasonably discounted price.

Risk Approach: Managing risks associated with investment undertaking requires a systematic approach that addresses inherent risks as well as the sector and asset class specific

risks. The inherent risk profiles that require vigilance include overall volatility across the stock markets in response to adverse events that take place across economic, political, regulatory, and market spheres both foreign and domestic. Risks associated specifically with biotechnology and healthcare include inconsistent revenue patterns due to the high costs related to producing medical solutions. Mitigating risk in the health sector prompts the consideration of additional distinct elements and factors including patents, obsolescence, rapid changes in technology, and unexpected changes in governmental regulation, fierce competition, intellectual property contention, and clinical trial failures. To reduce investor exposure to risk, the fund manager should take pre-emptive measures that ensure consistent performance.

The risk policy of this fund should be highly considerate of the previously mentioned factors should they pose a threat. Momentary deviancies from normal investment activity are permitted if needed provided that they maintain alignment with the fund objective.

Fund Structure: The fund structure can be seen as the macro intellectual framework that influences the context by which decisions are made. The purpose of the selected open-ended mutual fund is to prioritize long-term capital appreciation while minimizing exposure to risk. Secondarily, the subjective goal of the fund is to support and include companies that are: likely to produce usable solutions, indicate undercapitalized opportunities, and operate in good faith towards healthcare. A successful fund manager should be able to detect positive patterns and anomalies in the market and to adjust his or her position accordingly without deviating away from the fund objectives. The nature of undertaking investments in the healthcare sector requires that a manager be acutely aware of the potential effects that external forces may bring, and capitalize on them at the appropriate time. This involves mapping out the positive or negative possible effects of sudden disruptions in the environment. Fortunately enough, the healthcare sector is anticipating a significant reduction in pressure from external parties. Technological advances are exponentially increasing the potential for medical breakthroughs across the world, and current U.S. regulatory/political affairs do not appear to pose an increase in burden to biotech firms.

Most of the components discussed in this chapter are interrelated. However, the components do not always share the same context, and this makes future adjustments to the

strategy more difficult. To meet the research objectives effectively, the components have been connected to the macro context by using a hybrid of three strategies. The resulting investment strategy is designed to support the amalgamation of multiple strategies, objectives, and priorities throughout time to meet the research aim.

The chosen strategies to integrate are the "Buy and Hold strategy," the "Performance weighting strategy," and the "Market timing strategy." These strategies are used in a timely manner meant to coincide with the value and growth based approach outlined earlier in the investment approach. The buy and hold strategy in conjunction with the performance weighting strategy indicates a hybrid strategy meant to hold long-term positions on large cap biotechnology or pharmaceutical firms. The presupposition of the buying and holding strategy is predicated on the notion of continual market growth over time. The probability for growth in the long term is more likely than not, and so holding long term positions have a decent likelihood of earning stable returns. Performance weighting indicates that the profits from investment activity into large cap biotech firms is reinvested into another underperforming portfolio, this is called rebalancing. Using the first combination is to ensure stability within the fund as well as to direct long-term support in the healthcare sector.

The amount invested in large cap firms proportionally correlates to the risk level associated with the second strategy, the "Market timing strategy" which is used to invest small cap companies in various subsectors within the healthcare industry. The market timing strategy is a permutation of the value investment approach in that it is used to invest in smaller high-potential companies that are undervalued or with low market valuations when compared to the gross national product thereby indicating higher long-term returns and satisfying investment objectives. The market timing strategy is not based on the best time to invest in the entire market, but rather it has been modified by the author to communicate its utility towards the optimal time to invest based on valuation also known as valuation timing.

While acknowledging the limitations of this study, the research regarding funding types was restricted to mutual and hedge funds. Publicly listed healthcare companies were included in the study while privately held healthcare companies were not. It would be in-

sightful to research the differences in strengths and weaknesses between public and private healthcare firms. Also, if the research were to continue; it would explore the relationship between healthcare advancement and the funding of medical research in greater detail.

5. REFERENCES

Carter, A.J. and Nguyen, C.N., 2012. *A comparison of cancer burden and research spending reveals discrepancies in the distribution of research funding*. BMC public health, 12(1), p.526.

DiMasi, J.A., Grabowski, H.G. and Vernon, J., 2004. *R&D costs and returns by therapeutic category*. Drug Information Journal, 38(3), pp.211-223.

Haslem, J.A., 2015. *Mutual Funds: Risk and Performance Analysis for Decision Making*.

Ineichen, A.M., 2002. *Absolute returns: The risk and opportunities of hedge fund investing* (Vol. 195). John Wiley & Sons.

Investment Company Institute (US), 2015. *Investment Company Fact Book*. Investment Company Institute.

Investment Company Institute (US), 2016. *Investment Company Fact Book*. Investment Company Institute.

Kaal, W.A. and Oesterle, D.A., 2016. *The History of Hedge Fund Regulation in the United States.*

Kahan, M. and Rock, E.B., 2007. *Hedge funds in corporate governance and corporate control*. University of Pennsylvania Law Review, pp.1021-1093.

Liu, X. and Mello, A.S., 2011. *The fragile capital structure of hedge funds and the limits to arbitrage. Journal of Financial Economics*, 102(3), pp.491-506.

Martin, A.B., Hartman, M., Benson, J., Catlin, A. and National Health Expenditure Accounts Team, 2016. *National health spending in 2014: faster growth driven by coverage expansion and prescription drug spending*. Health Affairs, 35(1), pp.150-160.

Managed Funds Association -- MFA. (2017). *Hedge Fund Basics* - Managed Funds Association - MFA. [online] Available at: https://www.managedfunds.org/hedge-fund-investors/ [Accessed 8 Mar. 2017].

Morgan, J.P., 2010. *Impact Investments: An emerging asset class*. Global Research

Mullin, R. (2014). *Tufts Study Finds Big Rise in Cost of Drug Development* | Chemical & Engineering News. [online] Cen.acs.org. Available at: http://cen.acs.org/articles/92/web/2014/11/Tufts-Study-Finds-Big-Rise.html [Accessed 1 Apr. 2017].

Nichols, H. (2015). *The top 10 leading causes of death in the United States*. [online] Medical News Today. Available at: http://www.medicalnewstoday.com/articles/282929.php [Accessed 18 Apr. 2016].

Park, H., 2015. *Emerging market hedge funds in the United States*. Emerging Markets Review, 22, pp.25-42.

Saltuk, Y., Idrissi, A.E., Bouri, A., Mudaliar, A. and Schiff, H., 2015. *Eyes on the horizon: The impact investor survey*. GIIN & JP Morgan, New York.

Mwellp.com. (2017). *Structuring a Hedge Fund: Which Option is Right for You? | Margolin, Winer & Evens LLP*. [online] Available at: http://www.mwellp.com/news/2013/10/structuring-a-hedge-fund-which-option-is-right-for-you/ [Accessed 2 Apr. 2017].

Undsci.berkeley.edu. (2016). *Understanding Science 101*: Contents. [online] Available at: http://undsci.berkeley.edu/article/0_0_0/us101contents_01 [Accessed 18 Apr. 2016].

Vanderbyl, S. and Kobelak, S., 2007. *Critical success factors for the biotechnology industry in Canada. Journal of Commercial Biotechnology*, 13(2), pp.68-77