



Returns of active vs. passive strategies of portfolio management: A systematic review

Igor Beslin

About the Author

Igor Beslin completed the Banking, Finance and Compliance Master Program at Lauder Business School. He graduated in 2019. This working paper corresponds to the excellent master thesis by Igor Beslin. The supervisor was Dr. Donald Baillie.

The LBS Working Paper Series

The LBS Working Paper Series “LBS Working Papers” aims at presenting applied research completed by LBS faculty, outstanding graduates and partners. Topics include subjects taught and researched at LBS’s degree programs (1) International Business Administration, (2) International Management and (3) Leadership and Banking, Finance and Compliance. Successful master graduates will be invited to publish condensed versions of their theses.

This text may be downloaded only for personal research purposes. Additional reproduction for other purposes, whether in hard copies or electronically, requires the consent of the author(s), editor(s). If cited or quoted, reference should be made to the full name of the author(s), editor(s), the title, the working paper, or other series, the year and the publisher.

Editor: Christian Reiner, Christian.reiner@lbs.ac.at
Lauder Business School
Hofzeile 18-20, 1190, Vienna, Austria
www.lbs.ac.at



Degree program
Banking, Finance & Compliance
Code of the degree programme: 0573

Master Thesis

To obtain the academic degree:
Master of Arts in Business (MA)

Title of the Master Thesis:

Returns of active vs. passive strategies of portfolio management: A
systematic review

Submitted by:	Igor Beslin
Matriculation Number	1610734003
Cohort:	BFC16
Supervisor:	FH-Doz. Mag. Dr. Donald Baillie FRM

Awarding body:	Lauder Business School Hofzeile 18-20 1190 Wien Austria
----------------	--

Vienna, 12.11.2018

Statutory Declaration

I declare in lieu of an oath that I have written this master thesis by myself, and that I did not use other sources or resources than stated for its preparation. I declare that I have clearly indicated all direct and indirect quotations, and that this thesis has not been submitted elsewhere for examination purposes.

12.11.2018

Date

Utop Temur

Signature

Table of Contents

1	Introduction	6
1.1	Context and scope of the study	6
1.2	Purpose statement and research questions	10
1.3	Benefits and objectives of the thesis	10
2	Research Methodology	13
2.1	Data collection	13
2.1.1	Performance metrics	14
3	Literature review	18
3.1	Theoretical background	18
3.1.1	Anomalies	19
3.2	Research prior to the year 2000	23
3.2.1	Equity mutual funds	23
3.2.2	Bond mutual funds	25
4	Empirical findings	27
4.1	Mutual fund performance in developed markets	27
4.1.1	Equity mutual funds	28
4.1.2	Bond mutual funds	32
4.2	Mutual fund performance in recessions	35
4.3	Mutual fund performance in emerging markets	38
4.4	Hedge fund performance	44
4.4.1	Hedge fund performance before the Global Financial Crisis	48
4.4.2	Performance persistence in hedge funds	53
4.4.3	Hedge fund performance during and after GFC	55
4.5	Factor-based investing and smart beta	59
5	Conclusions, discussions and suggestions for further research.....	65
6	References.....	69

List of Tables and Figures

Figure 1: Flows into active and passive US equity funds from 2006 to 2017	1
Figure 2: Mutual Fund Expense Ratios Across Investment Objectives	3
Figure 3: Total Net Assets of Worldwide Regulated Open-End Funds	6
Figure 4: Total Net Assets of Worldwide Regulated Open-End Funds	22
Figure 5: Percentage of total net assets by fund type	23
Figure 6: Cumulative flows into bond mutual funds.....	27
Figure 7: Total AuM growth and projection by region	33
Figure 8: Total hedge fund AuM 1997-2016	40
Figure 9: Number of hedge funds from 1990 to 2005.....	43
Figure 10: Net asset flows of hedge funds before, during and after the GFC	52
Figure 11: Hedge fund performance vs. the S&P 500	53
Figure 12: Hedge fund asset flows 2010-2017	54
Figure 13: Growth of smart beta AuM	56

List of Abbreviations

EMH	Efficient Market Hypothesis
AuM	Assets under Management
US	United States
CAPM	Capital Asset Pricing Model
NYSE	New York Stock Exchange
P/E	Price-to-Earnings
P/B	Price-to-Book
APT	Arbitrage Pricing Theory
GFC	Global Financial Crisis
EM	Emerging Markets
CEE	Central and Eastern Europe
SEA	South-East Asia
MENA	Middle East and North Africa
BRIC	Brazil, Russia, India, China
HF	Hedge Fund
HNWI	High Net-Worth Individual
FoF	Fund of Funds
EMHF	Emerging Market Hedge Fund
ETF	Exchange-Traded Fund
SB	Smart Beta

Abstract

The goal of this thesis is to analyze and evaluate existing literature in order to answer the question when, if ever, active portfolio management is superior to passive. All the primary active investment vehicles investing in various asset classes, geographical markets and in different economic conditions are covered. The results show most active investment strategies underperform the market in a risk-adjusted basis. Therefore, the optimal strategy for most investors is to primarily invest in a low-cost passively managed index fund. However, evidence is found that adding an emerging market and/or hedge fund component to a predominantly passive portfolio provides diversification benefits and improves the risk/return profile.

1 Introduction

1.1 Context and scope of the study

Over the past decade, a distinct trend could be observed in the asset management industry. Passively managed ETFs and index-linked funds have received steady capital inflows, while at the same time actively managed mutual funds and hedge funds are facing

Figure 1. Funds into active and passive funds

outflows and critique over poor performance and high fees.

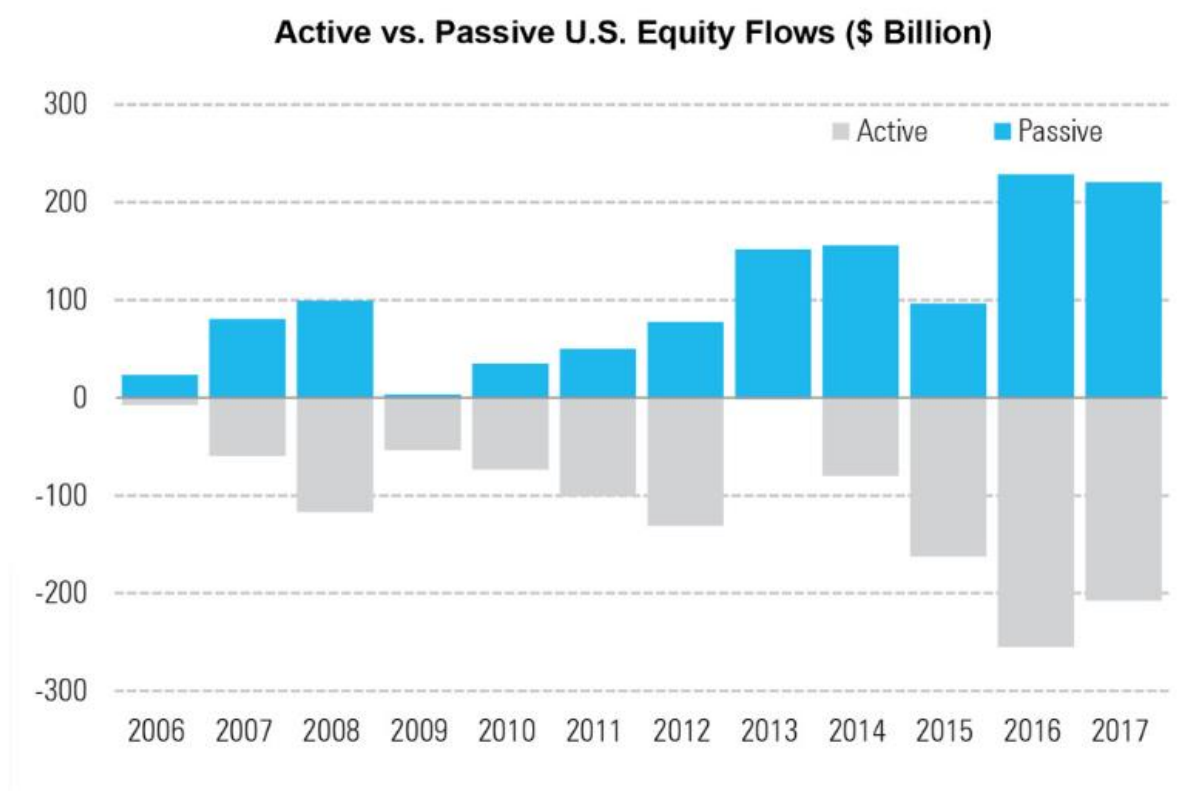


Figure 1: Flows into active and passive US equity funds from 2006 to 2017 (Boyce, 2018)

Globally, passive funds managed about 20% of all investment fund assets as of June 2017, up from 8% a decade earlier. The sharp rise of passive investing is most prominent in U.S. equity markets, where passive funds now represent around 43% of total fund assets. (Sushko & Turner, 2018, p. 114). Although still present, the rise in popularity has been less pronounced in the bond market. This is most likely due to bonds being less liquid than stocks, as well as difficulties in constructing and tracking fixed-income indices.

Retail investors, in particular, are increasingly abandoning their hopes of “beating the market”, or choosing managers to do it for them, and are instead switching to passive

strategies. The word “passive” in this context refers to buy-and-hold strategies, where investors would most commonly invest in a broad market index and hold that position for a long period of time. This approach has a theoretical background in the Efficient Market Hypothesis established by Eugene Fama. The EMH states that an efficient market is “A market in which prices always “fully reflect” available information” , and any new information is quickly, almost instantly, reflected in the price (Fama, 1970, p. 383). Broadly speaking, passive investors believe the market is highly, almost perfectly, efficient. Consequently, it is not possible to consistently outperform the market, and therefore holding the market portfolio and achieving the “beta” is an optimal strategy. It is important to note that proponents of passive investing do not dismiss the possibility that some market participants are able to outperform the market in the short and medium term; instead, they argue that, *on average*, active managers cannot beat the market. Furthermore, any outperformance is more likely to occur as a result of luck, rather than skill, making it impossible to guess which managers will be successful in the future.

On the other hand, proponents of active investing argue that inefficiencies in the market exist, and that they can be exploited to achieve a higher return. They insist managers with a proper skillset can consistently achieve abnormal returns or “alpha”, by using technical and fundamental analysis, forecasts and their own judgment. One of the key considerations in the active vs. passive debate is the impact of fees on the returns investors achieve. As a rule of thumb, active portfolio management incurs higher fees, both in the form of a management fee - usually a flat percentage of the total AuM, and a performance fee, which is a percentage of realized profits. These fees are used to fund the manager’s costs of running the fund, as well as compensation for the managers themselves. Apart from this, active management also incurs higher transaction costs, as active managers trade in and out of positions more often in their pursuit to find over- and undervalued securities. By contrast, passive funds charge significantly lower fees due to the fact that they incur lower costs. These funds are most commonly set up to passively track a specified benchmark, which removes the need for a professional manager to analyze and evaluate market conditions and individual securities and make decisions based on them. Therefore, potential investors are faced with a decision of investing either in a passive fund, which will only earn an average return at lower cost, or an active fund, which will incur higher costs but may deliver a return higher than the market average. As the following chapters will show, the literature shows strong evidence a large number of fund managers are able to consistently outperform the market measured by gross returns. However, when fees are taken into account, this is often no longer the case. These

findings indicate that there could be managers who are skilled enough to beat the market, but the excess value they provide is insufficient to cover the higher costs they incur. Active investing is in itself a zero-sum game. For every dollar that outperforms the market, there must be an equal amount of dollars that underperforms. That means that, on average, measured before fees, performance of all active investors will equal the overall performance of the market (Fama & French, 2010, p. 1915). This market performance, or average return, is what is by definition earned by passive investors. That is why the “burden of proof” falls on

Figure 2. Mutual fund expense ratios

active managers – they have to prove they possess the skill to consistently outperform their peers, at least in the amount of the fees they charge, in order to be considered superior compared to passive buy-and-hold strategies.

Investment objective	10th percentile	Median	90th percentile	Asset-weighted average	Simple average
Equity mutual funds¹	0.66	1.18	2.00	0.59	1.25
Growth	0.70	1.14	1.95	0.73	1.21
Sector	0.76	1.33	2.13	0.76	1.37
Value	0.68	1.10	1.89	0.70	1.18
Blend	0.40	1.00	1.80	0.36	1.04
World	0.80	1.28	2.10	0.73	1.36
Hybrid mutual funds¹	0.65	1.15	1.98	0.70	1.26
Bond mutual funds¹	0.45	0.81	1.61	0.48	0.93
Investment grade	0.35	0.69	1.49	0.35	0.77
World	0.65	1.00	1.80	0.61	1.12
Government	0.29	0.74	1.60	0.40	0.82
High-yield	0.63	0.95	1.76	0.73	1.05
Municipal	0.48	0.77	1.57	0.51	0.90
Money market funds¹	0.17	0.40	0.66	0.25	0.40
<i>Memo:</i>					
Target date mutual funds²	0.36	0.77	1.49	0.44	0.85
Index equity mutual funds¹	0.06	0.33	1.53	0.09	0.61

Figure 2. Mutual fund expense ratios across investment objectives (Investment Company Institute, 2018)

There has already been an extensive amount of research on the topic of active vs. passive investing. This includes both theoretical - testing whether the efficient market hypothesis holds, as well as empirical studies, which compare the actual realized returns of these two strategies. However, a great majority of these studies is limited in scope, can be

prone to sample and time biases, and often use different metrics to compare performance. For instance, Nguyen & Scholar (2010), compare the performance of US equity mutual funds from 1990 to 2009, in relation to a benchmark. This study can only be used as a body of evidence in order to reach a conclusion about the viability of active investing in specifically US equity mutual funds in the aforementioned time period. It does not, however, provide any insight into the performance of active management in other markets, asset classes or time periods.

Starting with Jensen (1968), most research has shown that mutual fund managers are, on average, not able to beat the market in developed economies, and if they are, they are unlikely to be able to repeat the same performance in future periods (Fama & French, 2010) (Carhart, 1997) (D. Blake, Caulfield, Ioannidis, & Tonks, 2017). However, proponents of active investing argue that abnormal returns are possible in specific market conditions, such as recessions, or in less developed and less liquid markets (Kremnitzer, 2012) (Risso, 2009). Furthermore, hedge funds and smart beta strategies offer alternatives to mutual funds in active investment vehicles. Performance persistence is also a crucial consideration when examining the performance of active investing. Even if an average mutual funds underperforms the market on a net-of-fee basis, investors can still achieve excess returns if positive future performance can be predicted. The purpose of this thesis is to conduct an exhaustive systematic review on the topic of how the returns of active portfolio management compare to those of the passive buy-and-hold approach. The aim is to include a great variety of active investing strategies, periods of economic expansion as well as recession, and different geographical markets in order to reach a conclusion.

This thesis will focus on the time period from the year 2000 onwards. The rationale behind this decision is two-fold. Firstly, this period covers the “dot com” crash of 2000 and the subsequent recession, the bull market that followed until the 2008 global financial crisis, as well as the growth period after it which lasts until this day. This time span includes two periods of economic downturn as well as two periods of growth, which can be used to properly assess performance during different market conditions. Secondly, some academics and practitioners argue that with technological advances, accessibility, and better financial education, capital markets have become more efficient over time (Barras, Scaillet, & Wermers, 2010, p. 200). On the other hand, faced with critique over high costs, many active investment vehicles have recently started decreasing their fees, making it easier for managers to outperform on an after-cost basis. By focusing on the time period from the year 2000, it is ensured that the findings are contemporary and relevant to both researchers and practitioners

at the present time. Nevertheless, it is critically important to consider the vast amount of literature on this topic created in the previous century. To start with, The Efficient Market Hypothesis developed by Eugene Fama in the 1960s serves as a theoretical basis for passive investing. There have been countless studies that have followed up on Fama's theorem, both confirming it as well as discrediting it. Furthermore, it would be a mistake to simply disregard all empirical research done before the year 2000, since it provides the foundation on which contemporary studies are based on. For the above reasons, a separate chapter will be devoted to a more in-depth analysis of the literature on this topic before the turn of the century.

1.2 Purpose statement and research questions

The purpose statement of the thesis is the following:

This thesis aims to compare the returns between active and passive strategies of portfolio management across different asset classes, geographical regions market conditions, focusing on the time period since the turn of the century.

Similarly, the research questions the thesis aims to answer are:

Since the year 2000, how have returns of active portfolio management strategies compared to passive ones

- a) across different asset classes and strategies of active management*
- b) in periods of economic expansions as well as recessions*
- c) in developed and emerging markets?*

1.3 Benefits and objectives of the thesis

After a short downturn due to the Global Financial Crisis, the asset management

Figure 3. Total net assets of mutual funds

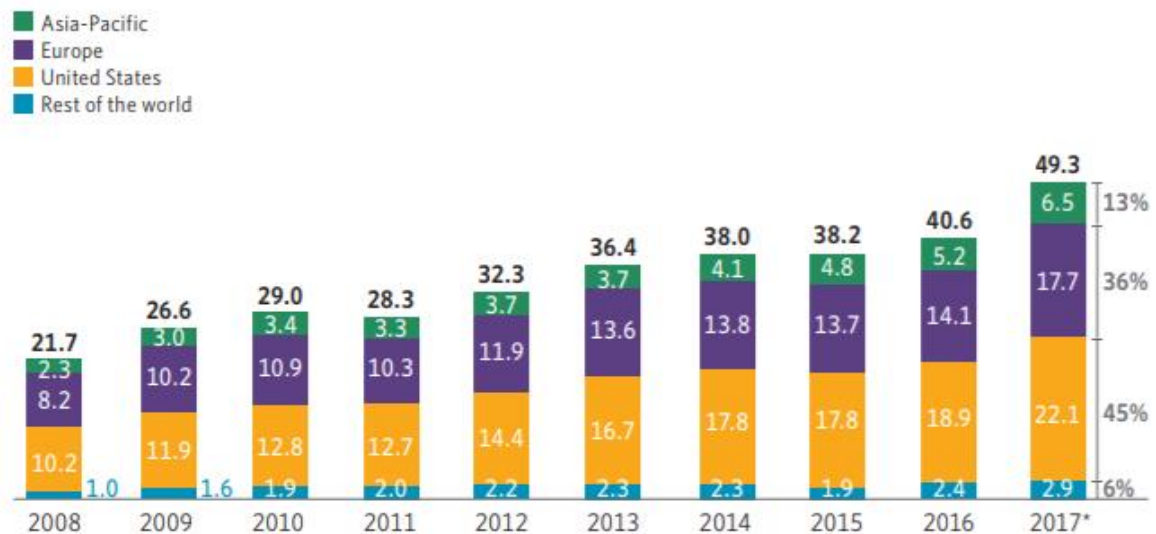


Figure 3. Total net assets of worldwide regulated open-end funds (Investment Company Institute, 2018)

industry is once again growing at a rapid rate. Worldwide AuM totaled to about \$64 trillion in 2014 and is projected to increase to around \$101 trillion by 2020, which is a compounded yearly growth rate of nearly 6% (PwC, 2014, p. 7).

Needless to say, all new investors, as well as current ones, have a choice to make regarding which investing strategies they wish to utilize. They can either choose a passive, buy-and-hold strategy, or try to actively manage their portfolio, either personally or through a professional manager. It is therefore crucial for them to have the relevant information about the empirical performance of these strategies before making a decision. However, as previously mentioned, primary studies on this topic are limited in scope, usually only focusing on one country, one asset class, in a specific time period. An investor considering investing in different asset classes, market conditions and geographical regions would therefore be required to consider an overwhelming amount of literature in order to form an educated opinion. Therefore, this thesis aims to conduct a systematic review of this literature and provide potential investors with a summary on when, if ever, active portfolio management is superior to passive.

As students of banking and finance, this topic is of great importance to myself and my colleagues, both from an academic and a practical point of view. As persons with financial education, we are more likely to engage in the financial markets, both for private and

professional purposes. Pension fund managers, private bankers and other wealth managers can also use the results of this research in order to maximize value for their clients. Finally, professional portfolio managers and investment management companies would be especially interested in the findings of this thesis, which can help them in adjusting their fee structure or focusing their marketing efforts.

The remainder of this thesis is organized as follows: chapter 2 covers the research methodology used, followed by chapter 3, which provides a theoretical background and an overview of the literature from the previous century. The reason research methodology is presented first is due to the fact that certain concepts and terms explained within it are crucial for proper understanding of the empirical research presented in the following sections. Chapter 4 summarizes and interprets relevant literature on the topic in order to answer the research questions. Finally, chapter 5 concludes.

2 Research Methodology

This thesis will be organized as a systematic review. A systematic review is “A review that aims to comp comprehensively identify all relevant studies to answer a particular question, and assesses the validity (or “soundness”) of each study, and taking this into account when reaching conclusions” (Petticrew & Roberts, 2006, p. 39). Systematic reviews have recently become more widespread due to the fact that the body of literature in many areas of scientific research has grown immensely over time. Therefore, there is a need to summarize all the relevant research in a concise and precise manner. Additionally, as opposed to a more traditional narrative review, which is prone to researcher biases, systematic reviews are detailed, comprehensive studies which use clearly defined strategies to identify and appraise all relevant studies on a topic (Uman, 2011, p. 57). They are more catered to practitioners, providing conclusions based on the available existing research.

Owing to the nature of literature reviews, this thesis’ method of data analysis will be secondary analysis. Secondary analysis is the use of data by researchers who were not responsible for its collection (Bryman & Bell, 2011, p. 313). Instead, the results and conclusions of a number of primary research studies will be used to draw conclusions with a goal to answer the aforementioned research questions. These conclusions, together with their implications and limitations, will be used as the basis of this thesis. The goal is to synthesize the findings of numerous narrow-scope studies in order to give an answer to when, if ever, active investing strategies outperform passive ones. Data used in aforementioned primary studies is primarily of quantitative nature, however it will be used to draw a descriptive conclusion, due to the nature of research questions this thesis aims to answer. The literature used in this systematic review will primarily consist of articles obtained from A-rated, peer-reviewed journals, which can be accessed over the Internet, as well as university libraries in Vienna.

2.1 Data collection

As previously mentioned, the largest advantage of a systematic review is that it uses unbiased, high-quality data, with a systematic approach to identifying relevant literature. In light of that, this thesis will follow a predetermined set of criteria in evaluating previous academic work. Some of these criteria include rejection of literature with sample selection bias, such as the survivorship bias, as well as other types of selection biases that might serve to advance the researcher’s agenda. Survivorship bias is the most notable data analysis flaw in

literature related to asset management and fund performance, and it can greatly skew the performance figures in favor of active management. It occurs when, in the process of evaluating the performance of investment vehicles such as mutual funds, only data from the survivors at the end of the period is used, excluding those that no longer exist (Vanguard, 2015, p. 1). This causes the average performance of funds to be skewed upwards, because the most common reason mutual funds and hedge funds close down is as a result of investor withdrawals due to poor performance. Therefore, if only the surviving funds at the end of the period are considered, it omits those which most likely had the worst performance, overstating the average performance of the remaining funds. This thesis will aim to primarily use literature which is free of survivorship bias. However, in some cases this is impossible - especially in early studies, due to the fact that many databases excluded data of funds that ceased to exist. However, if literature where the criteria of sample selection is unknown or where this flaw is present is used, it will be clearly stated.

Apart from survivorship bias, there are other sample selection flaws that might skew the results of a research. A phenomenon called cherry-picking occurs when only cases and data which advances the researcher's own agenda is used, while ignoring that which may contradict it. Even if the author does not have any pre-conceived convictions, various patterns and correlations between variables could arise in certain time periods simply due to chance. Literature on the topic of hedge fund performance is particularly susceptible to various sample selection flaws and biases, due to their obscure nature and voluntary reporting standards. For the above reasons, any individual study on, for instance, the performance of mutual funds cannot be used to draw conclusions about the viability of active investing in general. Systematic reviews, by contrast, gather and summarize all or most of the relevant literature on a particular topic in order to present a more complete and unbiased analysis on a particular topic.

2.1.1 Performance metrics

Apart from sample selection biases, there are other issues which need to be considered in the process of evaluating research on the performance of active management. One of the most significant ones are the models and metrics used for performance valuation in a particular study. To begin with, using absolute returns is an incorrect way of comparing the performance of assets or portfolios. Economic theory states that by assuming higher risk, investors can expect higher average returns on their investments. Therefore, an asset with a higher return at higher risk is not necessarily a better investment option than an asset with

lower return at lower risk. Consequently, the only way to accurately compare these two assets is by using risk-adjusted metrics.

One of the simplest ways to compare risk-adjusted returns between assets is by using a Sharpe ratio. The Sharpe ratio measures the return of an asset in excess of the risk-free rate per unit of risk in the form of standard deviation (Brealey, Myers, & Allen, 2010, p. 191):

$$S_a = \frac{E[R_i - R_f]}{\sigma_i}$$

Where:

S_a = Sharpe ratio

R_i = Expected return on asset i

R_f = Return on the risk-free asset

σ_i = Standard deviation of asset i

Since the Sharpe ratio uses the standard deviation of asset returns as the measure of risk, it can be used to compare any two assets. This is its primary advantage; however, it comes at a price. Because standard deviation is a measure of total risk, it is impossible to know which part of it is systematic risk, as opposed to diversifiable idiosyncratic risk.

This problem can be fixed by using the Treynor ratio, which measures risk only in the form of market risk:

$$T_p = \frac{E[R_i - R_f]}{\beta_i}$$

Treynor' ratio is based on the widely-known Capital Asset Pricing Model (CAPM) developed by William Sharpe more than 50 years ago. In the CAPM, the differences between expected returns of two assets can be explained by a single factor – beta. Beta is a measure of market risk, or an asset's sensitivity to non-diversifiable risk. The reason idiosyncratic risk is not included in the model is because rational investors (which is one of the assumptions of the model) should not take on any diversifiable risk, and therefore should only be awarded for systematic risk (Sharpe, 1964, p. 441).

The CAPM formula can be written as (Brealey et al., 2010, p. 217):

$$R_i = R_f + \beta_{iM} (R_M - R_f)$$

Where:

R_i = Expected return on asset i

R_f = Return on the risk-free asset

β_{iM} = Beta as a measure of systematic risk

R_M = Return of the market portfolio

The term “market” is mostly a theoretical concept, which is why, in practice, a broad-based stock market index, such as the S&P 500 or the Russell 2000, is most commonly used. The inclusion of a market benchmark is a drawback of the Treynor ratio (as well as other models that rely on it) compared to the Sharpe ratio, as its use is limited when comparing assets or portfolios with different benchmarks.

Jensen (1968) used the CAPM to compare the performance of mutual funds in the years from 1945-1964. Since the CAPM is a normative model, Jensen added another variable, which would later become known as Jensen’s alpha, to measure the excess return of an asset over (or under) the expected return:

$$\alpha_J = R_i - [R_f + \beta_{iM} (R_M - R_f)]$$

Alpha is a portion of an asset’s or portfolio’s performance that cannot be explained by the assumed risk, and therefore represents a measure of a manager’s skill. If a fund’s alpha is positive, it means that the manager has achieved higher returns for the assumed risk compared to the benchmark. Jensen’s alpha is an absolute measure that can be used to rank funds or investments by performance, which is why it was the performance measurement of choice in a large number of studies thereafter. However, as mentioned in the previous chapter, further research on the topic suggested that market beta might not be the only factor that drives stock returns (Reinganum, 1981)(Basu, 1983)(Lakonishok, Shleifer, & Vishny, 1994). In fact, CAPM was only able to explain approximately 70% of portfolio returns with its single factor.

Fama & French (1992)(1993) using their own as well as previous research, concluded that two types of stocks seem to outperform the market, even after accounting for risk: value stocks and stocks with low market capitalization. They added these two factors to the CAPM to create the Fama-French three-factor stock pricing model (Brealey et al., 2010, p. 202):

$$R_i = \alpha + R_f + \beta_{iM} (R_M - R_f) + \beta_{SMB} \cdot SMB + \beta_{HML} \cdot HML$$

The two new factors, SMB (Small Minus Big) and HML (High Minus Low) capture the historic excess returns of small-cap over large companies and value over growth stocks. The authors claim their three-factor model explains at least 90% of portfolio returns.

Carhart (1997) expanded on work by Fama and French by adding a fourth factor, momentum. He follows up on research by Jegadeesh & Titman (1993) and others that show that, at least in the short term, previous winners will remain winners, while previous losers will remain losers. Adding this effect provided sufficiently high explanatory power when added to the three-factor model, creating the Carhart four-factor asset pricing model (Carhart, 1997, p. 61):

$$R_i = \alpha + R_f + \beta_{iM} (R_M - R_f) + \beta_{SMB} \cdot SMB + \beta_{HML} \cdot HML + \beta_{MOM} \cdot MOM$$

Carhart's four factor model is one of the most commonly used models to measure and compare stock fund performance in contemporary studies. Previously described single- and multi-factor models can also be applied to evaluating the performance of bond portfolios. The factors in those models are usually in the form of various government, mortgage-backed, corporate, high-yield and investment grade indexes, as well as factors such as default spreads.

3 Literature review

The literature review will be divided into two parts. In the first part, the theoretical background of the discussion will be laid out, with a focus on the Efficient Market Hypothesis, as well as its proponents and detractors. Even though empirical studies comparing the returns between active and passive portfolio management predate the actual formulation of the EMH, it is nevertheless of great importance to further explore this theorem and its implications, as the assumption that markets are (almost) fully efficient serves as a basis on which proponents of passive investing base their arguments on. Conversely, research on inefficiencies of the market, known as anomalies, will also be covered, as successful exploitation of these inefficiencies leads to higher risk-adjusted returns pursued by active investors.

The second part of the literature review will be devoted to analyzing empirical research prior to the year 2000. As previously mentioned, some academics and practitioners argue that markets have become more efficient over time, implying these studies cannot necessarily be used to draw conclusions and recommendations about the present day. Nonetheless, they are often the starting point of more contemporary research, help identify gaps in the literature, mistakes in sampling and data analysis, and show how the thought regarding this topic has developed over time.

3.1 Theoretical background

According to Fama (1970), “A market in which prices always “fully reflect” available information” (p. 384), is considered efficient. That implies that price changes, and consequently, returns, are independent from previous prices. Under the assumptions that information is free and readily accessible, and that any new information is instantly reflected in a security’s price, any change in price will occur only as a result of new information being distributed and will be independent from the price changes in the past. Since news are by nature unpredictable and random, so are the resulting price changes. This idea is referred to as the “random walk” in financial literature (Malkiel, 2003, p. 3).

Fama divided market efficiency into three levels. Weak-form market efficiency states that prices fully reflect all historical information, therefore the only cause of price changes is the release of new information. Semi-strong market efficiency implies prices fully reflect all available public information (such as annual reports, new security issues, other news) and that any such new information is practically immediately reflected on the price. Finally, strong-

form market efficiency suggests that all information, including non-public information, is reflected in the security's price (Fama, 1970, p. 388).

It is hard to argue for strong-form market efficiency, that investors cannot achieve higher returns even by possessing monopolistic access to some information. Fama himself, in his work 1970 paper establishing the EMH, does not expect this model to be a representation of reality. What Fama, Malkiel, and other proponents of passive investing argue is that capital markets are semi-strong efficient, that prices fully reflect all available *public* information. What this means in practice, is that neither technical analysis - the analysis of historical information such as prices, patterns and trading volumes, nor fundamental analysis - the analysis of company financial reports, assets, and news announcements, would enable investors to achieve greater returns than those of the market (Malkiel, 2003, p. 3).

3.1.1 Anomalies

By contrast, other economists and researchers have discovered and documented certain psychological and behavioral elements which imply that future stock prices are at least somewhat predictable. These deviations from the EMH are called anomalies, and proponents of active investing argue they can be used to achieve higher return without assuming higher risk. These anomalies go against either weak-form or semi-strong form of market efficiency, and they will further be explored in the following chapter.

3.1.1.1 Anomalies against weak form market efficiency

One of the most well-known anomalies is the seasonality of stock returns. More specifically, researchers have found consistently higher average returns in January. This gave rise to the term “January effect” or “turn of the year effect” and was first documented by Rozeff & Kinney (1976), who have found seasonality in monthly stock returns in US markets, in a 70-year period from 1904-1974. Similar results have been found by Gultekin & Gultekin (1983) and Agrawal & Tandon (1994), who have all found evidence of higher average return in January, in most industrialized countries. The most common explanation for the January effect is tax-related. Investors sell securities that have experienced capital losses, in order to offset the capital gain tax liability. Then, after the turn of the year, they re-enter the market pushing the prices higher (Reinganum, 1983). The effect is negatively correlated with stock size, which means it is more pronounced for smaller cap, less liquid stocks (Keim, 1983).

However, newer literature indicates the January effect might have disappeared over time. Szakmary & Kiefer (2004), find no evidence of abnormal returns in January after the

year 1993. Additionally, Bhardwaj & Brooks (1992) find that transaction costs, which are especially high for small-cap stocks, will eliminate most of the profits from any investment strategy attempting to capitalize on the turn of the year effect.

Other than the January effect, there have been other calendar effects which have challenged the weak-form EMH. The so-called “Monday effect” documented by Cross (1973), French (1980), Lakonishok & Levi (1985) and others, indicates that mean returns in US markets are lower on Mondays and higher on Fridays. However, Maroto Santana et al. (2006) do not find any significant day-of-the-week effects in the European markets from 1977-2004. Jaffe & Westerfield (1985) find that, in contrast to the US, the lowest average returns in Japanese and Australian equity markets occurred on Tuesdays.

A similar pattern can be observed for the “turn-of-the-month” effect. Ariel (1987) found that in the period from 1963-1981 in the US, mean returns are higher on the last day of the month, as well as the first three days of the following month. Lakonishok & Smidt (1988) find the same result in the 90-year period from 1897-1986 in the final trading day of the month and the first four trading days of the next month. Various researchers have obtained similar results in different markets, time horizons and days around the turn of the month (Agrawal & Tandon, 1994) (McConnell & Wei, 2008).

However, as Malkiel (2003) notes in his defense of the EMH, many of the anomalies and predictable patterns found are not robust and dependable in different sample periods, but were instead discovered simply as a result of data mining. With the amount of financial data and analysis tools available today, it is inevitable researchers will discover some significant correlations between variables in the datasets, which, ultimately, prove to be spurious. He concludes that “Given enough time and massaging of data series, it is possible to tease almost any pattern out of most datasets” (Malkiel, 2003, p. 23). Therefore, investors should exercise caution when considering using any of these calendar effects as a basis for their investment strategy. Furthermore, if any of these predictable patterns do appear, they will quickly be arbitrated away as soon as they are published in financial literature (Malkiel, 2003, p. 22). For example, if research shows stocks exhibit higher returns in the first five days of January, investors will rush to buy in the last days of December and sell on January 5th, effectively annulling the effect.

3.1.1.2 Anomalies against semi-strong form market efficiency

Semi-strong form market efficiency implies that all available public information is included in a stock’s price and that any new information is quickly, almost instantly, absorbed

and reflected on the price (Fama, 1970, p. 383). Various economists and researchers have challenged both of these statements. They argue that there are certain factors and information that is not included, or wrongly interpreted, by investors in pricing stocks, and that by finding them, one can achieve higher risk-adjusted returns. Similarly, when new information is released, skeptics doubt that the market can quickly and accurately absorb it in order to form a new equilibrium price.

The most common example of the latter is the theory of overreaction and underreaction to company news, such as earnings announcement, stocks splits, dividend payout, mergers and acquisitions and similar. In one of the first papers on this topic, DeBondt & Thaler (1985) find that previous winners tend to underperform in the future and vice versa, due to the fact that investors overreact to past information. Chopra et al. (1992) find the same results, both long-term as well as in short windows around earnings announcements. The findings are further confirmed by Lehmann (1990) who finds that the previous week's losers and the next week's winners and vice versa, and also attributes this effect to investor overreaction. This literature implies that both long-term and short-term abnormal profits are possible by applying a contrarian strategy, of buying previous losers and selling previous winners.

However, there is a large number of studies that have found an opposite effect, that markets underreact to new information. Jegadeesh & Titman (1993) find that, from 1965-1989, buying the previous six months' winners and selling the previous six months' losers and holding them for the following six months, yields significant excess return. Similar results have been found by other researchers (Sinha, 2016). Indeed, Fama (1998, p. 283) concludes that overreaction to news occurs at similar frequency as underreaction, and post-event returns are as likely to follow pre-event ones as they are to reverse them. Additionally, as Malkiel (2003, p. 7) points out, it is crucial to understand the difference between statistical and economic significance. Exploiting patterns can produce positive returns only if the magnitude of the effects outweighs the trading costs included in implementing such strategies. Given the high trading volume and, consequently, transaction costs that these momentum and contrarian strategies employ, it is unlikely that they would outperform a simple buy-and-hold strategy. Indeed, research by Odean (1999) and Lesmond, Schill, & Zhou (2004) confirm this stance.

Another anomaly which challenges semi-strong form market efficiency is the so-called small firm effect. It holds that smaller firms, measured by market capitalization, outperform larger ones. This effect was first documented by Banz (1981) where he found that in the 1936-

1975 period on the NYSE, smaller capitalization firms had higher risk-adjusted average returns than larger firms. Keim (1983, p. 13) confirms these findings, adding that nearly half of the size effect over the period 1963-1979 can be explained by abnormal returns in the month of January, linking the previously explained January effect with the small firm effect. Research by Reinganum (1981) and Brown, Kleidon, & Marsh (1983) further supports the existence of the small firm effect. Interestingly, however, the authors do not consider these findings as evidence against the EMH, but rather as shortcomings of the CAPM model. All the previously mentioned studies used CAPM's beta as the only measure of risk. However, as Fama & French (1992, p. 428) point out, during the 1963-1990 period the relationship between beta and return was flat, not upward sloping as the model would suggest. This implies there are other factors which help explain the expected return of stocks, in addition to the one-factor model created by Sharpe. Indeed, Reinganum (1981) concludes that there "seem to be risk factors that are omitted from the CAPM as is evidenced by the persistence of "abnormal" returns for at least two years" (p.44). Furthermore, survivorship bias could have influenced the results of some research done on the topic of small-firm effect, as many of the databases only contain firms that have survived until the end of the period, not the ones that went bankrupt (Malkiel, 2003, p. 18)

There are also several studies which suggest that "value" stocks outperform "growth" stocks. The classification between value and growth is based on valuation multiples, usually price-to-earnings (P/E) ratio and price-to-book (P/B) ratio. Basu (1977) has found that from 1957-1971, stocks with lower P/E ratio have earned higher average risk-adjusted return than higher P/E stocks. Ball (1978) has demonstrated the same phenomenon, as has Basu (1983) a few years later, concluding that either " (i) the single-period capital asset pricing model (CAPM) has descriptive validity" or "(ii) security price behavior on the NYSE is consistent with market efficiency." (p.129). Jaffe, Keim, & Westerfield (1989) as well as Fama & French (1993) find that stocks with low P/B value provide higher returns than those with high P/B. Additionally, once this effect is accounted for, the P/E multiple does not offer any additional explanatory power for future returns. However, similarly to the previously described small-firm effect, these results challenge the semi-strong EMH only if the CAPM's beta is accepted as the only measure of risk. As Lakonishok, Shleifer, & Vishny (1994) point out, instead of invalidating the EMH, these previous studies may simply reveal that the CAPM does not capture all aspects of risk.

Indeed, further research on this topic will ultimately lead to the development of multi-factor models explained in the previous section, which include other risk factors in addition to

CAPM's beta. These models offer a far greater explanatory power of a stock's expected return and are used in empirical research to this day.

3.2 Research prior to the year 2000

In this section, literature concerning the real-world performance of active management prior to the year 2000 will be laid out. As previously mentioned, the statistical significance of certain market inefficiencies does not necessarily imply economic significance. In other words, these inefficiencies have to be sufficiently large in order for strategies based on these anomalies to be superior than a buy-and-hold approach, after transaction and other costs are included. For that reason, empirical studies are needed in order to properly assess the performance of active portfolio management before the turn of the century.

3.2.1 Equity mutual funds

Mutual funds are professionally-managed investment vehicles that collect money from a large number of investors and invest it in a portfolio of various assets, such as stocks and bonds. In most cases, investors' funds are invested in long-only portfolios with the goal to outperform a common market benchmark. In the year 2000, there were over 8000 mutual funds in the US with nearly \$7 trillion in assets, making them the most common active investment vehicle for investors (Statista, 2018).

Due to their prevalence in the asset management industry, it is not surprising mutual funds have captured the attention of the academic community early on. Over time, the performance of mutual funds would become one of the most researched topics in financial literature. The groundwork on this topic was laid out by Jensen (1968). In his landmark study, Jensen compared the performance of 115 mutual funds between 1945-1964 and found that, on average, mutual funds achieved lower returns than a simple buy-and-hold passive strategy. The average net-of-fees alpha was -1.1% per year, on a risk-adjusted basis. In fact, even after adding back all the expenses except brokerage fees, the alpha was still slightly negative at -0.4% per year. Furthermore, Jensen (1968) found that the number of mutual funds which were able to consistently outperform the market was lower than would be expected by random chance. Similarly, Henriksson (1984) examined the performance of 116 open-end mutual funds from February 1968 to June 1980 and found no evidence that mutual funds are able to successfully time the market. Ippolito (1989) tests 143 mutual funds from 1965-1984, a *de facto* continuation of Jensen's work. More importantly, Ippolito's sample is free of survivorship bias, as he notes that only 106 out of 143 funds have survived the entire period

(Ippolito, 1989, p. 4). Interestingly, net of all fees and expenses apart from load charges, mutual funds seemed to have earned positive alphas and outperformed passive index funds on a risk-adjusted basis. However, the alphas, even though positive, were not high enough to offset the average load charges in the mutual fund industry.

Wermers (2000) has done research on stock-level holdings of mutual funds from 1975-1994, in a sample free of survivorship bias. A more in-depth analysis such as this allows for separation of stock holdings, non-stock holdings such as bonds and cash, and expenses, and how they individually impact the net returns of a fund. Results show that the average fund held stocks that beat the market index by 1,3%, although the average net return was -1%. The difference of 2,3% is comprised out of 0.7% underperformance of non-stock holdings and 1.6% split between fees and transaction costs.

After a number of studies showing that, *on average*, the mutual fund industry is unable to outperform the market benchmark, researchers set out to identify whether there is evidence of persistence in mutual fund performance. Hendricks, Patel, & Zeckhauser (1993) focus their attention on no-load equity mutual funds investing in growth stocks from 1974-1988. They find evidence of performance persistence – a strategy of each quarter buying the best performers of the previous four quarters yields significantly higher results than an average mutual fund, although only marginally better than a market index. It is important to note the researchers do not find any evidence of persistent positive performance over longer time horizons. By contrast, sustained underperformers can be identified. Wermers (1997) also concludes that in the period from 1975-1994, buying the last year's highest decile performance funds outperforms an average fund by 3% on a pre-expense basis. Carhart (1997) further confirms this, showing last year's winners have higher-than-average expected returns next year. However, Carhart also points out that the persistence in mutual funds returns is not a result of manager stock-picking skill. Instead, it can be entirely explained by two factors: momentum in underlying stock returns and investment costs.

Malkiel (1995) stresses that the predictability of mutual funds returns is not consistent over time; although present in the 1970s, the effect largely disappears in the 1980s, especially later in the decade. Additionally, he concludes that the predictability of future returns does not necessarily translate into excess returns over the benchmark. Brown & Goetzmann (1995) confirm Malkiel's findings. They do find relative performance persistence inside the mutual fund universe, which means investors can use historical returns to predict future outperformance compared to an average mutual fund. However, in terms of earning excess

returns over a benchmark market index, the findings vary depending on the time period of the analysis.

3.2.2 Bond mutual funds

Even though the subject of mutual fund performance has been the focus of many studies over the previous century, almost all of the empirical work done on the topic before the 1990s has involved stock funds. However, as Blake, Elton, & Gruber (1993, p. 372) point out, in 1990 bond funds held 27,3% of all mutual fund assets in the US, compared to 10,1% in 1978. As the global debt market is multiple times bigger than the global stock market, the importance of research on bond mutual fund performance can hardly be overstated.

The previously mentioned work by Blake et al. (1993) represents the first study specifically focused on bond fund performance. The authors use two different samples over different time periods. The first sample is free of survivorship bias and includes 46 funds during a 10-year period between 1979-1988. The second sample consists of all funds that existed at the end of 1991. Since it excludes non-surviving funds, the second sample does suffer from survivorship bias. However, as the authors explain, this bias is less significant for bond funds due to their returns being less variable and volatile. Because of this, less bond funds merge or disappear compared to equity funds (Blake et al., 1993, p. 374). Blake et al. (1993) compare the performance to the return of 30-day T-bills, as well as various government, investment-grade and corporate bond indexes. The authors conclude that, overall, bond funds underperform the benchmark indexes by approximately the amount of fees charged. The results are comparable to those on equity funds (Ippolito, 1989)(Wermers, 2000). Additionally, the researchers found no predictability of future performance based on past performance in the bias-free sample. Some evidence of persistence is found in the second sample, although the authors conclude it could be due to the bias.

Elton, Gruber, & Blake (1995) conduct another study on bond mutual fund performance, this time using arbitrage pricing theory (APT) models. APT models use unanticipated changes in economic variables to explain security returns. The study covers a time period from 1980 to 1992, in sample which does, again, contain survivorship bias. Nevertheless, consistent with their previous research, the authors find that bond funds achieve lower returns than predicted by the APT models, by approximately the amount of fees charged.

This chapter provided a short overview of the empirical findings on mutual fund performance in the previous century. There was little evidence that showed mutual funds can

outperform a simple buy-and-hold strategy on a risk-adjusted, net-of-fees basis. There was some evidence of the “hot hands” phenomenon, that previous performance is indicative of future performance. However, the findings are sensitive to the time period in question, and there is little proof that following a momentum strategy of buying previous period’s winners will yield excess returns over a benchmark. This literature review has been focused on the US mutual fund universe and did not cover other developed countries or emerging markets. The reason for this is that the goal was not to present a comprehensive overview of previous century’s literature, but rather to provide an introduction and historical background to more contemporary studies. The following chapters of this thesis will go into great detail about the performance of active investing, both in developed and emerging markets. Similar rationale applies to hedge funds, smart beta funds and other types of active management tools. Although they have certainly existed, the hedge fund and smart beta industries were still in their early and developing stages in the 20th century. Therefore, they have been omitted from this literature review and will instead be covered in great detail in the following chapter.

4 Empirical findings

This chapter reviews more contemporary research on performance of active vs. passive portfolio management and represents the main part of the thesis. First, in section 4.1, performance of mutual funds in developed markets is analyzed, after a nearly unanimous conclusion that they were not able to beat the market in the latter half of the previous century. The following subchapter reviews how mutual funds have done in times of recession. Section 4.3 evaluates the literature on mutual fund performance in emerging markets, which arguably offer more opportunities to exploit market inefficiencies than developed markets. Section 4.4 explores hedge fund performance and complexities involved in evaluating it in great detail. Finally, chapter 4.5 is dedicated to smart beta and factor-based investment strategies.

4.1 Mutual fund performance in developed markets

In 1970, there were 361 mutual funds in the United States with approximately \$48 billion in assets. In 2017, these numbers were over 9300 funds with over \$18 trillion AuM

Figure 4. Total net assets of open-end funds

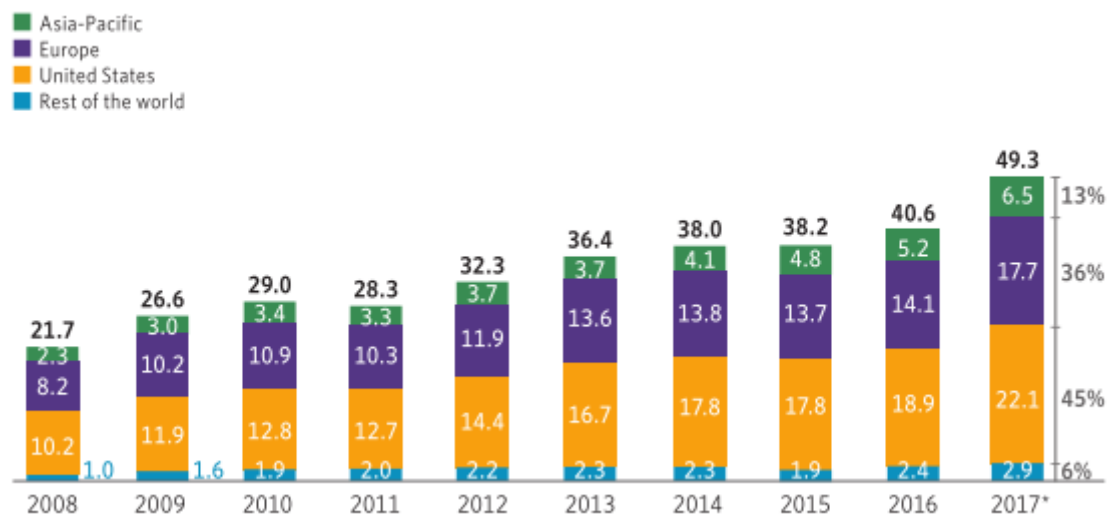


Figure 4. Total net assets of worldwide regulated open-end funds 2008-2017 (Investment Company Institute, 2018)

(Statista, 2018).

Since previous research has shown that an average mutual fund was not able to outperform a simple buy-and-hold strategy, and that there was little evidence of performance persistence in top performing funds, these statistics seem surprising. One possible explanation is that in recent times, fund managers have become more skilled and successful, meriting the dramatic increase in popularity. On the other hand, the case might be that investors are not

informed enough when making decisions on where to invest their savings. The following two subchapters will be dedicated to exploring the performance of equity and bond mutual funds in the U.S. and other developed markets.

4.1.1 Equity mutual funds

Equity funds are still by far the most common type of mutual fund in the world. As previously mentioned, the managers most commonly invest the fund's assets in long-only portfolios with the goal of outperforming a specified index. That makes comparing and ranking the performance of equity mutual funds relatively easy. As a result, and following the trend from the previous century, stock funds have received the largest amount of attention from the academic community in the recent years as well.

Figure 5. Total assets by fund type

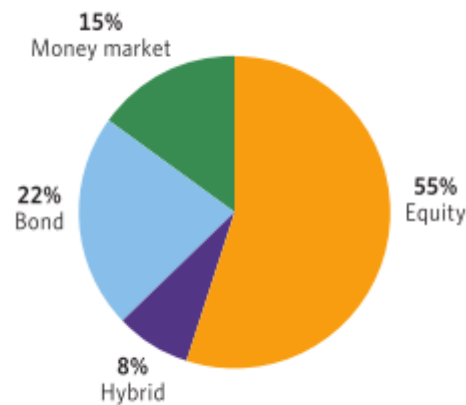


Figure 5. Percentage of total net assets by fund type

In a similar fashion to the hallmark study by Jensen (1968), Nguyen (2010) compares the performance of 3475 U.S. equity mutual funds from January 1990 to December 2009. The author places great emphasis on avoiding survivorship bias, thus including both surviving and dead funds in the aforementioned period. The time frame of the study includes the “dot com” crash in the early 2000s, the 2008 global financial crisis, as well as periods of economic growth before and between these recessions. This gives a representative picture of managers’ performance in both good and bad economic conditions. Nguyen (2010) finds that average net-of-fee alpha over the entire sample period is negative, which implies mutual funds are not able to provide excess risk-adjusted returns. As expected, the average alphas decline from the CAPM, over the 3-factor to the 4-factor model. Interestingly, measured gross-of-fees, the average annual alpha of all the funds is slightly positive. However, the abnormal returns are consumed by fees and expenses, making the net returns for investors inferior to passive alternatives. Fama & French (2010) confirm these findings on a relatively similar sample of

3156 US funds from 1984 to 2006, showing that in aggregate, mutual funds underperform on a net return basis by the amount of costs.

Barras et al. (2010) take a slightly different approach, separating funds into three categories: true zero-alpha, negative alpha and positive alpha. The managers of true zero-alpha funds do exhibit some stock-picking ability; however, the benefits are not realized by investors, and are instead consumed by fees. According to the authors, 75,4% of the funds in the population belong to this category. Unskilled or negative alpha, funds which provide negative gross returns comprise 24% of the sample, while true positive alpha, or funds with positive net-of-fee alphas, represent only 0.6% of the population, which is statistically indistinguishable from zero. Furthermore, Barras et al., 2010 (p. 181) observe a negative trend – the number of skilled funds decreased from 14,4% in 1990 to 0.6% in 2006, while the proportion of unskilled funds rose from 9,2% to 24%. These results indicate that the markets may have become more efficient over time.

Cuthbertson, Nitzsche, & O’Sullivan (2008) examine the performance of UK mutual funds and find that, similar to their US counterparts, an average fund is not able to beat the market index. However, the results do show that between 5% and 10% of UK mutual funds exhibit true stock picking ability which cannot be attributed to luck. Nevertheless, since a large majority of overall abnormal performance can be attributed to random chance, the authors conclude it would be very difficult for an investor to pick fund managers that demonstrate genuine skill and would therefore be better off investing in passive funds.

Perhaps somewhat surprisingly, there is little contemporary literature on the European mutual fund industry. The primary reasons for this are most likely the relative lack of development and reliance on the capital markets compared to the US, as well as due to the fact that the integration of European financial markets has largely occurred over the course of the last couple of decades. One of a few studies which examines European mutual fund performance on a larger scale was done by Vidal-García (2013). He examines a survivorship bias-free sample of 1050 actively managed mutual funds from the UK, France, Italy, Spain, Germany and Netherlands from 1988 to 2010. The results show that an average fund’s alpha is negative on a net return basis for all time horizons, which indicates European mutual funds are unable to provide sufficient excess return to cover their fees. Banegas, Gillen, Timmermann, & Wermers (2013) reach the same conclusion, finding the average 4-factor alpha to be -0.32% per year from 1988 to 2008. On the contrary, Otten & Bams (2002) examine 506 mutual funds from five different European countries which invest in domestic stocks, and find that an average fund slightly outperforms their respective benchmark. The

results are especially significant for small-cap funds, even after controlling for increased risk. The authors explain the difference between their results and literature focused on the US is most likely due to relatively smaller market share of domestic mutual funds in Europe - only 11%, compared to 30% in the US. If the sector grew larger relative to the market, the authors explain, it would become progressively harder to beat the benchmark because there would be more professional managers to compete against. Another possible explanation is that, since Otten & Bams observe a time period earlier than the one examined by Vidal-García and Banegas et al., European markets could have become more efficient over time, especially in countries where capital markets are not as developed.

The conclusion is nearly unanimous in academic literature; on average, mutual funds in developed markets are not able to outperform passive strategies benchmarked to a market index. However, the underperformance of an *average* fund does not necessarily mean that skilled managers who can consistently beat the market do not exist. Literature on performance persistence in the 1980s and 1990s has produced mixed results, with poor past performers exhibiting a much stronger tendency of continuing the trend compared to good performers. The remainder of this subchapter will focus on more contemporary literature on performance persistence of mutual funds.

In his previously mentioned work, Nguyen (2010) tests whether investors can achieve higher returns by buying previous winners and selling previous losers. He constructs two types of portfolios – one where the winners (losers) are classified as having a higher (lower) return than the average fund in the previous year, and another where they are classified as having a higher (lower) return than the market in the previous year. In both cases, the strategy of buying previous winners does not appear to achieve substantial returns neither in the short-run or the long-run. Cuthbertson et al. (2008) confirm these results on their sample of UK funds, noting that while positive past performance does not persist, past negative performance does. The most recent report by S&P Dow Jones Indices on the persistence of mutual fund performance states that “Out of 568 domestic equity mutual funds that were in the top quartile as of March 2015, only 1.94% managed to stay in the top quartile at the end of March 2017”(S&P Dow Jones Indices, 2017, p. 1). Likewise, only approximately 19% of funds that were in the top half, remained there after a period of three years. Other researchers, however, do find evidence of persistence in performance. Bollen & Busse (2005) rank funds according to their performance over the previous three months, and then test their performance over the following quarter. They find that the best performers achieve higher returns in the amount of 25-39 basis points. However, positive performance persistence over longer time periods is not

found. Kosowski, Timmermann, Wermers, & White (2006) find that past good and bad performance cannot be attributed solely due to luck, and that skilled and non-skilled managers do exist. Similar to Cuthbertson et al. (2008), they conclude that the top 10% of funds exhibit net-of-fee alphas which are unlikely to be due to random chance. In their European sample, Vidal-García (2013) finds persistence both in short-run (up to a year) as well as longer horizons (up to three years).

Since evidence that past performance is indicative of future performance is lackluster, it is somewhat surprising that in practice, good past performers experience high net inflows, while bad performers experience outflows. Berk & Green (2004) put forward a theory which challenges traditional thinking that the lack of performance persistence implies that any superior performance can be explained by pure luck alone. The authors argue that the reason an average mutual fund manager cannot consistently outperform the market is a consequence of the competitiveness for investors' funds. In their model, market participants associate positive past fund performance with manager skill and as a consequence, new money flows into the fund. In a hypothetical world where all information is known, free and readily available, all funds would be funneled to the highest skill manager, until they would have no one to trade with, making him unable to achieve excess returns. In a more realistic world, funds would flow to a number of successful managers, up until they could only provide investors with an average return equal to that of the market. Therefore, it is fierce competition in nearly fully efficient markets that makes even skilled managers unable to consistently achieve abnormal returns. The average stock-picking and market timing ability of managers cannot be deduced from their past performance – just because they on average do not outperform passive strategies does not mean they lack skill. The authors do not diminish the impact of luck on performance. In a world where the true skill level of managers is not known, it is natural that some money will flow into funds which have achieved superior performance in the past simply due to luck. However, over time the difference in the managers' abilities will be revealed and funds will flow to skilled managers, again up to the point where the risk-adjusted expected excess return is zero. Berk & Green (2004) ultimately conclude that the benefits of superior manager skill are reaped by the managers themselves, rather than the investors. Successful funds will grow in size because money inflows chase past performance, which allows the managers to collect an ever increasing AuM fee, while the investors ultimately achieve returns equal to the market.

In conclusion, a vast majority of literature shows that equity mutual funds in developed markets are not able to outperform their benchmarks on a risk-adjusted basis.

These results confirm the findings from the previous century, starting with the groundwork laid out by Jensen (1968). In terms of predicting future performance based on past performance, literature is less conclusive. Bollen & Busse (2005), Avramov & Wermers (2006) and Kosowski et al. (2006) find evidence of performance persistence, while other authors argue the effect is solely due to luck or can be explained by other factors such as momentum in underlying stock returns (Carhart, 1997) (Fama & French, 2010) (Nguyen, 2010). There is a significant gap in the literature concerning the European mutual fund industry, especially since the market has become more integrated. More studies are needed which compare performance of funds that invest both in domestic as well as pan-European securities, even more so since there is evidence pointing towards a possibility of achieving excess risk-adjusted returns.

4.1.2 Bond mutual funds

As mentioned in the literature review, there has been little research done on bond mutual funds compared to equity ones. However, this trend is rapidly changing due to the increasing size and importance of debt in global capital markets. In 2017, 22% of all mutual fund assets were held in bond funds, compared to 55% in equity. In the same year, the total net new cash flow into bond funds was \$260 billion, the largest since 2012 (Investment

Figure 6. Flows into bond mutual funds

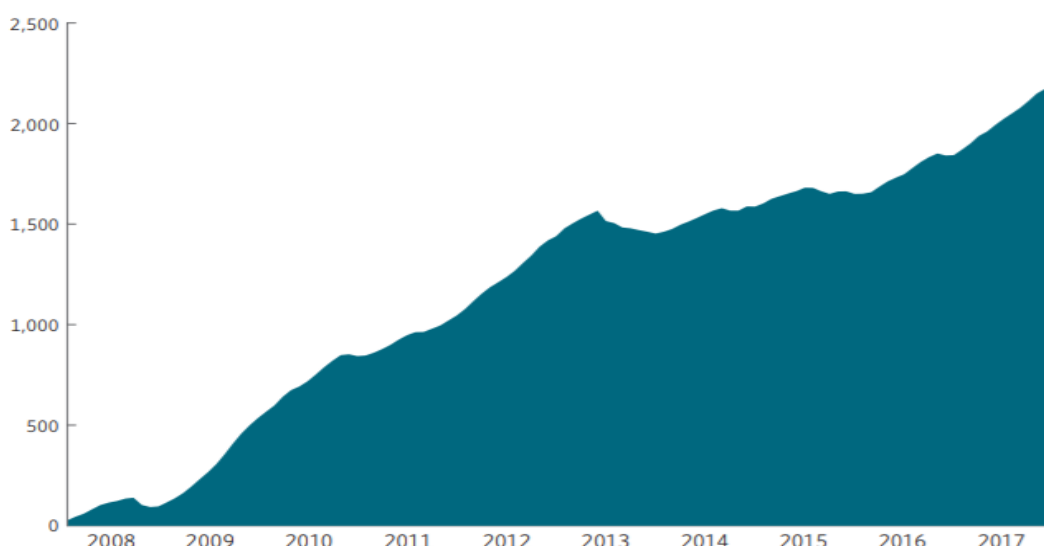


Figure 6. Cumulative flows into bond mutual funds (in billions of dollars) (Investment Company Institute, 2018, p. 72)

Company Institute, 2018, pp. 57–58).

Moneta (2015) shows that the turnover of bond funds typically exceeds those of equity ones, which means bond fund managers engage in more frequent active management. What little research has been done in the previous century suggests that, similar to stock funds, bond funds are unable to outperform their benchmarks on a risk-adjusted basis (Blake et al., 1993)(Elton et al., 1995). The following chapter offers a review of more contemporary literature on this topic.

Similar to Wermers (2000) for stock funds, Cici & Gibson (2010) perform an analysis on holdings of bond mutual funds at the individual security level. By doing so, the authors are able to decompose net fund performance into bond-selection ability, market timing, and fees and other expenses. This method shows if fund managers possess genuine skill in picking securities and if they do, whether the benefits of them doing so are passed onto investors. The sample consists of 2268 investment-grade and high-yield corporate-bond mutual funds from 1995 to 2006, including both surviving and dead funds. Unlike research on equity funds which generally does show some stock picking ability, the authors find that on average, bond managers are not able to pick corporate bonds that outperform other, similar bonds. Although some investment-grade bond funds show selection ability and some high-yield funds show timing ability, the benefits realized through this are not high enough in magnitude to cover management fees and transaction costs. Ferson, Henry, & Kisgen (2006) find similar results for U.S. government bond funds. The pre-expenses alphas are close to zero in their sample, turning negative after fees are included.

Chen, Ferson, & Peters (2010) focus specifically on the timing ability of bond fund managers. They argue that even though past research shows bond funds underperform on average, investors might still be willing to accept a lower average return if funds exhibit certain timing ability, such as mitigating losses in a down market. However, the authors find little evidence market timing skill of bond fund managers. In contrast to Cici & Gibson (2010), they find that fund managers do possess bond-selection ability, which is what drives 75% of funds to earn positive before-cost alphas. However, after fees and expenses are added back in, the net performance becomes negative. These results are confirmed by Moneta (2015), in one of the most recent studies on this topic. In a large sample of almost 1000 funds, he also finds no evidence of timing ability, but that managers are able to successfully pick bonds well enough to nearly cover their expenses and fees. Nevertheless, there is a body of literature showing some fund managers do possess market timing abilities. Boney, Comer, & Kelly (2009) investigate manager skill in context of switching weights between bonds and cash and bonds of different maturities in changing market conditions. In their survivorship

bias-free sample of investment-grade funds from 1994-2003, the authors find that some funds do show statistically significant timing ability. However, this does not translate to real economic benefits, as most funds in the sample underperform the benchmark even before expenses. Huang & Wang (2014) also find evidence of positive market timing ability at the one-month horizon in 146 government-bond funds. However, the effect disappears at the three- and six-month horizons.

Similar to equity funds, research has reached a nearly unanimous conclusion that an average bond mutual fund is not able to outperform the market on a risk-adjusted basis. As a logical next step, academics and practitioners alike set out to find potential evidence of performance persistence, whether successful funds in the future can be predicted by their past performance. Gutierrez & Maxwell (2008) conduct a comprehensive study of 1200 corporate-bond funds from 1990 to 2004. Similar to previous findings, both investment-grade and high-yield funds fail to outperform their benchmarks on a risk-adjusted basis. Interestingly, however, the authors find that the top decile of funds in the past year outperforms the bottom decile over the next four years. The effect is mainly due to losers continuing to be underperform, although some evidence of positive performance persistence is also found. For example, previous month's winners in high-yield funds continue to beat their benchmark by about 15 basis points, however the effect only lasts for a few months. By contrast, poor performance seems to persist for a longer period of time. The evidence of persistent gross performance over longer periods of time does indicate some bond fund managers are more skilled than others in selecting corporate bonds. However, Gutierrez & Maxwell (2008) conclude that the investors do not realize economic benefits from this ability, as the fees and expenses drive down multi-year alphas of these funds to zero. Similar to research on equity funds, the authors find that bond investors also chase previous performance and the winning funds in the previous period experience highest money inflows in the next period. However, consistent with the theory proposed by Berk & Green (2004), these inflows actually appear to hinder performance, especially in investment-grade funds, where funds with net inflows are shown to have lower returns in subsequent periods. Huij & Derwall (2008) conduct one of a few studies showing strong evidence of performance persistence which is economically significant for investors. They use a large sample free of survivorship bias, of 3500 government-bond, investment-grade, high-yield and mortgage-backed bond funds from 1990 to 2003. Although the average alpha of these funds is negative for all subgroups, they find strong evidence of the "hot hands" phenomenon. Investing in past month's winners outperforms a passive strategy by 1,79% per annum, even after accounting for expenses and

sales loads. The strategy, although less effective, is found to work for quarterly and yearly rebalancing as well.

The previously mentioned lack of literature on bond mutual fund performance is even more pronounced for the European market, with only a handful of studies on this topic. One of the most prominent ones is work done by Dietze, Entrop, & Wilkens (2005). They investigate the period from 2000 to 2005, of funds investing in high-quality German corporate bonds denominated in euros, using a fairly small sample size of only 19 funds. Using both single and multi-index models, and comparing to different indices, the authors find that most funds under-performed relevant benchmark portfolios. More notably, not a single fund showed significant positive alpha over the entire 5-year period. This holds true for net returns, however if fees and expenses are added back in, many funds do show positive performance, which indicates there is evidence of manager skill. Silva, Cortez, & Armada (2003) find essentially the same results regarding bond funds in Italy, Spain, Portugal, UK and France.

In summary, literature seems to point out that on average, bond mutual funds investors are not able to outperform passive investment strategies on a risk-adjusted basis. This is true for government, high-yield, investment-grade and mortgage-backed funds. Again, similar to equity funds, a number of studies show that some fund managers do possess superior security selection abilities, however the resulting economic benefits are consumed by the managers themselves in forms of fees, rather than investors. In terms of performance persistence, the results are more mixed. Huij & Derwall (2008) find strong evidence of the “hot hands” phenomenon which can be economically used to achieve returns superior to the benchmark. However, the findings are not supported by the rest of the literature, with most studies showing timing ability either does not exist or is not economically significant.

4.2 Mutual fund performance in recessions

Previous research has shown, almost unanimously, that an average mutual fund is not able to outperform a low-cost index fund, at least in developed markets. The question is therefore raised, why do investors keep investing in actively managed mutual funds as evidenced by their rapid growth in AuM over the past decades? Gruber (1996) calls this one of the largest puzzles in financial literature. One possible answer to this question is offered by Moskowitz (2000), who proposes that unconditional average return might not be the only value mutual funds provide to investors. Glode (2011) suggests one potential benefit of active investing that could provide an answer to Gruber’s puzzle. He creates a theoretical model in which negative expected average fund performance can be consistent with investors acting

rationally. The model assumes that mutual fund managers can generate state-specific excess returns. However, this comes at a cost to the managers as it requires time and effort to generate. Therefore, the managers choose to allocate the largest amount of resources in periods when it's the most important to investors; in times when they are willing to pay more for those returns. These periods, according to the author, are periods of economic downturn and recessions, when investors' marginal utility is highest. In other words, Glode (2011) proposes that investors, acting completely rationally and in accordance to the EMH, are willing to pay a price in a form of lower average returns for hedging benefits in times of economic downturn. In real-world tests of the model, he finds that funds with poor overall performance have higher average expenses, but also produce highly countercyclical returns. This could explain why some funds who persistently "underperform" continue to survive and receive investor inflows.

Glode's model has been tested empirically by Kosowski (2011) as well. He analyzes the performance of US domestic equity mutual funds from 1962 to 2005, dividing the time frame in periods of economic expansion and recession. Using Carhart's 4-factor model, Kosowski (2011) finds both statistically and economically significant difference of 3-5% per year in risk-adjusted performance between expansions and recessions. Given that the overall performance of the funds in the sample is negative, he concludes the source of underperformance is solely in times of economic upswing. In periods of downturn, investors enjoyed diversification benefits and capital protection higher than those of investing in passive index funds. Sun, Wang, & Zheng (2009) conduct a similar study, comparing the performance of active mutual funds in recessions and expansions using a sample from 1980-2008, with one key addition. The authors group the funds according to fund activity, in context of frequency of trades. They find that even though, on average, active mutual funds underperform their passive counterparts in times of recession, a subgroup of most active funds significantly outperforms. This is in sharp contrast to times of economic expansion, when most active funds exhibit slight underperformance to passive ones. The authors suggest the reason for outperformance of active funds during bear markets is due to superior security selection skills rather than timing ability. Sun et al. (2009)'s findings that an average mutual fund underperforms during recessions contradict those of Kosowski (2011). One possible explanation for this divergence could be that the time frame in Kosowski (2011) does not include the 2008 Global Financial Crisis, showing the sensitivity of results to time periods, benchmark indexes and models used.

Further evidence of this can be found in a recent study by Fink, Raatz, & Weigert (2015), who test Glode's hypothesis in an international setting. In 16 countries from 1980 to 2010, mutual funds are found to underperform the benchmark by 0,4% during months of economic downturn. Depending on the model used, the above result is true for 12-15 of the 16 countries in the sample, including the United States, and are consistent with all fund investment styles and different recession indicators. However, the authors state that the underperformance is greatly impacted by the GFC - performing the same analysis on a time frame ending in 2005 produces the same results as Kosowski (2011). Contrary to Glode's hypothesis, the authors find that funds with lowest recession performance in fact charge the highest fees, casting doubt on the theory that investors are willing to pay a higher premium for hedging benefits in down markets. Opposite to Sun et al. (2009), who suggest frequent trading is the source of outperformance due to manager security-selection abilities, Fink et al. (2015) conclude that more active management is the cause of underperformance, due to higher transaction costs. De Souza & Lynch (2012) examine different fund investment styles and how they differ in producing counter-cyclical performance in times of recession. The results show that most fund styles, including the most common ones such as growth and income, exhibit either pro-cyclical or non-cyclical performance patterns, even more so after accounting for momentum of the underlying stocks.

The only known literature about bond mutual fund performance that differentiates between periods of economic expansion and recession is work by Leite & Armada (2016). They investigate 39 actively managed bond funds domiciled in Portugal investing in Euro-denominated bonds from 2001 to 2012. Unsurprisingly, they find that that, on average, these mutual funds underperformed their passive counterparts during this 11-year time frame. The results show statistically significant negative alphas both in periods of economic expansions and recessions, and perhaps somewhat surprisingly, the negative performance is almost double in size during bear markets compared to bull markets. Confirming the findings of Fink et al. (2015) and Sun et al. (2009), almost all the negative performance can be attributed to the GFC, while during the Euro sovereign debt crisis funds performed significantly better.

In summary, evidence of mutual fund outperformance during economic downturns is mixed. Glode's (2011) theory - that investors are willing to sacrifice average return in order to obtain hedging and diversification benefits when their marginal utility is higher - is still open to debate. Even if that was the case, a large number of studies show that professional portfolio managers are no better at beating the market in bear markets than they are in bull markets. A great sensitivity of results to the time period and data chosen for a study can also be observed,

which necessitates further research into this topic, particularly after the 2008 Global financial crisis.

4.3 Mutual fund performance in emerging markets

The past decade has seen a rapid growth in assets invested in emerging markets. According to the IMF (2016, p. 63) the share of EM in global GDP has risen from 21% in 1980 to 36% in 2014 and EM stocks and bonds held by foreign investors has increased from \$1,5 trillion in 2005 to \$3,5 trillion in 2013. Mutual funds in emerging markets hold more than \$2,8 trillion in assets with a compounded annual growth of a staggering 21% PwC (2014,

Figure 7. AuM growth by region

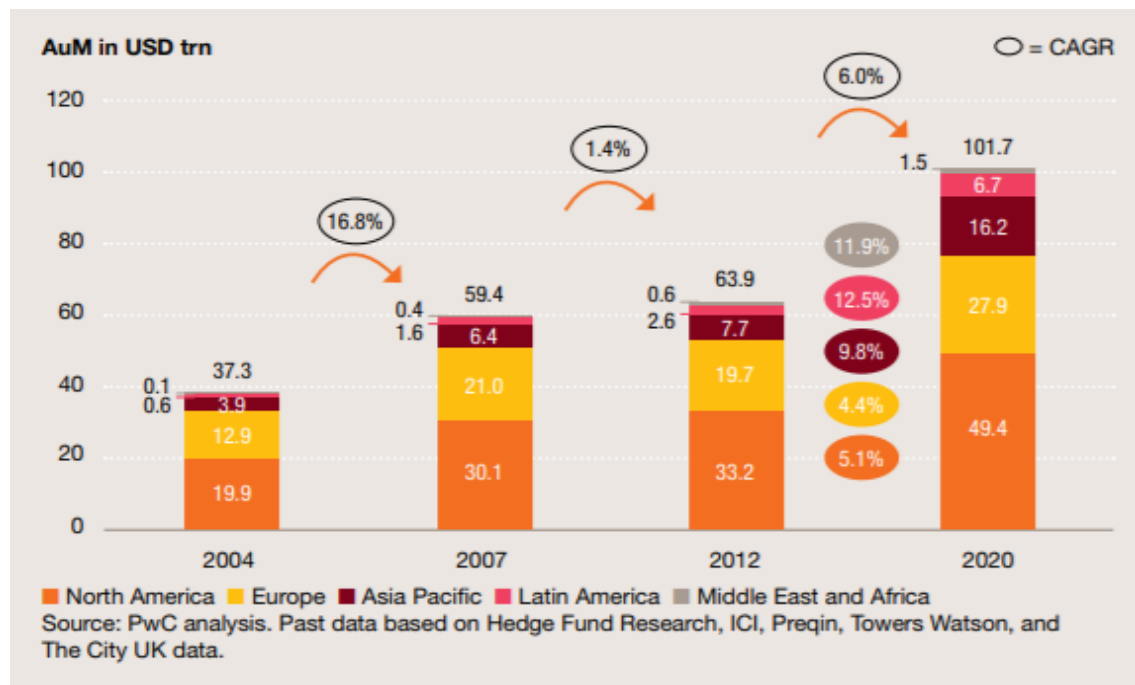


Figure 7. Total AuM growth and projection by region (PwC, 2014)

p. 6). At such rate, the AuM in EM will double in four years.

The overall increase of wealth and financial education, high rates of growth, higher reliance on capital markets rather than banks, low correlation with the developed world as well as development of information technologies and easiness of doing business have all contributed to EM mutual funds being a popular target of international investment flows (Lemeshko & Rejnuš, 2015). There is a prevalent opinion among finance and investment professionals that emerging economies' markets are less efficient than those of the developed world. The more inefficient capital markets are, the greater opportunity for excess return there is for those who spend resources to acquire information. Indeed, Cajueiro & Tabak (2004)

show that Asian and Latin American economies show greater signs of inefficiency than those of US and Japan. They also find that market efficiency is positively related to the size of the market measured by total capitalization, and negatively correlated with trading costs, which is in line with the differences between emerging and developed economies in the real world. However, even under the assumption that EM are less efficient and securities are more often mispriced, there are various limitations that could hinder investors from exploiting them to gain economic benefits. Main constraints represent prohibition or severe limitations of short selling, underdeveloped derivatives markets, intrusive and complicated regulation and supervision and less experienced and knowledgeable management (Eling & Faust, 2010, p. 1993). Another major obstacle is lack of research due to limited data availability and costs associated to obtaining information. This especially applies to foreign fund managers and individual investors who often have limited or restricted access to information, which creates an opportunity for local mutual fund managers to achieve abnormal risk-adjusted returns.

In the academic world, evaluating performance of emerging market mutual funds has its own challenges. One of them is that “emerging markets” is a fairly wide term, and there is no consensus on exactly which economies fall under this category. Research on this topic is most commonly done on a country by country basis, making it hard to derive conclusions about performance of mutual funds in certain EM regions, or EM as a whole. Another shortfall is the prevalence of survivorship bias in many of these studies, due to relatively short time-series of available information and information databases not being as comprehensive and developed as is the case for the US or Europe. Nevertheless, the remainder of this chapter will be dedicated to reviewing the literature on EM mutual fund performance, in order to gain insight to whether managers in less efficient markets are more successful at beating the market than their counterparts in developed countries.

A recent study by Lemeshko & Rejnuš (2015) provides a comprehensive overview of EM mutual fund performance. The authors cover all the most relevant EM regions - Central and Eastern Europe (CEE), South Eastern Asia (SEA), Middle East and North Africa (MENA) and BRIC (Brazil, Russia, India, China). In total, 4796 funds are examined from 2000 to 2015, in a sample free of survivorship bias. The authors utilize both unconditional and conditional, single- and multi-factor models. On average, across all countries, the median fund underperformed the market benchmark on a risk-adjusted basis, both in times recession and expansion. These findings seem consistent with those of mutual funds in developed markets. However, the authors note that except in MENA, every other country group contains number of consistently top performing funds, regardless of macroeconomic conditions. If

positive performance in the future can be predicted using past performance, it would go against the EMH and allow for excess returns. A hallmark study by Huij & Post (2011) investigates performance persistence of US-domiciled funds investing in emerging markets assets from 1962 to 2005. The authors find that the top performers of the previous quarter outperform the bottom performers in following month by 7,26% annually. Unlike previous studies by Carhart (1997), Gutierrez & Maxwell (2008), Cuthbertson et al. (2008) and others, who find this difference is mainly due to poor performers continuing to underperform, Huij & Post (2011) find evidence of past winners continuing to be outperform, with top funds beating the market by more than 4% per annum. The authors conclude investors can profit from the “hot hands” effect, and, although making no assertions about the effectiveness of active management compared to passive alternatives, suggest that EM funds display better performance than US funds.

Basu & Huang-Jones (2015) conduct a study which combines elements of the two previously mentioned. Similarly to Lemeshko & Rejnuš (2015), they investigate a sample of 498 US-domiciled funds investing in Asia, Latin America, CEE and MENA countries between 2000 and 2010. Out of all the funds, 202 were alive for the whole period, 72 disappeared and 224 were created at some point during the 10-year period. The authors find that an average fund underperforms the MSCI Emerging Market index, both using single-factor CAPM and 3-factor Fama French models, although the alphas are not statistically significant. It is worth mentioning that the average beta of the funds is 0.96, and that market returns explain over 90% of fund returns, which suggests the funds closely track the market index and do not engage in active management to a large degree. The authors also investigate conditional performance of the funds during and after the GFC, from August 2008 to July 2010. Again, however, the results show the funds underperform the benchmark using both models, indicating the managers cannot exploit informational asymmetry to achieve abnormal returns. Like Huij & Post (2011), Basu & Huang-Jones (2015) also test for performance persistence, grouping funds based on the returns of the previous 3 months, and holding those funds for the next 3-6 months. They find evidence of performance persistence both in top and bottom performing funds, with difference in alpha between best and worst portfolios being 4,5% for the 3-month holding period and 2.96% for the 6-month holding period. This is consistent with findings of Huij & Post (2011) but with a considerably smaller spread (4,5% and 2.96%, compared to 7.09%). The most likely arises due to longer holding periods of 3 and 6 months, compared to one month of the previous study. More importantly, consistent with evidence from developed markets, the authors find that the persistence can almost fully be

explained by poor performers continuing to perform poorly, with no evidence of positive persistence. Therefore, it is not possible to generate economic benefits by following a “hot hands” trading strategy. Basu & Huang-Jones (2015) offer two explanations for their results - either the emerging markets have become no less informationally efficient in recent times compared to developed markets, or domestic fund managers have informational advantages over their foreign counterparts.

As mentioned before, a crucial aspect when evaluating mutual fund performance is the choice of passive index to which to compare the returns to. This might not be an issue in the case of US mutual funds investing in large-cap domestic equities, as the S&P 500 index serves as a clear benchmark. However, the choice is less clear for emerging markets. For example, a US investor considering investing in a US-domiciled EM mutual fund might be faced with a dilemma between using the S&P 500, a global market index, or an index or group of emerging market indexes as their benchmark. A case can be made for each of the options. The S&P 500 provides a cheap and familiar domestic alternative, with likely lower risk. On the other hand, a composite global index could provide exposure to emerging markets, with developed countries providing a natural hedge. Finally, there is a plethora of emerging market indexes from various providers, including global, regional and country-specific ones. Michelson, Philipova, & Srotova (2008) compare the performance of 55 open-end emerging market equity mutual funds from 1999 to 2005 in relation to a set of indexes. They find that the funds outperformed the MSCI global index and the S&P 500, but underperformed a composite emerging market index, constructed using 3 different EM indexes. However, the study covers a relatively short time period when the EM economies experienced strong growth after the Asian crisis and the US was suffering from the tech bubble bursting. Additionally, Michelson et al. (2008) use only CAPM-based Sharpe and Treynor ratio to rank performance, when 3- and 4-factor models have proven to explain a much greater percentage of returns. This study is an example of how the time period, indexes selected for benchmarks and models used can influence the results and can potentially be “cherry-picked” by researchers in order to show desired or expected results.

In contrast to Lemeshko & Rejnuš (2015), whose comprehensive paper covers domestic emerging market mutual funds in all the emerging market regions, most studies on this topic are focused on a particular EM region or country. For example, Premaratne & Mensah (2014) examine mutual funds in Hong Kong, Singapore, Malaysia and Philippines and conclude that, on average, the funds underperformed their respective benchmarks from 2000 to 2013. In Poland, performance of 140 funds was tested using Carhart’s 4-factor model

(Białkowski & Otten, 2011). Consistent with previous studies, they find that an average domestic equity fund delivered significantly negative alpha between 2000 and 2008. However, the authors note that international funds investing in Poland underperformed to an even larger extent, suggesting that domestic investors have an informational advantage over foreign ones. This is also reflected in preference of local funds for smaller stocks and foreign funds for bigger stocks, for which information is easier to come by. Unlike international funds, domestic funds delivered positive gross-of-fees alphas, proving local managers have the ability to pick stocks well enough to outperform the market, but the benefits are absorbed by the managers in the form of fees, rather than being realized by investors. The authors also test for performance persistence by grouping funds into 3 groups based on past 12-month returns, and then testing the performance for the next 12 months. Consistent with findings by Huij & Post (2011), the authors find Polish funds exhibit strong persistence. Buying the last year's top funds and holding them for the next 12 months yields significant positive alpha even after accounting for high load fees. Laes & Silva (2014) find interesting results in Brazilian mutual funds. Even though in the period from 2002 to 2012, over half the mutual funds were not able to produce risk-adjusted after-fees returns greater than the market, the results were not consistent across different fund sizes. Smaller funds were the source of most of the underperformance, with the larger funds performing notably better. In fact, 12% of the largest funds had significant positive alphas. These results offer an attractive avenue for further research with broader implications than on the Brazilian market, which will be further explored in the concluding chapter.

Even though a previous study by Premaratne & Mensah (2014) find evidence of underperformance in Malaysian funds from 2000 to 2013, Lai & Lau (2010) find the opposite is true for 311 mutual funds from 1992 to 2005. The authors find evidence of outperformance both during expansion times as well as in the Asian financial crisis of 1997. However, the study does not include the recession after the GFC, which could explain the difference in results from Premaratne & Mensah (2014). In a recent study, Rao, Tauni, Iqbal, & Umar (2017) investigate the mutual fund industry in China. China is the largest emerging market economy in the world with a rapidly growing asset management industry – in the 11 years of the study the number of mutual funds has grown by 759% (Rao et al., 2017, p. 2). In total, a bias-free sample of 520 domestic equity funds was examined from 2004 to 2014, testing performance with CAPM, Carhart 4-factor as well as market timing ability and performance persistence. The authors find that equity mutual funds, on average, beat the market and contribute this to the fact that a much lower percentage of assets held by professional

investors (~30%) than that in the US and other developed markets (60% or more). Since active investing is a zero-sum game, any amount of outperformance of a group of investors has to be matched by an equal amount of underperformance of another group. Since a larger share of Chinese investors are not informed, professional managers, it allows for greater opportunity to achieve excess returns due to superior skill and information. Rao et al. (2017) also test for performance persistence, constructing portfolios using previous 12-month returns and analyzing their performance in the following 12 months. In contrast to a large number of emerging market literature, no persistence is found.

Like in developed markets, the literature on bond fund performance in EM is much scarcer than that on equity funds. Polwitoon & Tawatnuntachai (2008) conduct the first known study into emerging market bond fund performance. In a relatively small sample of 50 US-domiciled funds investing in EM bonds from 1996 to 2005, the results show underperformance compared to emerging market benchmark indexes, but outperformance compared to US and global bond funds with similar risk characteristics. The authors find some evidence of short term performance persistence, however not enough to exploit as a trading strategy when transaction costs are included. In a similar, more recent study Kiymaz & Simsek (2017) look at 78 US-based EM bond funds from 2000 to 2017. Consistent with Polwitoon & Tawatnuntachai (2008) they find an average Jensen's alpha of -0.13% suggesting most funds did not provide excess returns for their investors. Unlike the previous study, however, Kiymaz & Simsek (2017) show that the funds underperformed even US bond benchmarks. Again, the difference is most likely due to the time periods tested, with the first study covering the Asian crisis of 1997 but not the GFC, while the opposite is true for the second.

Movassaghi, Bramhandkar, & Shikov (2004) conduct one of a small number of studies of closed-end mutual funds. They study 100 funds from 1998 to 2002 and compare returns of those which invest primarily in developed markets versus those primarily investing in emerging markets. No persistent difference between the two categories is found, and there were no consistent outperformers within different EM regions either. Finally, Gottesman & Morey (2007) try to find if EM mutual fund performance can be predicted using metrics that were tested for developed markets, such as expense ratios, past performance and size. Similar to Carhart (1997), the authors find that the only reliable predictor is expense ratios, and the relationship is significant and negative, meaning that funds with lower fees perform better.

The overall results for mutual fund performance in emerging markets are mixed. Even though popular belief is that EM are less efficient than developed markets which would create

opportunities to be exploited, a surprisingly large number of studies show negative average mutual fund performance. However, there is a much stronger case to be made about performance persistence in EM, as compared to developed world. These findings suggest there could indeed be some managers who are more skilled than others and are able to consistently provide higher return for their investors. One benefit of investing in emerging markets that is practically universally recognized is diversification. EM, while usually more volatile than the developed markets, offer exposure to different factors and conditions, and often have low correlation with developed countries' assets. As mentioned before, drawing conclusions about EM mutual fund performance has its own set of challenges which do not apply to the developed world. First of all, "emerging markets" is a particularly broad term, and most studies focus only on a specific region or country. Secondly, some studies test for domestic fund performance in EM markets, while others concern foreign funds investing in EM assets. Further research is needed to show if local managers have informational advantages in their local markets compared to international investors. Finally, different studies use different indexes as performance benchmarks, including the S&P 500, various composite emerging market indexes, as well as regional and country-specific indexes. All this makes drawing conclusions about mutual fund performance in emerging markets as a whole an exceptionally difficult task.

4.4 Hedge fund performance

As previously mentioned, research on hedge fund performance has not been covered in the literature review due to the fact that that section focuses on literature before the year 2000, when hedge funds were still in their relative infancy. Even though they have been in existence for almost 70 years, hedge funds have started gaining popularity in the 1980s, growing at a rate of about 25% a year. In 1997 there were 1200 HFs managing approximately

Figure 8. Hedge fund AuM

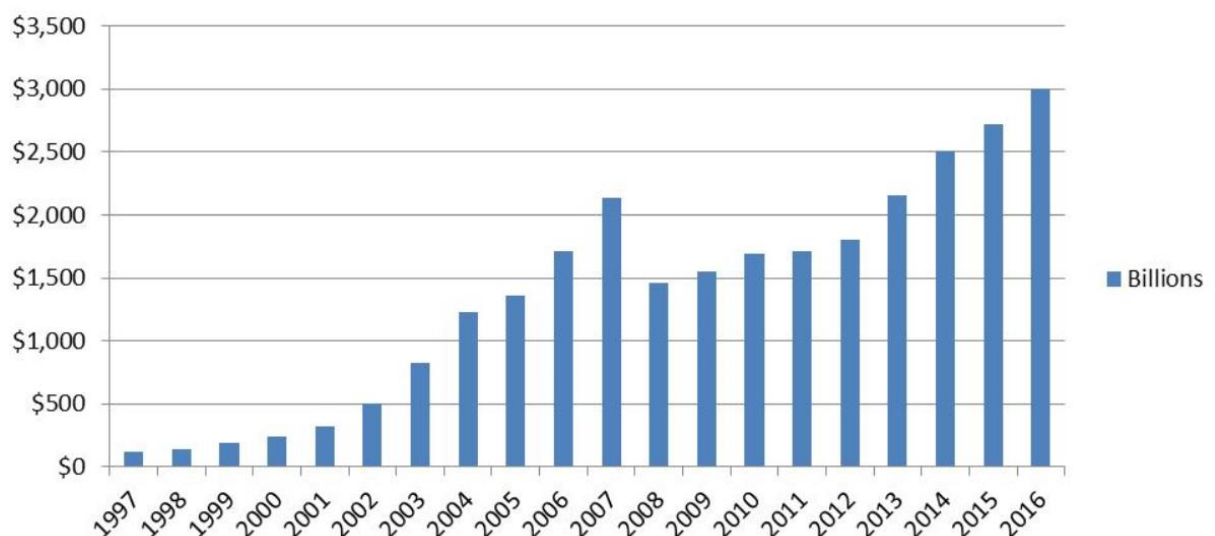


Figure 8. Total hedge fund AuM 1997-2016 (Hedge Fund Marketing, 2017)

\$200 billion in assets (Ackermann, Mcenally, & Ravenscraft, 1999, p. 833). By the end of 2017, hedge funds managed more than \$3,3 trillion in assets (Preqin, 2018, p. 18).

There are multiple features that differentiate hedge funds from mutual funds. From an organizational perspective, HFs are largely unregulated limited partnerships. As a consequence, they have a relatively light supervisory oversight, no reporting and disclosure requirements and low transparency. Compared to mutual funds, hedge funds employ much more flexible and diverse investment strategies, including both long and short positions, derivatives, illiquid assets and leverage. The reason hedge funds are allowed to operate in this way is because they are only open to investments from sophisticated investors (usually HNWIs and institutions) and are prohibited from traditional means of advertising. Additionally, hedge fund managers usually invest a significant amount of their own money into the fund, in order to ensure that their incentives are aligned with those of the investors (Ackermann et al., 1999, p. 834). Unlike mutual funds which use long-only strategies and are generally highly correlated to the market, hedge funds are considered as investments with fairly low betas. With virtually limitless trading strategies at their disposal, hedge fund managers claim they can achieve alpha in all market conditions. One of the more controversial characteristics of hedge funds is their fee structure. Apart from a fixed AuM fee similar to mutual funds, HFs generally charge a performance fee, in the amount of 10-20% of annual profits. This fee is most commonly applied only if returns surpass a certain hurdle rate; in other words, it is not charged until the fund recovers past losses. The cost structure of hedge funds has received a large amount of criticism over the years, with claims that it is too high and promotes excessive risk taking. Under pressure over poor performance in the last decade, many hedge funds have started decreasing or changing their fee structure. Apart from higher costs, there are other downsides for HF investors which are not present with mutual funds. The so-called lock-up periods, during which investors are not allowed to withdraw their initial investments are a staple feature of hedge funds. So, too, are large minimum investment amounts which make HFs out of reach for most retail investors. Lastly, due to their low transparency, a lengthy and/or costly due diligence process is required when choosing a fund to invest into.

Even though hedge fund managers have virtually unlimited discretion when making their investment decisions, most funds tend to focus on one particular strategy. Brooks & Kat (2001, pp. 2–3) and Agarwal, Daniel, & Naik (2004, p. 9) give an overview of the most common approaches HF managers take. Long/short equity has historically been the most used strategy. The fund takes long and short positions in different stocks trying to exploit

mispricings, while usually having low correlation to the market. Long/short funds can be net long, net short or market neutral. Global macro funds trade in various asset classes in different geographical regions. They follow economic trends, events and news in the global economy, and try to profit from changes in interest rate and foreign exchange. Global funds can also be specifically focused on emerging markets. Event driven strategies try to profit from various events in a company's life cycle, such as mergers, acquisitions, IPOs, reorganization and bankruptcy.

There has been an extensive amount of research done on the performance of hedge funds. Unlike the case of mutual funds, where the conclusion of Jensen (1968) that an average fund underperforms the market has not been challenged in a significant way, research on HFs has been much more diverse. Consequently, this thesis will cover the topic of hedge fund performance in great detail. Before reviewing the relevant literature, however, a number of limitations hedge fund studies suffer from require mentioning. First of all, Malkiel & Saha (2005, pp. 82–83) and Fung & Hsieh (2004, p. 66), among many others, explain potential biases in hedge fund performance research that arise due to HFs not being required to publicly report results. Since managers can voluntarily choose to provide their return data to various data repositories, it is reasonable to assume that those managers who do well are more likely to report. When a fund enters a database, its past returns are automatically added as well. This creates a so-called backfill or instant history bias. Managers often create a number of small funds using their own money, adding only the successful ones to databases when looking for outside investors. This obviously skews the average hedge fund performance in that database upwards. Furthermore, survivorship bias is present for hedge funds the same way it is for mutual funds. If funds are removed from the database after ceasing to exist, it also creates an upside bias since it is assumed that most funds get closed down due to poor performance and investor outflows. Eling (2009, p. 363) states that hedge fund data before 1994 will likely contain major survivorship bias since the main databases covering HFs did not cover dissolved funds before that year. Because of this, most research on HF performance covers a time period beginning in the year 1994 or later.

Apart from biases, there are other issues which might impact the results of research on hedge fund performance. One of them is the choice of which database will be used in a study. Since hedge funds report results on a voluntary basis and managers can choose which data vendor to report to, there is no comprehensive database containing all HFs in a country or region. For example, Agarwal et al. (2004, p. 8) find that in the year 2000 there were 1776 active hedge funds. However, only 309 of them were present in all three most common HF

databases. Additionally, evaluating hedge fund performance in general is not a straightforward task. Due to being able to take on leverage, short and long positions, invest in different markets and asset classes, it is often very difficult to analyze hedge fund performance compared to more traditional buy-and-hold strategies. CAPM and multi-factor models such as Fama-French 3-factor and Carhart 4-factor models are inapplicable to most hedge funds strategies since they contain only equity risk factors. That is why early HF studies often use Sharpe ratio to measure performance. However, this method is far from ideal since it assumes returns are normally distributed and, additionally, using standard deviation as a measure of total risk may not be applicable to HFs due to complex risk taking and leverage employed. Fung & Hsieh (2004) develop a 7-factor model based on APT, claiming it explains around 80% of hedge fund returns. Moreover, since the life span of an average HF is only a few years, the return series are often too short for traditional measurements like Jensen's alpha to be precise. Holdings-based approaches used in some mutual studies are not applicable to hedge funds either, since they are not required to publish their portfolios (Kosowski, Naik, & Teo, 2007, p. 230).

4.4.1 Hedge fund performance before the Global Financial Crisis

Figure 9. Number of hedge funds

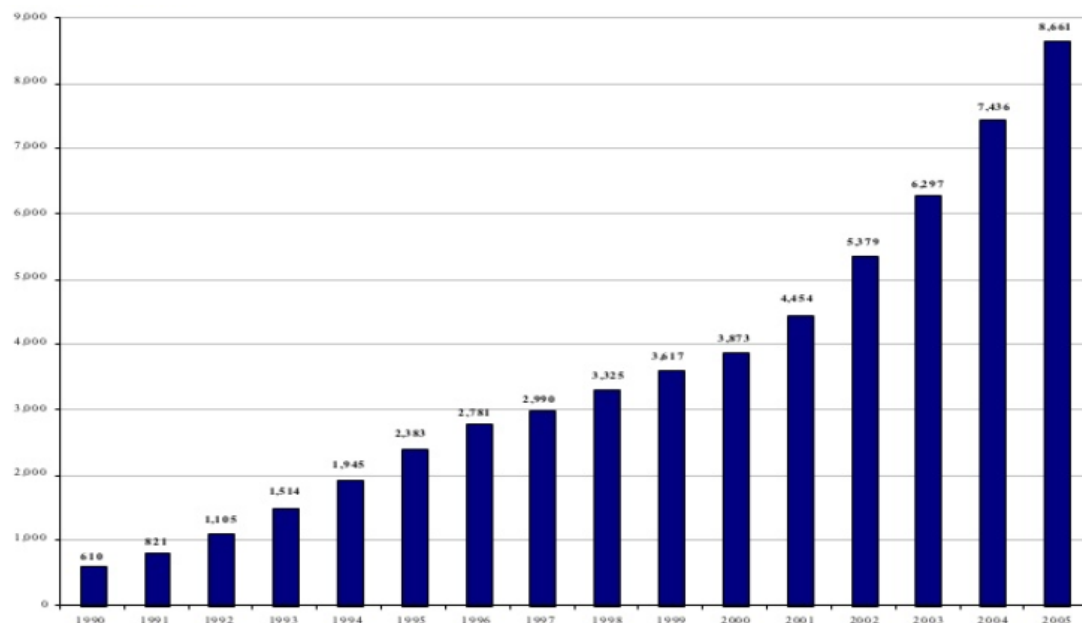


Figure 9. Number of hedge funds from 1990 to 2005 (HFR, 2005)

Hedge funds exploded in popularity in the 1990s. The above picture shows that their number grew more than six-fold in the last decade of the 20th century, from just over 600 to almost 4000. The rapid growth can partially be explained by their good performance.

Unlike mutual funds, the literature seems to show that HFs were able to outperform the market on a risk-adjusted basis before the global financial crisis. However, caution has to be exercised when referring to the “market” in context of hedge funds. The goal of this thesis is to compare the returns of active versus passive investing. In a practical sense, passive investing is most commonly exercised through buying and holding an index fund tracking a broad market index, such as the S&P 500. Mutual funds are relatively easy to compare to this benchmark, since they are long-only funds investing in the same securities contained in the index they are attempting to beat. However, hedge funds use leverage, short positions, derivatives and invest in a large number of asset classes. Therefore, finding a “market” to compare the returns to can be difficult, and this difficulty is reflected in a large number of different models used across various studies.

Ackermann et al. (1999) perform one of the first studies on hedge fund performance. Monthly returns of 906 hedge funds from two databases are examined, in two-, four-, six-, and eight-year samples ending in 1995. The authors compare the hedge funds to the S&P 500 and MSCI EAFE, which is a value-weighted index for Europe, Australia, New Zealand and

the Far East, as well as mutual funds in the same time period. They find that HFs overall had a higher Sharpe ratio than mutual funds due to having greater returns, but also taking higher risk. However, although certain categories of hedge funds were able to beat the market depending on the time period and index used, they were, on average, unable to beat the indexes on a risk-adjusted basis. Similar to mutual fund studies, Ackermann et al. (1999) find that the magnitude of underperformance is approximately the amount of fees charged, implying the managers possess skill in finding underpriced and overpriced securities. Since hedge fund fees are much higher than those of mutual funds, the results suggest HF managers are, on average, more skilled, or have more tools to achieve higher returns, than managers of mutual funds. Even though the authors find HFs underperformed passive benchmarks, they also document low correlations of returns to the market (low betas). Therefore, hedge funds may provide a valuable addition to many investors' passive portfolios by improving its risk/return profile.

Interestingly, in the same year, Brown, Goetzmann, & Ibbotson (1999) conduct a similar study to Ackermann et al. (1999), but find very different results. The researchers construct a database of off-shore hedge funds from 1989 to 1995, including non-surviving funds. They compare both an equal-weighted and value-weighted portfolio of funds against the S&P 500 index using the Sharpe ratio. Like Ackermann et al. (1999), Brown et al. (1999) show that the equal-weighted portfolio had lower returns than the benchmark index. However, unlike the previous study, the authors also find lower volatility, resulting in the HF portfolio having a higher Sharpe ratio than the S&P 500. The value-weighted portfolio, on the other hand, had higher returns and higher volatility than the market, still resulting in a higher Sharpe ratio than the market. It is unclear what the cause of divergence in results between these two studies is. Brown et al. (1999) note that some survivorship bias is likely still present in their sample. Even though data for defunct funds was obtained, the performance of investments in funds that disappeared within a year cannot be followed, effectively eliminating data for the year the fund was closed down. Most ensuing literature on hedge fund performance confirms findings by Brown et al. (1999), showing hedge funds did outperform the market before the GFC. For example, Agarwal & Naik (1999) conclude that a portfolio adding non-directional hedge fund strategies performs better than a purely passive one. Instead of the Sharpe ratio used in previous studies, the authors employ a ten-factor model covering a wide range of asset classes, including a US and EM stock market index, various bond indexes, as well as currency and commodity indexes. Agarwal & Naik (1999) argue this model more adequately measures hedge fund returns because of the diversity of strategies

employed by their managers. Using the multi-factor model, they find that HFs outperform the benchmarks by 6-15% annually. A more recent study by Ibbotson, Chen, & Zhu (2011) decompose returns using two different models. In the first, using traditional stock, bond, and cash (risk free) betas, the authors investigate if hedge funds add value to investors with portfolios allocated only to traditional stocks, bonds and cash. The average alpha of 6169 funds over a 14-year period from 1995 to 2009 was 3% per annum. All nine hedge fund categories tested has positive alpha, although only four were significant at the 5% level. The second model, a seven-factor model developed by Fung & Hsieh (2004) which had a higher R^2 , showed a lower, but still statistically significant, positive alpha. Ibbotson et al. (2011) are one of the first who attempt to account for backfill as well as survivorship biases. They do so by not including the return history of hedge funds before they started reporting the returns, since it is assumed that most managers choose to enter a database after a period of good performance.

Even though literature generally shows that hedge funds did outperform the market before the Global financial crisis, there are authors that point out certain shortcomings in previous studies. For example, Dichev & Yu (2011) compare the dollar-weighted to buy-and-hold returns investors would achieve by investing in hedge funds. The authors argue that the buy-and-hold return measurement would only be viable for investors who had invested at the inception of a fund, and kept the same position throughout. In reality, most hedge funds are small in size at their inception, with a considerable share of manager's money. After this incubation period, if the fund proves to be successful, it receives large capital inflows. However, as evidenced by Berk & Green (2004), investing more capital also makes it progressively harder to achieve excess returns. Therefore, Dichev & Yu (2011) argue that using dollar-weighted returns, which weigh those returns when the fund was large more, is a more proper way to measure performance, since it represents the returns investors would actually achieve. Using this method on nearly 11000 HFs from 1980-2008, they find the returns are 3-7% lower than corresponding buy-and-hold returns, which would make many previous studies that show outperformance invalid. For example, in the time period mentioned, the buy-and-hold portfolio of hedge funds returned 12.6% annually. The dollar-weighted return, however, was 6% lower, which underperforms 10.9% per annum returned by the S&P 500. The results are consistent with all types of hedge funds, fund sizes and management fees.

Apart from individual fund returns, another way of evaluating hedge fund performance is by using funds-of-funds (FoF). FoF are hedge funds that do not invest in securities, but

rather in a diverse portfolio of other hedge funds. They allow investors easier exposure to the hedge fund industry, as they accept much lower initial investments. Apart from that, conducting an analysis on a big sample of essentially private investment vehicles like hedge funds is costly, impractical and often impossible for retail investors, especially considering HFs are prohibited from advertising. Diversifying one's hedge fund portfolio is practically impossible for all but the wealthiest investors. Another advantage of FoF is that they allow investments in HFs who are closed to new inflows (Fung & Hsieh, 2000, p. 300). The main disadvantage of funds-of-funds is their fee structure. Apart from costs associated with the underlying hedge funds in a portfolio, an investor is also charged a similar amount by the FoF, effectively doubling the fees.

Nevertheless, there are multiple advantages of using FoF as a proxy for individual fund returns in academic research. As Fung, Hsieh, Naik, & Ramadorai (2008, p. 1778) explain, if an individual fund is about to liquidate, it is likely going to stop reporting results to a database, making the return history not fully reflect the losses to investors. A fund of funds invested in the same hedge fund, however, has a much higher chance of surviving the collapse of one of the underlying funds, because of its relatively diverse portfolio. Since the returns to investors represent the performance of all funds in the portfolio, the track records of FoF retain the effects of HFs that went out of business or stopped reporting. Thus, FoF do not contain the survivorship bias that underlying portfolio of hedge funds does. Fung & Hsieh (2000, pp. 300–301) find that the survivorship bias of FoFs is less than half that individual HFs exhibit.

Fung et al. (2008) test 1603 FoF from 1995 to 2004 using a 7-factor model developed by Fung & Hsieh (2004). They find that the average FoF delivered negative alpha across the entire time frame. Even though the average fund underperforms, the authors show that 22% of funds do deliver consistent positive alpha. These FoF also exhibit far lower liquidation rates and receive much higher capital inflows. However, consistent with Berk & Green (2004) and Dichev & Yu (2011), the results show that these capital inflows negatively affect future performance, as these funds are less likely to deliver alpha in next period. This effect seems to be true for the hedge fund industry in general. The last few years of the sample period have seen a substantial increase in capital inflows to the HF universe, while at the same time the average alpha delivered by funds has decreased. Ammann & Moerth (2008) examine the performance of 662 FoF from 1994 to 2005, using an asset-class factor model which includes stock, bond, currency and commodity indexes. They find that the average return of an equal-weighted portfolio of FoF was lower than that of individual hedge funds, by approximately

the amount of fees. An asset-weighted portfolio exhibits higher returns, however still underperforming individual funds. The authors explain this difference by larger funds generally having access to more and better hedge fund managers, as well as charging lower fees on average (Ammann & Moerth, 2008, p. 49). They also confirm the findings of Fung & Hsieh (2000), that funds-of-funds data exhibits less survivorship bias than that for individual funds.

Even though literature generally shows that an average FoF underperforms an average hedge fund, Ang, Rhodes-kropf, & Zhao (2008) argue that it is not fair to directly compare returns between the two strategies. An investor “must compare her own skills, costs, and ability to find and monitor hedge funds with those of a fund-of-funds manager” (Ang et al., 2008, p. 2). A typical investor is extremely unlikely to be able to invest in an “average” hedge fund, because of the costs and the amount of assets needed to diversify a portfolio of HFs, or because they lack the skill and resources needed to construct such a portfolio. Therefore, instead of comparing the returns of FoFs to an average hedge fund, Ang et al. (2008) propose it is more adequate to compare them to the returns of a portfolio of HFs a typical investor can realistically find, evaluate and monitor. The authors conclude that an average investor, with a relatively small amount of investable assets, would generally choose hedge funds which are worse than a typical hedge fund, because they are competing against other, more skilled and sophisticated investors, as well as FoF managers. Therefore, they would be better off investing in a FoF. Even though Ang et al. (2008) recommend investing in funds-of-funds rather than individual hedge funds for average investors, they make no implications about the viability of investing in HFs compared to other asset classes in general.

There is a separate strand of literature on the topic of hedge funds investing in emerging markets and how their strategies compare to those of funds investing in developed economies. On one hand, literature on EM mutual fund performance is much more inconclusive than for developed markets, with multiple studies finding evidence of outperformance. This implies HFs could exploit mispricing opportunities as well in order to generate excess returns. On the other hand, hedge funds use alternative strategies such as leverage, shorting and derivatives which might be unavailable or limited in emerging markets. This naturally raises the question if hedge funds in EM can provide any value compared to mutual funds or passive investing. Abugri & Dutta (2009) compare the behavior of emerging market hedge funds (EMHFs) to those of mutual funds. They find that before 2007, EMHFs behaved more like mutual funds than developed market hedge funds, with strong correlations and exposure to stock and bond market indexes. The trend changes after 2007, however, when

EMHFs start exhibiting more characteristics of their developed market counterparts. Abugri & Dutta (2009) also test performance by comparing 4 EMHF indices: Asia, Eastern Europe, Latin America and a composite EMHF index, in a time frame from 1997 to 2008. They find that some HF indices outperform the benchmarks on a risk-adjusted basis, however the results are not conclusive enough to conclude that EMHFs are, in general, superior to passive strategies. Eling & Faust (2010) find that hedge funds provide higher alphas than mutual funds in EM, as well as bigger downside protection. A number of HFs are also able to consistently beat the benchmarks on a risk-adjusted basis, which is not true for mutual funds. However, the authors caution that the outperformance of HFs may be due to use of leverage, lock-up periods and investing in illiquid assets, strategies which are unavailable to mutual funds and need require compensation in the form of a risk premium. Finally, Eling & Faust (2010) confirm the findings of Abugri & Dutta (2009) that EMHFs have started behaving more like their developed market counterparts since derivatives and short selling have become more available in EM. Strömquist (2007) investigates 418 EMHFs from 1994 to 2004 and finds that, on average, they were not able to produce excess risk-adjusted returns. However, the author notes an upward trend in performance over the time period and suggests EMHFs could become an attractive investment option in the future. These findings may be related to those of (Abugri & Dutta, 2009) and (Eling & Faust, 2010), suggesting that structural improvements in emerging market infrastructure and new investment instruments could have contributed to the increase of EMHF performance. Finally, Kotkatvuori-Örnberg, Nikkinen, & Peltomäki (2011) investigate whether EMHFs with a particular geographic focus can outperform the market. In a sample of 786 funds from 2000 to 2009, they find that funds with a geographical focus do indeed exhibit statistically significant abnormal positive performance. The authors argue the results can be explained by informational advantage that managers have by focusing on a specific region or country.

4.4.2 Performance persistence in hedge funds

Performance persistence is one of the main topics in financial literature. If future performance can be predicted using past data, investors can achieve excess returns by investing in funds more likely to perform well in the coming period, even if an average fund underperforms the market. Literature on this topic regarding mutual funds is largely inconclusive, with some evidence of short-term, but not long-term persistence present. It is often suggested that successful mutual fund managers move to hedge funds due to higher

compensation. If this is true, it could explain why mutual funds lack persistence in the long run, and implies HFs should exhibit stronger evidence of persistence.

There is a fairly large number of studies showing performance persistence of hedge funds is present in the short run. In one of the early studies, Agarwal & Naik (1999) find evidence that future performance can somewhat be predicted using past performance. However, consistent with literature on mutual funds, persistence is mainly explained by bad performers continuing to perform in a downward trend, rather than good performers continuing to perform well. Similarly, Agarwal & Naik (2000) find performance persistence in quarterly horizons, but not in half-yearly or yearly horizons. Eling (2009) examines 6186 funds and funds-of-funds from 1996 to 2005. His research confirms previous findings – performance persistence is present in shorter time horizons (6 months), becoming weaker as the time horizon increases. Boyson (2008) augments the previous literature by testing whether persistence varies with certain fund characteristics, such as size or age. By testing 3333 funds from 1994 to 2004, he finds that a portfolio of smaller, younger funds with good past performance are superior to that of older, larger funds with poor past performers by nearly 10% per year. Boyson (2008) explains the difference in returns by a phenomenon proposed by Berk & Green (2004); since investors chase past performance, good performing funds quickly reach bigger size, resulting in managers' skills being spread too thin, increased fees, and/or large trades impacting prices, all of which makes it more difficult for the fund to continue to outperform. Agarwal et al. (2004) further expands on the topic, testing how other fund characteristics correlate with future performance. Apart from confirming that investors chase good recent performers and that larger fund size is associated with poor future performance, Agarwal et al. (2004) also show that funds with higher managerial incentives, as well as longer lock-up and restriction periods, exhibit superior future performance. The results suggest that investors are compensated for the lack of liquidity associated with funds with those characteristics.

A number of more recent studies suggest hedge funds exhibit performance persistence in longer time horizons as well. In a database free of survivorship and backfill biases, Jagannathan, Malakhov, & Novikov (2010) find that good performing managers in the previous 3 years show higher tendency to have higher alphas in the next 3-year period. Contrary to most previous studies both on hedge funds and mutual funds, the authors find persistence in past winners rather than losers. However, it is important to note that the authors evaluate performance on a relative basis (compared to a peer group of managers of funds who pursue similar strategies), rather than gross, net, or risk-adjusted returns. Therefore, relative

performance persistence does not equal alpha, as the average performance of all hedge funds employing a certain strategy might be inferior to alternative strategies (Jagannathan et al., 2010, p. 218). Kosowski et al. (2007) conclude that the performance of top hedge funds from 1990 to 2002 cannot be attributed to luck alone. Moreover, managers who persistently outperform do so due to skill in selecting mispriced securities, not due to difference in fees or short-term serial correlation. The authors find positive performance is present in all hedge fund strategies, and persists both in the short run as well as in yearly horizons. Consistent with the previous literature, Kosowski et al. (2007) also find that funds with large inflows exhibit poor performance in the future. Long-term (one- to three-year) persistence in winning funds is also found by Yen, Hsu, & Hsiao (2015) in a sample of 13098 hedge funds from 1994 to 2008, among all strategies. In emerging markets, Strömquist (2007) find weak evidence of performance persistence at the one-year horizon. Interestingly, however, unlike in developed countries, the author finds that funds with good past performance do not receive higher capital inflows.

Even though most literature on hedge fund performance shows evidence of persistence, at least in the short run, a small number of studies contradict these findings. For example, Brown et al. (1999) show that past winners are not more likely to continue to be winners and vice versa. Next, the authors test for the relationship between size and future return, and, remarkably, find that size is unrelated to future performance. Malkiel & Saha (2005) perform a simple test for persistence by grouping funds as either winners or losers based on their last year's performance compared to the median, then examining whether they are winners or losers in the next year. They find very weak evidence of persistence in their sample from 1996-2003. These different findings regarding performance persistence can most likely be explained by different sample periods used, databases and potential biases contained within them, as well as statistical and econometric models used to test for it. In general, however, hedge funds seem to exhibit short-term performance persistence, with evidence regarding longer time horizons being more mixed.

4.4.3 Hedge fund performance during and after GFC

Hedge funds are advertised as being investment vehicles with low correlations to the overall market, as well as being able to achieve positive absolute returns regardless of the stage of business or economic cycle. Because they are not required to follow any benchmarks and have an extremely diverse range of strategies available to them, investors invest in HFs to hedge against downside risk and protect their assets in times of recession. As the previous

literature has shown, hedge funds have shown relatively good performance from the 1990s until the Global financial crisis. However, a disappointing performance of hedge funds during and after the crisis has shaken investors' confidence in them, an issue that is affecting the industry to this day. The following subchapter reviews the literature on hedge fund performance in times of recession, with a particular focus on the GFC.

Stofofos, Degiannakis, & Palaskas (2017) test hedge fund performance during economic downturns in the period from 1995 to 2014. The time frame includes the Asian crisis, the Internet bubble, the GFC and the European debt crisis. Even though the authors show that the risk-adjusted return of the hedge fund index was higher than the S&P 500 over the entire time period, they find no evidence that a typical hedge fund is able to hedge against systematic risk in times of crises. In only two strategies, Short selling and Macro, correlation to the market was not statistically significant, and those were also the only two strategies that were able to outperform the market during economic downturns. Stafylas, Anderson, & Uddin (2018) draw a similar conclusion. They find that during bad economic times hedge funds do not provide alphas and are instead focused on minimizing risk, investing in fewer asset classes and exposure to the market. Contrary to that, during expansions HFs focus on high returns by increasing systematic risk (beta), and the authors find positive alphas in all 11 hedge fund strategies in these periods. Fink et al. (2015) confirm these findings, showing that hedge funds do not outperform the market during recessions, even though the alpha of the entire period in the sample is positive.

In contrast to previous studies, some literature focused specifically on the GFC shows that hedge funds did outperform the market during the meltdown. According to Hammer & Shtekhman (2012) all hedge fund strategies have outperformed the equity market during the 2007-2009 economic downturn. However, only two of the nine categories achieved positive absolute returns. Ibbotson et al. (2011) match these results, finding positive alpha during the

Figure 10. Hedge fund net asset flows

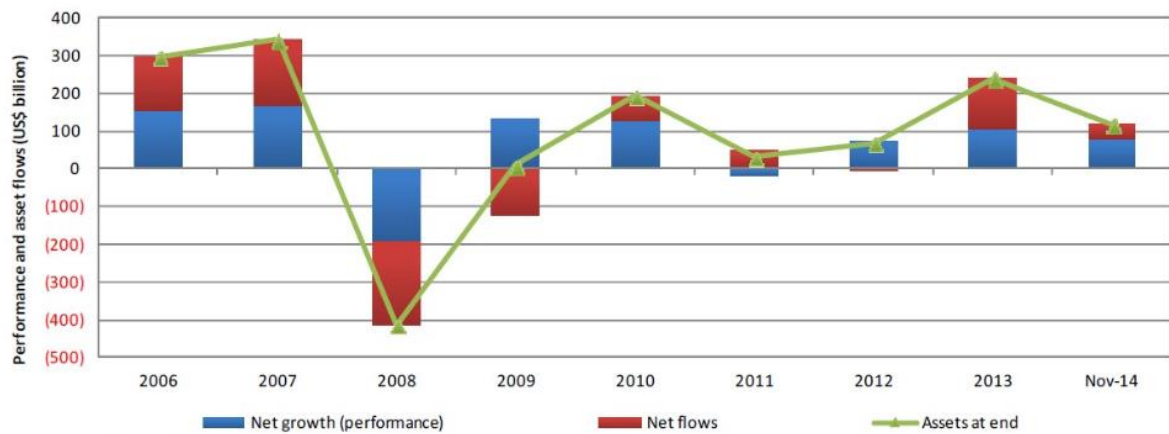


Figure 10. Net asset flows of hedge funds before, during and after the GFC (ValueWalk, 2015)

GFC, but also significantly negative absolute performance due to beta exposure. Hedge funds experienced a massive crisis of confidence and investor outflows as a result of the crisis. The image of HFs as investment vehicles with low or no correlation to the market was broken.

However, the GFC was only the beginning of bad times for the hedge fund industry.

Figure 11. Hedge fund performance

Not only did HFs fail to hedge against market risk during the crisis, they also utterly missed out on the opportunity to benefit from the stock market rebound that ensued from 2009 onwards. As Hammer & Shtekhman (2012) report, from March 2009 to December 2011, none of the HF categories were able to outperform the stock market, a 60% stock 40% bond portfolio, and some categories even underperformed bonds. A famous bet between Warren Buffet and a hedge fund manager illustrates how hedge funds overall have performed during the bull market after the GFC. The two investors wagered on which of the two will offer greater returns in the ten years starting at the end of 2007 - a passive index fund tracking the S&P 500, or a basket of hedge funds chosen by the manager. The following picture shows how an investment of \$10,000 would have performed over the ten years.

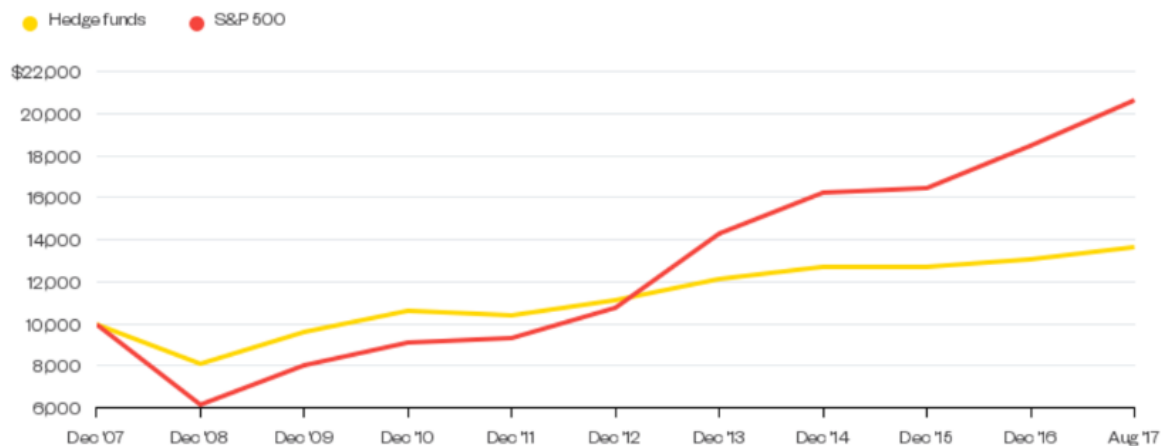


Figure 11. Hedge fund performance vs. the S&P 500 (Bloomberg, 2017)

As mentioned before, the S&P suffered major losses during the crisis, but outperformed the hedge funds each year thereafter, requiring approximately four years to take the lead in cumulative returns. By the end of 2017, the S&P 500 gained 125,8% (or 7.1% compounded annually) while the five hedge funds chosen by the manager gained 36% (or 2.2% compounded annually) (Wattles, 2018). The disappointing performance of hedge funds during the GFC, as well as the subsequent bull market, caused investors to doubt claims of superior manager skill and cast judgment on high fees charged by them. Furthermore, there is a debate whether hedge funds have become less “alternative” after the crisis and have started behaving more like high-fee mutual funds. Hammer & Shtekhman (2012) show that HFs do indeed show more correlation with the stock and bond markets since the GFC.

After facing the highest outflows since the financial crisis in 2016, hedge funds have

Figure 12. Hedge fund asset flows

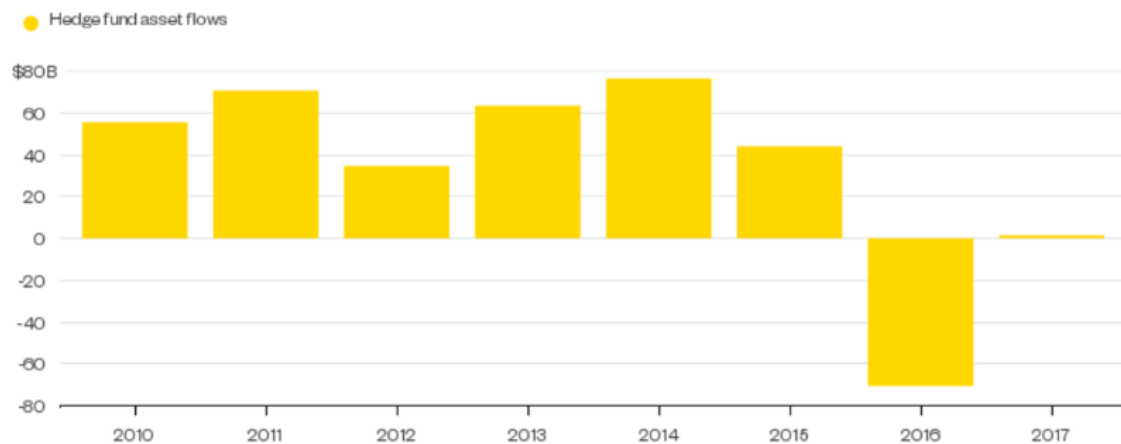


Figure 12. Hedge fund asset flows 2010-2017 (Bloomberg, 2017)

performed fairly well in recent times. In 2017, the industry as a whole produced returns of 8.5%, which was the best performance since 2013 (Financial Times, 2018). However, this number still pales in comparison to the staggering 22% returned by the S&P 500 in the same year. However, as of June 2018, both an asset-weighted and an equal-weighted HF index is outperforming the market, an achievement which has not happened since the years before the crisis (HFRI, 2018). It bears repeating that an index such as the S&P 500 is not necessarily a correct way to measure hedge fund performance, especially for non-equity strategies. Nevertheless, it is a positive sign for an industry faced with criticism over poor performance and high fees, that has struggled to justify its existence over the better part of the best decade.

In conclusion, research has produced mixed but reassuring results that hedge fund produced superior alphas in the second half of 1990s and the beginning of 2000s. As a result, the industry started growing rapidly and the strategies and opportunities HF managers were previously exploiting were spread among a much larger population, driving down the returns. A massive disappointment ensued during the 2008 GFC, when hedge funds, although falling less than the market, failed to protect investors from major losses. After the crisis, HF performance has been dismal, underperforming the S&P 500 each year in a bull market that lasts to this day.

4.5 Factor-based investing and smart beta

New developments in the asset management and ETF universe have made the lines between active and passive management become increasingly blurry. New investment

products are rapidly emerging which allow investors to combine certain elements of active investment, with more transparent and cost-efficient advantages that passive management offers (Clift, 2016, p. 34).

One example of such new products are the so-called smart beta or strategic beta funds. Smart beta funds, just like their passive counterparts, hold all securities in a particular market index, but claim to do so in a “smarter” way. SB proponents argue that traditional index funds, which weigh companies by market capitalization, provide investors with excessive exposure to the largest companies in the respective index, without taking into consideration other factors that might indicate outperformance potential. For instance, owning a fund passively tracking the S&P 500 would leave investors with a large exposure to growth stock in the technology sector, due to their disproportionate representation in the index. This might not necessarily be in the best interest of investors. Instead of market capitalization, smart beta funds weigh companies by different factors, such as value, momentum, volatility, quality, or any other factor the fund’s management think will yield long-term outperformance. This is why this strategy is often referred to as factor-based investing. By tilting the portfolios towards these factors, the goal of smart beta funds is to increase returns or decrease risk, in comparison to their market cap-weighted counterparts (Glushkov, 2016, p. 50) Unlike actively managed mutual funds, however, the weights and factors used are fully transparent and are presented in the fund’s prospectus. Therefore, although SB funds are more active than traditional index funds in the sense that a different weighting system is used and the portfolio is periodically rebalanced to reflect it, managers do not have discretionary powers. Although it can come in many forms, the primary delivery vehicle of factor-based investing are ETFs. Just like traditional cap-weighted passive funds, smart beta uses the liquidity, tax, transparency, and other benefits offered by ETFs.

Smart beta funds have dramatically risen in popularity over the last decade,

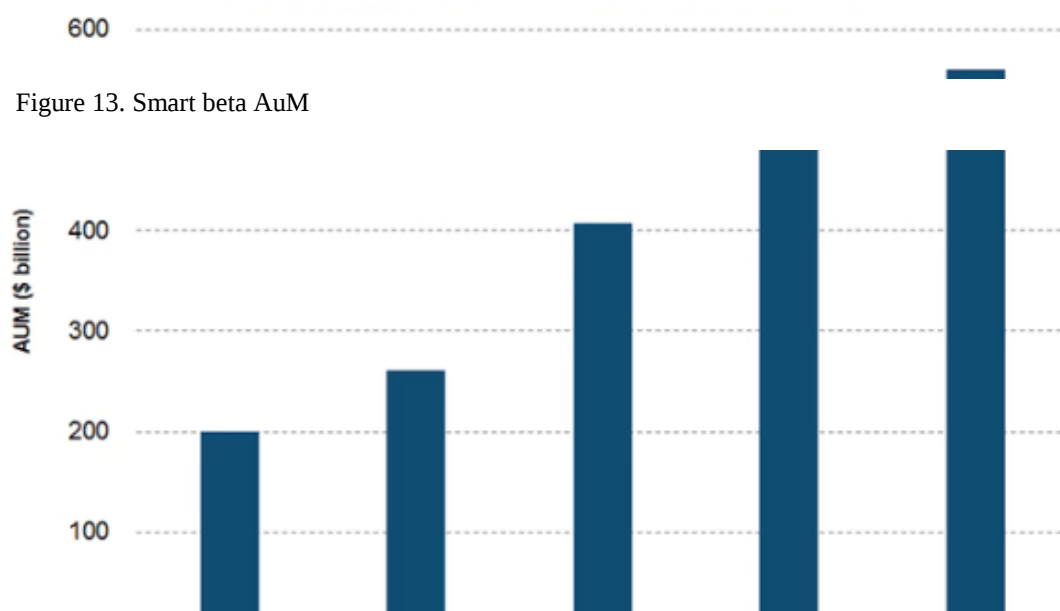


Figure 13. Smart beta AuM

Figure 13. Growth of smart beta AuM (MarketRealist, 2016)

particularly after investors suffered heavy losses during the GFC. They have surpassed the \$1 trillion AuM mark in 2017 and have had a staggering 30% growth in the last year alone (Financial Times, 2017).

Mutual funds and hedge funds are increasingly facing critique over high fees and underperformance, which is constantly demonstrated by financial literature. Smart beta funds, due to not requiring professional managers to constantly monitor the portfolio and perform security and market analysis, charge only a fraction of the fees traditional active management vehicles do. Still, because of the small degree of active management and transaction costs incurred when rebalancing the portfolio, SB funds on average charge 70% more (0.41 versus 0.24 basis points) than traditional index funds (Glushkov, 2016, p. 50). Since literature has shown that fees and costs are directly and negatively related to net returns, research is needed to conclude if SB funds offer enough added value to offset the higher cost and achieve excess returns. Due to their relative novelty in the asset management industry, there has not been an extensive amount of research done on the performance of smart beta funds. Nevertheless, all the relevant literature will be explored in the remainder of this chapter.

Stoneberg & Smith (2018) test six factors (quality, value, small tilt, momentum, low volatility, dividend yield) and five alternative weighting strategies (book value, total dividend, equal-weighted, low volatility, sales) from 1991 to 2017. They find that most factors and weighting strategies outperform the S&P 500 as well as the MSCI EAFE index on a risk-adjusted basis. Furthermore, the strategies showed to have lower downside risk than the traditional market-cap indexes. While it might be tempting to interpret the results of this study as proof of superiority of smart beta over traditional index funds, one important fact has to be taken into consideration. While related to each other, there is a significant empirical difference between factor portfolios and SB funds. Factor portfolios are theoretical portfolios, whose purpose is to capture a specific characteristic of stocks (such as size, B/M ratio) by being long stocks which exhibit this characteristic, and short stocks which do not. Smart beta funds, on the other hand, are actual investable products which try to capture these factors as their investment strategy. However, due to restrictions on shorting and leverage, SB funds are usually long-only funds, and transaction costs and other fees have to be included when evaluating their performance compared to cap-weighted benchmarks. Rabener (2017) shows that, while the value and growth factors exhibit a near-zero correlation with the S&P 500 index, the smart beta ETFs based on these factors have an extremely strong 0.99 correlation with the index. Thus, caution has to be exercised when trying to draw conclusions about the performance of smart beta strategies based on research on the underlying factors.

A study by Brightman & Shepherd (2017) clearly demonstrates this difference in the practical world. First, the authors construct hypothetical long-short portfolios exposed to six different factors: value, profitability, investment, size, low beta and momentum. For instance, a low-beta portfolio is long stocks with lower beta and short stocks with higher beta. They find that all six factors offer both statistically and practically significant returns. In fact, from 1973-2016 the average annualized excess return was 4.86% for the US, and similar for Japan, UK and Europe. After that, Brightman & Shepherd (2017) construct long-only smart beta portfolios that would be practically investable in, based on these factors. Even though, as expected, the real-world funds would underperform the hypothetical factor portfolios they are based on, the authors find an average of 2.19% per year excess return across the six smart beta strategies, with an average tracking error of 7.10%. The results are not as robust in Europe and Japan, where some strategies yielded negative returns, but with an average value added of 1% per year. The authors also note low or negative correlations between the different factors and propose combining them into a multi-factor portfolio, aiming to achieve similar returns at lower risk. Indeed, the standard deviation of smart beta portfolios can be reduced by more than 1% and tracking error in half by using a mix of all 6 factors. Brightman & Shepherd (2017) conclude that smart beta strategies can outperform the market on a risk-adjusted basis.

However, it is important to note two limitations concerning the previous study. The first one is that the research was sponsored by Research Affiliates, an investment company that offers smart beta products in their portfolio. The second one is that, although technically investable in the real world, the SB funds constructed by the authors were not actual funds that were in existence during this time period. Instead, the authors used backtesting to show how the funds would have performed, had they existed and employed the aforementioned strategies in a specific time period. This, combined with the previously mentioned limitation, raises concerns about the possible “massaging” of data in order to show desired results. Harvey, Liu, & Zhu (2016) use data mining to identify over 300 distinct factors that could be argued to explain stock returns in certain time periods. This shows limited usefulness of backtesting in order to predict future performance. Just like previous research has shown that stock market anomalies disappear soon after they are documented in financial literature, Mclean & Pontiff (2016) document the reduction of factor efficacy after publication as well.

A study by Glushkov (2016) attempts to overcome some of these limitations by using a sample of 164 existing US domestic equity SB ETFs between 2003 and 2014, . He groups the funds into 14 categories based on the common factors used. The results of this, most comprehensive and unbiased study on the performance of smart beta funds, are mixed.

Although many of the SB funds outperformed their benchmarks when measured by absolute returns, only value and volatility category did so on a risk-adjusted basis - the others underperformed. The average Sharpe ratio between all the SB funds is nearly identical to their cap-weighted benchmarks. Glushkov (2016) also tests the performance of smart beta ETFs against a tradeable passive benchmark which was created from existing cap-weighted market, size and value index funds. In this case, only the volatility SB category provided positive risk-adjusted returns. This casts doubt on whether periodic rebalancing, as a defining feature of smart beta, provides added value compared to simple passive funds that provide exposure to specific factors. Furthermore, the study shows mixed evidence that existing SB ETFs properly capture the factor premiums they are designed to capture. Although most funds do exhibit significant tilts towards the intended factors, in most cases they also show potentially unintended exposure to other factors which may work to offset potential benefits. Conditional analysis shows that several categories (quality, volatility, dividend) provide higher risk-adjusted returns than their cap-weighted benchmarks in times of economic recessions. However, those same categories considerably underperform their benchmarks in periods of economic growth. On the other hand, strategies that beat their cap-weighted benchmarks usually did so by assuming greater market risk (beta). Glushkov (2016) concludes that although SB strategies can improve risk-adjusted returns when added to a broad-based cap-weighted market index (such as the S&P 500 or Russell 3000), they do not provide any value when compared to their passive cap-weighted indexes aiming to capture the same factors.

It is crucial to note that Glushkov (2016) uses a single-factor CAPM in order to assess the performance of SB ETFs. Since the purpose of factor-based investing strategies is to utilize factors, apart from the market one, which are widely documented to drive stock returns, a question is raised whether smart beta funds can even theoretically achieve alpha. Malkiel (2014, p. 130) states that most, if not all, of “excess” returns achieved by smart beta funds are in fact due to assuming greater risk. For example, tilting the portfolio more toward smaller stocks will make it less diversified and riskier than the market portfolio, which is exactly the effect multi-factor models were designed to capture. Indeed, Malkiel finds that when assessed by multi-factor models, such as the Fama-French three-factor model and extensions of it, no alpha is found in SB funds. Asness (2006) also finds that empirical evidence of most SB strategies can be almost entirely attributed to value and size factors, which are key components of multi-factor models. In his paper, Glushkov summarizes the problem as follows:

Whether the potential outperformance by SB strategies should be interpreted as alpha or beta depends on the interpretation of the source of the factor premia these funds attempt to capture. If an investor interprets the factor return premia as compensation for non-market risk, then SB funds represent beta-risk portfolios offering risk exposure to rewarded factors. However, if an investor views the existence of the factor premia as a result of mispricings stemming from investors making systematic errors due to behavioral biases such as under/overreaction, extrapolation, anchoring, disposition, etc., then SB funds would be considered as adding alpha relative to single-factor passive benchmarks. Glushkov (2016, p. 53)

Research into smart beta fund performance is still in its relative infancy. Studies of real-world SB fund performance are scarce, and results from hypothetical factor-based investing strategies can often be misleading. Caution has to be exercised when using studies based on backtesting and data mining in order to predict how certain strategies will perform in the future. Malkiel (2014, p. 130) points out that performance of smart beta strategies varies greatly depending on the time frame used to test it. For example, value-oriented strategies performed particularly well in the aftermath of the Internet bubble, but underperformed since the GFC. Lastly, there is a discussion whether SB funds can even theoretically produce alpha, or is tilting towards certain factors exposing investors to additional risk which needs to be compensated for with higher returns. Therefore, an area of further research could be comparing the performance of SB funds with actively managed mutual funds, rather than passive index funds. By definition, passive investors earn an average return, therefore any under(over)performance of SB can only come as a result of equal over(under)performance of other types of active portfolio management.

5 Conclusions, discussions and suggestions for further research

The goal of this thesis was to analyze and evaluate existing literature in order to answer the question when, if ever, active investment strategies are superior to passive ones. All the primary active investment vehicles investing in various asset classes, geographical markets and in different economic conditions were covered. On the practical side, the conclusions of the thesis are aimed to help an average retail investor make educated decisions when investing savings in the capital markets.

Passive investing is predicated on a theory that markets are, in aggregate, at least semi-strong efficient. That implies they fully reflect all available information and any new information is instantly and correctly reflected in the price of securities. Under this hypothesis, neither technical nor fundamental analysis can successfully be used to consistently find mispricings and achieve excess returns. Therefore, the optimal strategy is to invest in a low-cost index fund and realize market return - beta. By contrast, proponents of active investing argue that markets are not fully efficient, and there are mispricing opportunities which can be exploited by skilled managers in order to achieve excess return - alpha. Since professional portfolio managers charge fees for their services, only outperformance of higher magnitude than the fees charged is considered superior to passive strategies. Over the years, academics and practitioners have identified certain anomalies in stock prices which serve as evidence against market efficiency. These include higher returns in the month of January or on certain days of the week, without any fundamental reason for such behavior. However, these anomalies have been arbitrated away soon after being documented in financial literature. Furthermore, many of them could not be exploited in practice, as any excess returns would be overshadowed by the transaction costs involved.

The most common form of active investment vehicles are mutual funds. Mutual funds pool funds from a large number of investors and invest them in a long-only portfolio of securities designed to beat a specified benchmark. Ever since the 1960s, literature has shown mutual funds in developed markets are not able to outperform the market. In other words, the managers do not, on average, possess enough security selection and timing skill to earn back the fees they charge. The findings have been nearly unanimous for markets such as the US, UK and other developed European countries across both bond and equity funds, in various time periods. Some literature shows evidence of performance persistence in the short run, but not in the long run. However, even if by using past returns investors are able to predict which

managers will perform better than an average fund in the future, it does not necessarily mean they will outperform the market. This is due to the fact that most research shows that negative performance is much more likely to persist than positive performance.

There is a significant gap in the literature concerning mutual fund performance in continental Europe, which offers one area of potential further research. Mutual funds in Europe constitute a much lower share of total AuM of the market when compared the US or UK. In theory, that implies professional portfolio managers have less skilled competition, making it easier to outperform. Apart from that, European markets have started to become more integrated over the past two decades, since the creation of the European Union. Further research is needed to compare, for instance, the performance of funds investing in their domestic market as opposed to pan-European ones. Most studies examining mutual fund performance use equal weights; constructing a portfolio consisting of all mutual funds in the sample, where each fund is represented in the same proportion. While this is a useful way of testing manager skill, it is not an accurate representation of the returns investors actually achieve. If investors have an ability to recognize skilled managers, more assets would flow to successful funds. Therefore, using asset-weighted rather than equal-weighted portfolios when testing the performance of mutual funds is another possible avenue of further research.

Some proponents of active investing argue that even though mutual funds may underperform on average, they protect investors' assets more successfully in down markets compared to index funds. Certain risk-averse investors are willing to pay with lower average return in order to achieve higher downside protection, especially in shorter time horizons. In theory, since fund managers' time and resources are limited, they choose to allocate them when it matters most to investors. That is usually in times of economic downturn and recession, when investors' marginal utility is highest. However, research concerning mutual performance in recessions is mixed. Although evidence evidence that mutual funds outperform the market during recessions certainly exists, it is extremely sensitive to the time period and particular recessions covered in the study. Apart from recessions, it is often argued mutual funds can outperform the market in emerging markets. EM are considered to be less efficient than developed markets, due to limited access to information and various restrictions for the use of shorting and derivatives. In theory, this would allow professional portfolio managers to more easily find mispriced securities and achieve abnormal returns. However, most literature shows that mutual funds are unable to outperform the benchmarks even in emerging markets. On the other hand, there is a much stronger case to be made for performance persistence, as many researchers find that some managers can consistently

outperform the market. There is also some evidence that local managers have higher returns than those of international funds investing in EM securities, especially in smaller cap stocks. This could be explained by informational advantages of knowing and understanding the local markets, industries and driving factors of the economy in a better way. What most literature does agree on is that EM funds provide diversification benefits due to being exposed to different factors and macroeconomic conditions which are often uncorrelated to the developed world. Thus, a portfolio consisting of primarily passive funds tracking developed market indexes may be improved in its risk-return profile by including some emerging market funds.

In regards to hedge fund research, there is a plethora of issues that make drawing conclusions concerning their performance difficult. Various data biases, such as survivorship bias and backfill bias, are prominent in HF studies due to their opaque nature and voluntary reporting standards. The choice of benchmark and models to use for performance evaluation is not clear, due to the immense number of strategies hedge funds use, and the fact they often offer returns uncorrelated to the market. Nevertheless, there is a substantial amount of evidence showing hedge funds provided higher risk-adjusted returns than passive indexes until the Global financial crisis. However, during the crisis HFs experienced heavy losses and failed to deliver on the promise of protection against negative market movements. This, combined with their dismal performance in the bull market that followed resulted in hedge funds falling out of favor recently and losing investor confidence. In terms of persistence, there is some evidence showing positive performance persists in short time frames of up to six months. However, a strategy of chasing past performance is practically impossible for hedge funds, as they require high initial investments and have lock-up and restriction periods preventing investors from withdrawing their funds for years at a time. What hedge funds do offer is diversification and downside protection benefits. Although not as market neutral as initially claimed, adding a diversified portfolio of hedge funds to a predominantly passive index portfolio would most likely decrease its volatility and offer hedging benefits in down markets.

Apart from hedge funds, another alternative route available to investors are smart beta funds. SB, or factor-based investing, is a relatively new strategy that appeared approximately a decade ago. It represents a unique mix of active and passive investing. Like passive funds, SB funds also invest in securities in an index. However, as opposed to value-weighted, like in a traditional index fund, the securities are weighted using different factors. These factors are designed to capture certain characteristics of stocks, such as growth, value, profitability, high dividend and others. Unlike actively managed funds, the managers do not have discretionary

powers over the portfolio. Instead, the factors on which the weightings are based are published *ex-ante* in the fund's prospectus and the portfolio is periodically rebalanced to match them. There is a debate whether returns realized as a result of exposure to these factors should be considered as alpha or beta. Since smart beta funds are fairly new, further research is needed in order to properly assess their performance compared to their value-weighted counterparts, as well as various active investment vehicles. Thus far, literature seems to show that SB funds do not offer greater risk-adjusted returns compared to traditional index funds.

Based on the research of this thesis, it is difficult to argue why a low-cost fund passively tracking a broad-based market index should not be the core of most investors' portfolios. This is especially true for longer investment horizons, where occasional market downturns are not a large concern. There is a case to be made that adding an emerging market or hedge fund component to a predominantly passive portfolio will provide diversification benefits and improve the risk/return profile. However, it should be noted that the findings of this thesis may change over time. Firstly, pressured by low costs of passive funds, average fees in the active management industry have been steadily decreasing over time. Since there is a significant amount of evidence showing that mutual funds and other active investment vehicles can outperform the market gross-of-fees, many studies reviewed in this thesis might have shown different results if repeated with lower expense ratios. Secondly, there is an argument that the rise in popularity of passive investing will lead to markets becoming less efficient. If more assets flow into passive funds, there would be fewer participants making trading decisions based on their insight and perception, and as a result making prices diverge from their fundamental values. This would enable skilled active investors to recognize and exploit these mispricings, allowing them to achieve abnormal returns.

6 References

- Abugri, B. A., & Dutta, S. (2009). Emerging market hedge funds: Do they perform like regular hedge funds? *Journal of International Financial Markets, Institutions and Money*, 19(5), 834–849. <https://doi.org/10.1016/j.intfin.2009.07.002>
- Ackermann, C., Mcenally, R., & Ravenscraft, D. (1999). The Performance of Hedge Funds Risk, Return, and. *The Journal of Finance*, LIV(3), 833–873.
- Agarwal, V., Daniel, N. D., & Naik, N. Y. (2004). *Flows , Performance , and Managerial Incentives in Hedge Funds*.
- Agarwal, V., & Naik, N. Y. (1999). On Taking the “Alternative” Route: Risks, Rewards, Style and Performance Persistence of Hedge Funds. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.150388>
- Agarwal, V., & Naik, N. Y. (2000). Multi-Period Performance Persistence Analysis of Hedge Funds. *The Journal of Quantitative Analysis*, 35(3), 327–342.
- Agrawal, A., & Tandon, K. (1994). Anomalies or Illusions - Evidence From Stock Markets in 18 Countries. *Journal of International Money and Finance*, 13(1), 83–106. [https://doi.org/10.1016/0261-5606\(94\)90026-4](https://doi.org/10.1016/0261-5606(94)90026-4)
- Ammann, M., & Moerth, P. (2008). Performance of funds of hedge funds. *Journal of Wealth Management*, 11(1), 46–63. <https://doi.org/10.2478/fofi-2013-0001>
- Ang, A., Rhodes-kropf, M., & Zhao, R. (2008). *Do Funds-of-Funds Deserve their Fees-on-Fees?* (NBER Working Paper Series).
- Ariel, R. A. (1987). A monthly effect in stock returns. *Journal of Financial Economics*, 18(1), 161–174. [https://doi.org/10.1016/0304-405X\(87\)90066-3](https://doi.org/10.1016/0304-405X(87)90066-3)
- Asness, C. (2006). The Value of Fundamental Indexing. Retrieved from <https://www.institutionalinvestor.com/article/b150nsjcm4ph3y/the-value-of-fundamental-indexing>
- Avramov, D., & Wermers, R. (2006). Investing in mutual funds when returns are predictable. *Journal of Financial Economics*, 81(2), 339–377. <https://doi.org/10.1016/j.jfineco.2005.05.010>
- Ball, R. (1978). Anomalies in relationships between securities’ yields and yield-surrogates. *Journal of Financial Economics*, 6(2–3), 103–126. [https://doi.org/10.1016/0304-405X\(78\)90026-0](https://doi.org/10.1016/0304-405X(78)90026-0)

- Banegas, A., Gillen, B., Timmermann, A., & Wermers, R. (2013). The cross section of conditional mutual fund performance in European stock markets. *Journal of Financial Economics*, 108(3), 699–726. <https://doi.org/10.1016/j.jfineco.2013.01.008>
- Banz, R. W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics*, 9(1), 3–18. [https://doi.org/10.1016/0304-405X\(81\)90018-0](https://doi.org/10.1016/0304-405X(81)90018-0)
- Barras, L., Scaillet, O., & Wermers, R. (2010). False Discoveries in Mutual Fund Performance: Measuring Luck in Estimated Alphas. *Journal of Finance*, LXV(1), 179–216.
- Basu, A. K., & Huang-Jones, J. (2015). The performance of diversified emerging market equity funds. *Journal of International Financial Markets, Institutions and Money*, 35, 116–131. <https://doi.org/10.1016/j.intfin.2015.01.002>
- Basu, S. (1977). Investment Performance of Common Stocks in Relation to their Price-Earnings Ratios: A Test of the Efficient Market Hypothesis. *The Journal of Finance*, 663–682.
- Basu, S. (1983). The Relationship Between Earnings' Yield, Market Value and Return for NYSE Common Stocks. *Journal of Financial Economics*, 12, 129–156.
- Berk, J. B., & Green, R. C. (2004). Mutual Fund Flows and Performance in Rational Markets. *Journal of Political Economy*, 112(6), 1269–1295. <https://doi.org/10.1086/424739>
- Bhardwaj, R. K., & Brooks, L. D. (1992). The January anomaly: Effects of low share price, transaction costs, and bid-ask bias. *The Journal of Finance*, 47(2), 553–575.
- Białkowski, J., & Otten, R. (2011). Emerging market mutual fund performance: Evidence for Poland. *North American Journal of Economics and Finance*, 22(2), 118–130. <https://doi.org/10.1016/j.najef.2010.11.001>
- Blake, C. R., Elton, E. J., & Gruber, M. J. (1993). The Performance of Bond Mutual Funds. *The Journal of Business*, 371–403.
- Blake, D., Caulfield, T., Ioannidis, C., & Tonks, I. (2017). New Evidence on Mutual Fund Performance: A Comparison of Alternative Bootstrap Methods. *Journal of Financial and Quantitative Analysis*, 52(3), 1279–1299. <https://doi.org/10.1017/S0022109017000229>
- Bloomberg. (2017). Hedge Funds Are Still in the Dumper Despite Better Flows.
- Bollen, N. P. B., & Busse, J. A. (2005). Short-term persistence in mutual fund performance. *Review of Financial Studies*, 18(2), 569–597. <https://doi.org/10.1093/rfs/hhi007>

- Boney, V., Comer, G., & Kelly, L. (2009). Timing the investment grade securities market: Evidence from high quality bond funds. *Journal of Empirical Finance*, 16(1), 55–69. <https://doi.org/10.1016/j.jempfin.2008.06.005>
- Boyce, E. (2018). Active v. Passive – Observations. Retrieved from <https://www.bkawealth.com/single-post/2018/02/06/Active-v-Passive---Observations>
- Boyson, N. M. (2008). Hedge fund performance persistence: A new approach. *Financial Analysts Journal*, 64(6), 27–44. <https://doi.org/10.2469/faj.v64.n6.6>
- Brealey, R., Myers, S. C., & Allen, F. (2010). *Principles of Corporate Finance*.
- Brightman, C., & Shepherd, S. (2017). A Smoother Path to Outperformance with Multi-Factor Smart Beta Investing, (January).
- Brooks, C., & Kat, H. M. (2001). The Statistical Properties of Hedge Fund Index Returns and Their Implications for Investors. *SSRN Electronic Journal*, 26–43.
- Brown, P., Kleidon, A. W., & Marsh, T. A. (1983). New evidence on the nature of size-related anomalies in stock prices. *Journal of Financial Economics*, 12(1), 33–56. [https://doi.org/10.1016/0304-405X\(83\)90026-0](https://doi.org/10.1016/0304-405X(83)90026-0)
- Brown, S. J., & Goetzmann, W. N. (1995). Performance Persistence. *The Journal of Finance*, 50(2), 679–698.
- Brown, S. J., Goetzmann, W. N., & Ibbotson, R. G. (1999). Offshore hedge funds: Survival and performance, 1989-95. *Journal of Business*, 72(72), 91–117. <https://doi.org/10.1086/209603>
- Bryman, A., & Bell, E. (2011). Business research methods. *Oxford University Press*, 806. <https://doi.org/10.1017/CBO9781107415324.004>
- Cajueiro, D. O., & Tabak, B. M. (2004). *Ranking efficiency for emerging markets* (Vol. 22). <https://doi.org/10.1016/j.chaos.2004.02.005>
- Carhart, M. M. (1997). On Persistence in Mutual Fund Performance. *The Journal of Finance*. <https://doi.org/10.2307/2329556>
- Chen, Y., Ferson, W., & Peters, H. (2010). Measuring the timing ability and performance of bond mutual funds. *Journal of Financial Economics*, 98(1), 72–89. <https://doi.org/10.1016/j.jfineco.2010.05.009>
- Chopra, N., Lakonishok, J., & Ritter, J. R. (1992). Measuring abnormal performance: Do stocks overreact? *Journal of Financial Economics*, 235–168. [https://doi.org/10.1016/0304-405X\(92\)90005-I](https://doi.org/10.1016/0304-405X(92)90005-I)

- Cici, G., & Gibson, S. (2010). The Performance of Corporate-Bond Mutual Funds : Evidence Based on Security-Level Holdings. <https://doi.org/10.2139/ssrn.1564486>
- Clift, T. (2016). Modern Investing Trends Reframe Active vs. Passive Debate. *Journal of Financial Planning*, 29(8), 34–35. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=117287404&site=ehost-live&scope=site>
- Cross, F. (1973). The Behavior of Stock Prices on Fridays and Mondays. *Financial Analysts Journal*, 29(6), 67–69. <https://doi.org/10.2469/faj.v29.n6.67>
- Cuthbertson, K., Nitzsche, D., & O’Sullivan, N. (2008). UK mutual fund performance: Skill or luck? *Journal of Empirical Finance*, 15(4), 613–634. <https://doi.org/10.1016/j.jempfin.2007.09.005>
- De Souza, A., & Lynch, A. W. (2012). *Does mutual fund performance vary over the business cycle? NBER Working Paper*. <https://doi.org/10.2139/ssrn.2085125>
- DeBondt, W. F. M., & Thaler, R. H. (1985). Does the Stock Market Overreact? *Journal of Finance*, 40(3), 793–805. <https://doi.org/10.1111/j.1540-6261.1985.tb05004.x>
- Dichev, I. D., & Yu, G. (2011). Higher risk, lower returns: What hedge fund investors really earn. *Journal of Financial Economics*, 100(2), 248–263. <https://doi.org/10.1016/j.jfineco.2011.01.003>
- Dietze, L. H., Entrop, O., & Wilkens, M. (2009). The performance of investment grade corporate bond funds: Evidence from the European market. *European Journal of Finance*, 15(2), 191–209. <https://doi.org/10.1080/13518470802588841>
- Eling, M. (2009). Does hedge fund performance persist? Overview and new empirical evidence. *European Financial Management*, 15(2), 362–401. <https://doi.org/10.1111/j.1468-036X.2008.00471.x>
- Eling, M., & Faust, R. (2010). The performance of hedge funds and mutual funds in emerging markets. *Journal of Banking and Finance*, 34(8), 1993–2009. <https://doi.org/10.1016/j.jbankfin.2010.01.008>
- Elton, E. J., Gruber, M. J., & Blake, C. R. (1995). Fundamental Economic Variables, Expected Returns, and Bond Fund Performance. *The Journal of Finance*, 50(4), 1229–1256.
- Fama, E. F. (1970). Efficient Capital Markets-A Review of Theory and Empirical Work. *The Journal of Finance*. <https://doi.org/10.2307/2329297>

- Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics*, 49(3), 283–306. [https://doi.org/10.1016/S0304-405X\(98\)00026-9](https://doi.org/10.1016/S0304-405X(98)00026-9)
- Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns.
- Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3–56. [https://doi.org/10.1016/0304-405X\(93\)90023-5](https://doi.org/10.1016/0304-405X(93)90023-5)
- Fama, E. F., & French, K. R. (2010). Luck versus Skill in the cross-section of mutual fund returns. *Journal of Finance*, 1915–1947.
- Ferson, W., Henry, T. R., & Kisgen, D. J. (2006). Evaluating government bond fund performance with stochastic discount factors. *Review of Financial Studies*, 19(2), 423–455. <https://doi.org/10.1093/rfs/hhj015>
- Financial Times. (2017). Smart beta funds pass \$1tn in assets. Retrieved from <https://www.ft.com/content/bb0d1830-e56b-11e7-8b99-0191e45377ec>
- Financial Times. (2018). Hedge funds produce best returns in 4 years.
- Fink, C., Raatz, K., & Weigert, F. (2015). Do Mutual Funds Outperform during Recessions? International (Counter-)Evidence.
- French, K. R. (1980). Stock returns and the weekend effect. *Journal of Financial Economics*, 8(1), 55–69. [https://doi.org/10.1016/0304-405X\(80\)90021-5](https://doi.org/10.1016/0304-405X(80)90021-5)
- Fung, W., & Hsieh, D. a. (2000). Performance Characteristics of Hedge Funds and Commodity Funds: Natural vs. Spurious Biases. *Journal of Financial and Quantitative Analysis*, 35(3), 291–307. <https://doi.org/10.2307/2676205>
- Fung, W., & Hsieh, D. A. (2004). Hedge fund benchmarks: A risk-based approach. *Financial Analysts Journal*, 60(5), 65–80. <https://doi.org/10.2469/faj.v60.n5.2657>
- Fung, W., Hsieh, D. A., Naik, N. Y., & Ramadorai, T. (2008). Hedge Funds: Performance, Risk, and Capital Formation. *The Journal of Finance*, 63(4), 1777–1803. <https://doi.org/10.1111/j.1540-6261.2008.01374.x>
- Globe, V. (2011). Why mutual funds “underperform.” *Journal of Financial Economics*, 99(3), 546–559. <https://doi.org/10.1016/j.jfineco.2010.10.008>
- Glushkov, D. (2016). How Smart Are Smart Beta Exchange-Traded Funds: Analysis of Relative Performance and Factor Exposure. *The Journal of Investment Consulting*, 17(1). Retrieved from https://imca.org/sites/default/files/current-issues/JICMastersInterviews/JIC101_MastersSeriesMarkowitz.pdf

- Gottesman, A. A., & Morey, M. R. (2007). Predicting Emerging Market Mutual Fund Performance. *Journal of Investing*, 16(3), 111–122. Retrieved from <http://libproxy.tulane.edu:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=26502244&site=ehost-live&scope=site>
- Gruber, M. J. (1996). Another Puzzle : The Growth in Actively Managed Mutual Funds. *Finance*, 51(3), 783–810. <https://doi.org/10.2307/2329222>
- Gultekin, M. N., & Gultekin, N. B. (1983). Stock market seasonality. International Evidence. *Journal of Financial Economics*, 12(4), 469–481. [https://doi.org/10.1016/0304-405X\(83\)90044-2](https://doi.org/10.1016/0304-405X(83)90044-2)
- Gutierrez, R. C., & Maxwell, W. F. (2008). *Persistent Performance in Corporate-Bond Mutual Funds*.
- Hammer, S. D., & Shtekhman, A. (2012). *A mixed bag : Performance of hedge fund categories during and after the financial crisis*.
- Harvey, C. R., Liu, Y., & Zhu, H. (2016). ... and the Cross-Section of Expected Returns. *Review of Financial Studies*, 29(1), 5–68. <https://doi.org/10.1093/rfs/hhv059>
- Hedge Fund Marketing. (2017). Hedge Fund Assets Under Management Reach New High. Retrieved from <http://www.hedgefundmarketing.org/hedge-fund-assets-under-management-reach-new-high/>
- Hendricks, D., Patel, J., & Zeckhauser, R. (1993). Hot Hands in Mutual Funds: Short-Run Persistence of Relative Performance, 1974-1988. *The Journal of Finance*, 48(1), 93–130.
- Henriksson, R. D. (1984). Market Timing and Mutual Fund Performance: An Empirical Investigation. *The Journal of Business*, 57(1), 73. <https://doi.org/10.1086/296225>
- HFRI. (2018). HFRI® Indices Performance Tables.
- Huang, J.-Z., & Wang, Y. (2014). Timing Ability of Government Bond Fund Managers: Evidence from Portfolio Holdings. *Management Science*, 60(8), 2091–2109. <https://doi.org/10.1287/mnsc.2013.1843>
- Huij, J., & Derwall, J. (2008). “Hot Hands” in bond funds. *Journal of Banking and Finance*, 32(4), 559–572. <https://doi.org/10.1016/j.jbankfin.2007.04.023>
- Huij, J., & Post, T. (2011). On the performance of emerging market equity mutual funds. *Emerging Markets Review*, 12(3), 238–249. <https://doi.org/10.1016/j.ememar.2011.03.001>
- Ibbotson, R. G., Chen, P., & Zhu, K. X. (2011). The ABCs of hedge funds: Alphas, betas, and

- costs. *Financial Analysts Journal*, 67(1), 15–25. <https://doi.org/10.2469/faj.v67.n1.6>
- IMF. (2016). *Too Slow for Too Long. World Economic Outlook April 2016*.
- Investment Company Institute. (2018). *Investment Company Fact Book*.
- Ippolito, R. A. (1989). Efficiency With Costly Information: A Study of Mutual Fund Performance. *The Quarterly Journal of Economics*, 108(1), 1–23.
- Jaffe, J. F., Keim, D. B., & Westerfield, R. (1989). Market Values, Earnings' Yields and Stock Returns. *The Journal of Finance*, 14(1), 135–148.
- Jaffe, J. F., & Westerfield, R. (1985). The Week-End Effect in Common Stock Returns: The International Evidence. *Journal of Finance*, 40(2), 433–454. Retrieved from <http://econpapers.repec.org/RePEc:bla:jfinan:v:40:y:1985:i:2:p:433-54>
- Jagannathan, R., Malakhov, A., & Novikov, D. (2010). Do Hot Hands Persist Among Hedge Fund Managers? An Empirical Evaluation. *The Journal of Finance*, LXV(1), 217–255. <https://doi.org/10.1111/j.1540-6261.2009.01528.x>
- Jegadeesh, N., & Titman, S. (1993). Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency. *Journal of Finance*, 48(1), 65–91. <https://doi.org/10.2307/2328882>
- Jensen, M. C. (1968). The Performance of Mutual Funds in the Period 1945-1964.
- Keim, D. B. (1983). Size-related anomalies and stock return seasonality. Further empirical evidence. *Journal of Financial Economics*, 12(1), 13–32. [https://doi.org/10.1016/0304-405X\(83\)90025-9](https://doi.org/10.1016/0304-405X(83)90025-9)
- Kiyamaz, H., & Simsek, K. D. (2017). The performance of US-based emerging market mutual funds. *Journal of Capital Markets Studies*, 1(1), 58–73. <https://doi.org/10.1108/JCMS-10-2017-003>
- Kosowski, R. (2011). Do Mutual Funds Perform When It Matters Most to Investors? US Mutual Fund Performance and Risk in Recessions and Expansions. *Quarterly Journal of Finance*, 01(03), 607–664. <https://doi.org/10.1142/S2010139211000146>
- Kosowski, R., Naik, N. Y., & Teo, M. (2007). Do hedge funds deliver alpha? A Bayesian and bootstrap analysis. *Journal of Financial Economics*, 84(1), 229–264. <https://doi.org/10.1016/j.jfineco.2005.12.009>
- Kosowski, R., Timmermann, A., Wermers, R., & White, H. (2006). Can mutual fund “stars” really pick stocks? New evidence from a bootstrap analysis. *Journal of Finance*, 61(6), 2551–2595. <https://doi.org/10.1111/j.1540-6261.2006.01015.x>

- Kotkatvuori-Örnberg, J., Nikkinen, J., & Peltomäki, J. (2011). Geographical focus in emerging markets and hedge fund performance. *Emerging Markets Review*, 12(4), 309–320. <https://doi.org/10.1016/j.ememar.2011.05.001>
- Kremnitzer, K. (2012). Comparing Active and Passive Fund Management in Emerging Markets. *University of California, Berkeley*, 1–43.
- Laes, M. A., & Silva, M. E. da. (2014). Performance of mutual equity funds in Brazil – A bootstrap analysis. *EconomiA*, 15(3), 294–306. <https://doi.org/10.1016/j.econ.2014.08.002>
- Lai, M. M., & Lau, S. H. (2010). Evaluating mutual fund performance in an emerging Asian economy: The Malaysian experience. *Journal of Asian Economics*, 21(4), 378–390. <https://doi.org/10.1016/j.asieco.2010.03.001>
- Lakonishok, J., & Levi, M. (1985). Weekend Effects on Stock Returns: A Reply. *The Journal of Finance*, 40(1), 351–352. <https://doi.org/10.1111/j.1540-6261.1985.tb04957.x>
- Lakonishok, J., Shleifer, A., & Vishny, R. W. (1994). Contrarian Investment, Extrapolation, and Risk. *The Journal of Finance*, 49(5), 1541–1578. <https://doi.org/10.1111/j.1540-6261.1994.tb04772.x>
- Lakonishok, J., & Smidt, S. (1988). Are Seasonal Anomalies Real? A Ninety-Year Perspective. *The Review of Financial Studies*, 403–425.
- Lehmann, B. N. (1990). Fads, martingales, and market efficiency. *The Quarterly Journal of Economics*, 105(1), 1–28.
- Leite, P., & Armada, M. R. (2016). Bond Fund Performance During Recessions and Expansions: Empirical Evidence from a Small Market. *International Review of Finance*, (April), 1–11. <https://doi.org/10.1111/ir>
- Lemeshko, O., & Rejnuš, O. (2015). Performance Evaluation of Equity Mutual Funds in Countries with Emerging Economies: Evidence from BRIC, CEE, sea and MENA Regions. *Procedia Economics and Finance*, 30(15), 476–486. [https://doi.org/10.1016/S2212-5671\(15\)01315-5](https://doi.org/10.1016/S2212-5671(15)01315-5)
- Lesmond, D. A., Schill, M. J., & Zhou, C. (2004). The illusory nature of momentum profits. *Journal of Financial Economics*, 71(2), 349–380. [https://doi.org/10.1016/S0304-405X\(03\)00206-X](https://doi.org/10.1016/S0304-405X(03)00206-X)
- Malkiel, B. G. (1995). Returns from Investing in Equity Mutual Funds 1971 to 1991. *The Journal of Finance*, 50(2), 549–572. <https://doi.org/10.1111/j.1540-6261.1995.tb04795.x>

- Malkiel, B. G. (2003). The Efficient Market Hypothesis and Its Critics. *Journal of Economic Perspectives*, 17(1), 59–82. <https://doi.org/10.1257/089533003321164958>
- Malkiel, B. G. (2014). Is Smart Beta Really Smart? *The Journal of Portfolio Management*, 40(5), 127–134. <https://doi.org/10.3905/jpm.2014.40.5.127>
- Malkiel, B. G., & Saha, A. (2005). Hedge Funds: Risk and Return. *Financial Analysts Journal*, 61(6), 80–88. Retrieved from <http://www.cfapubs.org/doi/abs/10.2469/faj.v61.n6.2775>
- María Cáceres Apolinario, R., Maroto Santana, O., Jordán Sales, L., & Rodríguez Caro, A. (2006). Day of the Week Effect on European Stock Markets. *International Research Journal of Finance and Economics*, ISSN(2), 1450–2887. Retrieved from <http://www.eurojournals.com/finance.htm>
- MarketRealist. (2016). Smart Beta ETFs: A Way to Combine Selectivity and Diversification.
- McConnell, J. J., & Wei, X. (2008). Equity returns at the turn of the month. *Financial Analysts Journal*, 64(2), 49–64. <https://doi.org/10.2469/faj.v64.n2.11>
- Mclean, R. D., & Pontiff, J. (2016). Does Academic Research Destroy Stock Return Predictability? *Journal of Finance*, 71(1), 5–32. <https://doi.org/10.1111/jofi.12365>
- Michelson, S., Philipova, E., & Srotova, P. (2008). The Case for Emerging Market Funds. *Journal of Business and Economics Research*, (June), 81–88. <https://doi.org/10.19030/jber.v6i11.2492>
- Moneta, F. (2015). Measuring bond mutual fund performance with portfolio characteristics. *Journal of Empirical Finance*, 33, 223–242. <https://doi.org/10.1016/j.jempfin.2015.03.012>
- Moskowitz, T. J. (2000). Discussion: Mutual Fund Performance: An Empirical Decomposition Into Stock-Picking Talent, Style, Transaction Costs, and Expenses. *Journal of Finance*, 1695–1703. <https://doi.org/10.1086/294846>
- Movassaghi, H., Bramhandkar, A., & Shikov, M. (2004). “ Emerging ” vs . “ Developed ” Markets Closed-End Funds : A Comparative Performance Analysis. *Managerial Finance*, 30(3), 51–61.
- Nguyen, L. H. (2010). Return in Investing in Equity Mutual Funds from 1990 to 2009, 55–72.
- Odean, T. (1999). Do Investors Trade too Much? *American Economic Review*, 1279–1298.
- Otten, R., & Bams, D. (2002). European mutual fund performance. *European Financial Management*, 8(1), 75–101. <https://doi.org/10.1111/1468-036X.00177>

- Petticrew, M., & Roberts, H. (2006). *Systematic Reviews in the Social Sciences: A Practical Guide*. Cebma.Org. <https://doi.org/10.1027/1016-9040.11.3.244>
- Polwitoon, S., & Tawatnuntachai, O. (2008). Emerging Market Bond Funds: A Comprehensive Analysis. *The Financial Review*, 2000(4), 51–58. <https://doi.org/10.2469/cp.v2000.n4.3036>
- Premaratne, G., & Mensah, J. O. (2014). *Performance of Asian Mutual Funds. Handbook of Asian Finance: REITs, Trading, and Fund Performance* (Vol. 2). Elsevier Inc. <https://doi.org/10.1016/B978-0-12-800986-4.00023-6>
- Prequin. (2018). *2018 Prequin Global Hedge Fund Report*. <https://doi.org/978-1-907012-88-4>
- PwC. (2014). Asset Management 2020: A Brave New World. Retrieved from <https://www.pwc.com/gx/en/asset-management/publications/pdfs/pwc-asset-management-2020-a-brave-new-world-final.pdf>
- Rabener, N. (2017). Smart Beta VS Factors in Portfolio Construction. Retrieved from <https://www.factorresearch.com/research-smart-beta-vs-factor-in-portfolio-construction>
- Rao, Z.-R., Tauni, M. Z., Iqbal, A., & Umar, M. (2017). Emerging market mutual fund performance: evidence for China. *Journal of Asia Business Studies*, 11(2), 167–187. <https://doi.org/10.1108/JABS-10-2015-0176>
- Reinganum, M. R. (1981). Misspecification of capital asset pricing: Empirical anomalies based on earnings' yields and market values. *Journal of Financial Economics*, 9(1), 19–46. [https://doi.org/10.1016/0304-405X\(81\)90019-2](https://doi.org/10.1016/0304-405X(81)90019-2)
- Reinganum, M. R. (1983). The anomalous stock market behavior of small firms in January. *Journal of Financial Economics*, 12(1), 89–104. [https://doi.org/10.1016/0304-405X\(83\)90029-6](https://doi.org/10.1016/0304-405X(83)90029-6)
- Risso, W. A. (2009). The informational efficiency: The emerging markets versus the developed markets. *Applied Economics Letters*, 16(5), 485–487. <https://doi.org/10.1080/17446540802216219>
- Rozeff, M. S., & Kinney, W. R. (1976). Capital market seasonality: The case of stock returns. *Journal of Financial Economics*, 3(4), 379–402. [https://doi.org/10.1016/0304-405X\(76\)90028-3](https://doi.org/10.1016/0304-405X(76)90028-3)
- S&P Dow Jones Indices. (2017). *Does Past Performance Matter? The Persistence Scorec*.
- Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3), 425–442. <https://doi.org/10.2307/2329297>

- Silva, F., Cortez, M. do C., & Armada, M. R. (2003). Conditioning Information and European Bond Fund Performance. *European Financial Management*, 9(2), 201–230.
<https://doi.org/10.1111/1468-036X.00216>
- Sinha, N. R. (2016). *Underreaction to News in the US Stock Market*. *Quarterly Journal of Finance* (Vol. 06). <https://doi.org/10.1142/S2010139216500051>
- Stafylas, D., Anderson, K., & Uddin, M. (2018). Hedge fund performance attribution under various market conditions. *International Review of Financial Analysis*, 56(January), 221–237. <https://doi.org/10.1016/j.irfa.2018.01.006>
- Statista. (2018). Total net assets of mutual funds in the United States from 1998 to 2017 (in trillion U.S. dollars). Retrieved from <https://www.statista.com/statistics/255518/mutual-fund-assets-held-by-investment-companies-in-the-united-states/>
- Stofofos, C. E., Degiannakis, S., & Palaskas, T. B. (2017). Hedge fund returns under crisis scenarios: A holistic approach. *Research in International Business and Finance*, 42, 1196–1207. <https://doi.org/10.1016/j.ribaf.2017.07.056>
- Stoneberg, J., & Smith, B. (2018). *Getting smart about beta*.
- Strömquist, M. (2007). *Should You Invest in Emerging Market Hedge Funds?* Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=985547
- Sun, Z., Wang, A., & Zheng, L. (2009). Do Active Funds Perform Better in Down Markets? New Evidence from Cross-Sectional Study, (949). <https://doi.org/10.2139/ssrn.1474083>
- Sushko, V., & Turner, G. (2018). The Implications of Passive Investing for Securities Markets. *BIS Quarterly Review*, (March), 113–131. Retrieved from https://www.bis.org/publ/qtrpdf/r_qt1803j.pdf
- Szakmary, A. C., & Kiefer, D. B. (2004). The disappearing January/turn of the year effect: Evidence from stock index futures and cash markets. *Journal of Futures Markets*, 24(8), 755–784. <https://doi.org/10.1002/fut.20103>
- Uman, L. S. (2011). Systematic Reviews and Meta-Analyses. *The Canadian Academy of Child and Adolescent Psychiatry*, (February), 57–59.
- ValueWalk. (2015). Global Hedge Fund AUM Touches \$2.3 Trillion. Retrieved from <https://www.valuwalk.com/2015/01/global-hedge-fund-aum/>
- Vanguard. (2015). What is ‘survivorship bias’ and why does it matter? *Vanguard*, (March), 1–4. Retrieved from <https://www.vanguard.co.uk/documents/adv/literature/survivorship-bias.pdf>

- Vidal-García, J. (2013). The persistence of European mutual fund performance. *Research in International Business and Finance*, 28(1), 45–67.
<https://doi.org/10.1016/j.ribaf.2012.09.004>
- Wattles, J. (2018). Warren Buffett beat the hedge funds. Here's how. Retrieved from
<http://money.cnn.com/2018/02/24/investing/warren-buffett-annual-letter-hedge-fund-bet/index.html>
- Wermers, R. (1997). Momentum Investment Strategies of Mutual Funds, Performance Persistence, and Survivorship Bias. *Unpublished Working Paper, University of Colorado*, [...], (1996), 1–29. Retrieved from
[http://jpkc.whu.edu.cn/jpkc2003/investment/kcwz/wxxd/art%5CM%5Cmomentum investment strategies,mutual funds.pdf](http://jpkc.whu.edu.cn/jpkc2003/investment/kcwz/wxxd/art%5CM%5Cmomentum%5Cinvestment%5Cstrategies%5Cmutual%5Cfunds.pdf)
- Wermers, R. (2000). Mutual fund performance: An empirical decomposition into stock picking talent, style, transactions costs, and expenses. *The Journal of Finance*, 55(4), 1655–1695. <https://doi.org/10.1111/0022-1082.00263>
- Yen, S. M. F., Hsu, Y. L., & Hsiao, Y. L. (2015). Can hedge fund elites consistently beat the benchmark? A study of portfolio optimization. *Asia Pacific Management Review*, 20(4), 275–284. <https://doi.org/10.14257/ijasia.2015.9.7.08>

