GARP OUTPERFORMANCE OVER GROWTH: TOWARDS AN OLD AND A NEW PARADIGM

by

<Frederik Marcel Bossens, BSc in Business Administration, MSc in Management>

DISSERTATION

Presented to the Swiss School of Business and Management Geneva

In Partial Fulfillment

Of the Requirements

For the Degree

DOCTOR OF BUSINESS ADMINISTRATION

SWISS SCHOOL OF BUSINESS AND MANAGEMENT GENEVA

OCTOBER, 2024

GARP OUTPERFORMANCE OVER GROWTH: TOWARDS AN OLD AND A NEW PARADIGM

by

Frederik Marcel Bossens

APPROVED BY

Dissertation chair - Dr. Gualdino Cardoso

RECEIVED/APPROVED BY:

Admissions Director

Dedication

This research is dedicated to my mom and dad who have supported me throughout all illness and success, throughout all of my life, and all of my studies. Without their support, conducting all of my studies, courses, certificates and degrees, which have been abundant, would never have been possible.

I also dedicate this research to my infant nephews, Frans, Cesar, and Leon, who represent hope to me.

Acknowledgements

I must thank my supervisor, Dr. Apostolos Dasilas, for his hard work, prompt responses, honesty and good advice, resulting in completing my work at a fast pace. Special thanks to all the teachers, teaching-assistants, and professors throughout my life, without your patience and guidance, I would not be here.

ABSTRACT

GARP OUTPERFORMANCE OVER GROWTH: TOWARDS AN OLD AND A NEW PARADIGM

Frederik Marcel Bossens
2024

Value investing and growth investing are two forms of investing. Previous research demonstrates that value outperforms growth. This paradigm has been broadly supported in literature. GARP is another form of investment that was forgotten in the paradigm. GARP needs to be introduced in that paradigm. According to literature, it is expected that GARP will outperform growth but not value. Therefore, the purpose of this study is to complete the paradigm by demonstrating GARP's outperformance over growth and underperformance compared to value. However, researchers have noticed large-scale changes in performance that started occurring around the Great Financial Crisis. Growth seems to have started outperforming value, in contradiction to the traditional value outperforming growth paradigm. However, there are still mixed findings around the world on whether growth or value outperforms. A global model for outperformance is therefore needed. A major part of this research is aimed at testing the changes in outperformance, and setting up GARP's place in the new paradigm, where growth now seems to outperform value. For the first period, it turns out that value and GARP outperform growth about as much in the period before the GFC, both in developing and emerging markets. However, there is no outperformance of growth, value, nor GARP in

the second period, except in emerging markets. It is evident that the old paradigm of value outperforming growth in the period before the GFC, can be completed by introducing a GARP strategy that will be roughly as strong, in outperforming growth, as value. However, for the period starting in the GFC, tech companies performance was flat for all strategies in developed markets. However, in emerging markets, there are still huge profits to be made by tangible asset based value and GARP companies, the evidence shows the outperformance of GARP and the performance of value that is similar to the old paradigm. Hence, it becomes more important for investors to move towards emerging markets to have statistical backing. These tangible asset based value and GARP companies form the basis for what can be called the new paradigm of outperformance of GARP and value over growth, that has shifted to the emerging markets. In this study, all of this was proven by a battery of nineteen tests, with the testing of the outperformance as the most important test, while others, including paired t-tests, correlation analyses, F-tests, covariance tests, Phillips-Oullaris tests, and outliers tests, were used to provide more knowledge and reliability to the findings.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I:

INTRODUCTION

1.1 Introduction

The primary goal of every investor is to make money. Traditionally, this has mostly been done by value investing, because there is a value premium (Fama and French, 2021). Value investing outperforms growth investing (Fama and French, 1998). Value investing is often based on buying stocks at low prices, such as high B/M, while growth is the opposite, it is based on paying high prices such as low B/M (Fama and French, 1998). It turns out that this isn't entirely true, not all growth investors buy glamour, but also care about the price they pay for growth (Ang and Chng, 2013). Hence, there is a third way of investing, that is, mixing growth with value, this is GARP or growth at a reasonable price (Lynch and Rothchild, 1994; Lynch and Rothchild, 2000; Wirawan and Sumirat, 2021).

It is unclear how GARP performs, that is, relative to value and growth and there are indications that it used to trail value, but now it outperforms both value and growth. To discover the answer to this question, it is first needed to go back in time and discover how GARP performed before market shaking conditions that started in 2007. Growth suddenly beat value for at least over 13 years (Arnott et al., 2021). This had never occurred before. There is a debate on the matter of whether this change is permanent or not (Cornell and Damodaran, 2021), but many value investors have thrown in the towel and recommend growth be bought for reasonable prices (Greenwald et al., 2020). Hence, GARP becomes the new way of investing. To answer whether GARP outperforms value

and growth and notice the change from the old ways of doing things into a new paradigm, it is first needed to complete the old paradigm, that is, to place GARP in the value outperforming growth paradigm. Then, it is needed to construct a new paradigm, for investors to abide by. There is a clear need for this to be executed on a global basis since different markets outperform in different time periods and there are differences across market about which style outperforms in what time period.

The implications for industry practice are vast. Institutional investors, investment banks, growth funds, traditional value funds, and individual investors would all agree outperformance is the key ingredient for their investment success. When GARP outperforms, most rational investors would switch from a traditional value or growth approach to a GARP approach.

Analysts would have to specialize in GARP, instead of growth or value. Training would be entirely focused on GARP skills and knowledge, value, and growth. New jobs would be created.

Academic researchers could expand their knowledge of the new paradigm. When there is a new paradigm, there is much room for exploration by building new theories around the new paradigm. A paradigm is a new way of thinking, hence it must lead to a strand of theories and further refinements. This must lead to more citations. For example, the old Fama and French (1998) value outperforming growth paradigm article was cited 3758 times according to Google Scholar at the time of writing (Google Scholar, 2024).

1.2 Research Problem

Whether GARP outperforms value and growth across markets remains unknown. There are two main periods that are of interest. The first is when value outperforms growth (Fama and French, 1998), that is the period until 2007, because starting 2007 growth starts to outperform value (Arnott et al. 2021). In the first period, GARP's performance relative to growth and value is unknown. In the second period, the relative performance on a global basis also remains unknown as well. The place of GARP in this old paradigm might have shifted in the new paradigm as well. It must be understood how GARP fits within these paradigms because it is important to know whether GARP outperforms growth and/or value and how GARP fits within an outperformance theory. The main purpose of investing remains making money. Risking money for less profit when otherwise more profit is available, given no other concerns such as ESG factors are present, is futile. Hence, if GARP performs better than either value or growth, it is something the whole investment community, from large financial institutions, and fund managers to individual investors, would want to know since their main goal is making more money. However, there is no current research that introduces GARP in the value versus growth outperformance theory initially started by Fama and French (1998).

1.3 Research rationale

Through years and years of diligent study and practice of the combining of value and growth or GARP, it has become evident and absolutely clear to the author of this study that GARP is a genuine high performing investment strategy as the author of this study has experienced vividly in practice and in theory. Greenwald et al. (2004; 2020) have

made it absolutely clear that combining value and growth is a genuine investment strategy. In theory, however, value has always outperformed growth as Fama and French (1998) demonstrate. However, GARP is completely forgotten. Including GARP in this paradigm has been completely forgotten, while it is a worthwhile strategy. This is a theoretical void.

But lately, value seems to underperform. A number of changes seem to have emerged that reduce its performance (Greenwald et al., 2020). This is less understood in the market, by the author of this study as well. Clarification about the performance of value and GARP in this context, relative to growth, and integrating this in the context of the Fama and French (1998) paradigm, is the second reason for researching this, since there is a knowledge gap between the historical place of GARP in this paradigm and the what seems to be an emerging place of GARP in a new paradigm, given the changes in the market.

It is through practical experience that this has become evident to the researcher. Solving these issues provide substantial theoretical underpinning for the GARP practitioner's approach. This might prove that GARP is as good as value or even better. This might lead to more practitioners and investors knowing this strategy is as good or even better of an approach as value, compared to growth. Thereby, theory and practice are enhanced.

1.4 Aims, objectives and questions

This research aims to assess the place of GARP in the paradigm of value outperforming growth. GARP is expected to outperform growth, but underperform value, and this in the period ending in 2007, because a shake-up happens at the start of the GFC causing growth to outperform (Arnott et al., 2021). Because there is a need for a global model, since economies differ in performance and economic events around the world, the aim of this research results in examining the place of GARP in the paradigm before 2007. Since 2007, a major shake-up in financial markets led to an expected shake-up in the value and growth performance paradigm. Second, because of that shake-up, it will be assessed whether GARP outperforms both value and growth, from 2007 onwards. The end point will be extended to 2023. Again, construction of a global model will be attempted. With this assessment it is to be attempted to designate a theory that GARP is the best strategy today, better than value, better than growth. And this will have to be proven across markets and over a substantial period of time, in order to generalize the results. That will determine which style will make the most money today. It will be attempted to complete the old paradigm across markets and over time and to set a new paradigm across markets and over time. In the literature, both the fit of GARP in the old paradigm and the entire new paradigm are missing. Therefore, the objectives of this study are:

- To understand and test how GARP performed relative to value and growth across markets during the period up until 2007 and thereby introduce GARP into the old paradigm, where value outperforms growth, thereby completing the old paradigm.

- To understand and test how GARP performed relative to value and growth across markets over the period after 2007 extended all the way to 2023, because of changes that may have occurred to the paradigm, and with this knowledge to attempt to set up a new paradigm.

Hence, the specific research questions are as follows:

RQ1: How does GARP investing fit within the paradigm of value outperforming growth across markets before 2007, and how can that paradigm be defined in its completeness?

RQ2: How does GARP fit within the new paradigm where growth outperformed value across markets since 2007, extended to 2023, and how can that new paradigm be defined by means of that knowledge that is given and is available?

1.5 Significance of the Study

First of all, there is practical significance originating from this study for growth, value and GARP investors. When the new paradigm is delineated and GARP outperforms growth and value, it becomes possible to reject the traditional value and even growth and choose GARP for investment. In that way, investors can specialize in GARP. Since GARP includes both value and growth (Lynch and Rothchild, 1994; Lynch and Rothchild, 2000; Wirawan and Sumirat, 2021), it becomes necessary for value investors to learn growth and for growth investors to learn value. Doing this, with the combination of value and growth, will ensure their returns are maximized. Buffett has been doing this for decades and he performs well (e.g. Greenwald et al., 2004).

Entire fields of investing, such as traditional value, will become obsolete. The entire Fama and French (e.g. 1998; 2021) paradigm that value outperforms growth, will be obsolete. The entire value strand, as already has happened, moves to paying reasonable prices (Greenwald, 2020), in essence, GARP. Then, it will be supported by empirical findings of GARP outperforming value and growth. Even if GARP did not outperform there still would be practical relevance from this study, since it would be clearer which strategy is best for making money and which to learn and practice.

Moreover, other (practical) benefits are that jobs can be created, specifically for GARP-oriented investors. Skills relevant to GARP can be learned. The need for both value and growth to be mastered requires more training than specializing in either value or growth alone. Security analysts would need to have different training, focusing more on growth and forecasting and less on tangible assets as these become less important since traditional assets lose ground and intangibles become more important (Greenwald et al., 2020).

Finally, if a new paradigm in investing style outperformance is introduced, that causes a vast amount of new and different uses of the theory for investors, banks, funds, institutions, analysts' jobs, researchers, and training, compared to the old paradigm which must have entirely different uses.

1.6 DBA thesis structure

The remainder of this thesis is organized, as follows, hereafter. Chapter two will be aimed at the review of the literature. Sub-section 2.1 discusses a (more) general

theoretical framework, succeeded by sub-section 2.2 where a critical literature and more detailed review regarding the place of GARP in the old paradigm will be presented, leading to the actual presentation of the first two hypotheses. Sub-section 2.3 discusses the details of the literature regarding the place of GARP in the new paradigm, followed by a second pair of hypotheses. Sub-section 2.4 presents the research gaps according to the literature. The final sub-section of chapter two, will present a summary of the literature review as it stands today.

Chapter three will be aimed towards presenting the methodology used in this thesis. Sub-section 3.1 will present an overview of the research problem. Section 3.2 presents an operationalization of GARP as a main theoretical construct. Sub-section 3.3 is aimed at repeating the purpose of this study and notes the central metric of B/M and how it is used to further operationalize the constructs of value and growth. Sub-section 3.4 will present the research design of this study in order to test the hypotheses and answer the research question, including a somewhat more general presentation of the procedures taken to answer them and the tools used to analyze the data. Sub-section 3.5 will present an overview of the data, including a description of the data sets used. Sub-section 3.6 will discuss the data collection method used in this study, while sub-section 3.7 describes how the data was prepared for data-analysis. And sub-section 3.8 details the actual data-analysis methods used, nineteen methods were used in total. Sub-section 3.9 addresses limitations to the methodology and sub-section 3.10 concludes on the matters handled in this chapter.

Chapter four will provide the results of this study. Followed by an introduction in sub-section 4.1, descriptive statistics will be analyzed in sub-section 4.2, followed in sub-

section 4.3 by the STL's which is a method utilized to visually compare the similarity between the period before 2007 and beginning in 2007 extending until 2023. The different tests of the difference between both periods is further detailed in sub-section 4.4, while the actual testing of the outperformance hypotheses and related test follow suit in sub-section 4.5. In sub-section 4.6, supporting evidence for the outperformance will be presented. In sub-section 4.7, the implications for answering research question one will be presented while in sub-section 4.8, the implications for research question two will also be detailed. Furthermore, some concluding remarks on answering the research questions will follow in sub-section 4.9. In sub-section 4.10, the buckets are analyzed for reliability purposes. Chapter four will be concluded by a summary of findings in sub-section 4.11 and an overall conclusion of this chapter in sub-section 4.12.

In chapter five, a general discussion of results is conducted in sub-section 5.1, followed by a discussion of research question one in sub-section 5.2, and a discussion of research question two in sub-section 5.3. Chapter six provides a summary of the study in sub-section 6.1, managerial implications in sub-section 6.2, recommendations for further research in sub-section 6.3, and contributions to theory and practice in sub-section 6.4.

CHAPTER II:

REVIEW OF LITERATURE

2.1 Theoretical Framework

The value premium was introduced by Fama and French (2021) as an anomaly, as the value anomaly outperforming the market. Instead of an efficient market which assumes increased risk results in increased returns (Chan and Lakonishok, 2004) and the CAPM that notes that there is linearity between risk and returns (Pätäri and Leivo, 2017), the value premium is explained by overreacting to negative news (De Bondt and Thaler, 1985), investor sentiment (Qadan and Jacob, 2022), fear and herding (Aharon, 2021). Instead of being efficient, markets are inefficient, and only pass through central or "intrinsic" value at times, and shift towards the extreme, either being overoptimistic or over-pessimistic. This is what Graham called Mister Market, as a manic-depressive salesman that tries to sell you your stock, either being irrationally optimistic or irrationally pessimistic, an investor can profit from this manic-depressive behavior (Graham et al., 1988; Greenwald et al., 2004; Graham, 2005). Taking more risk is not a cause of the outperformance of value, because in this reasoning of Graham, the lower the price you pay, the lower the risk (Buffett & Clark, 2006). The margin of safety, which is a margin below the price you pay, a margin of value that exceeds the price at what you pay, is what tackles risk, removes the risk (Graham et al., 1988; Greenwald et al., 2004; Graham, 2005).

Mean reversion is what causes the outperformance of value (Fama and French, 2021). Similarly, excessive optimism on past winners and excessive pessimism on past losers are expected to continue losing (Woo et al., 2020) and past winners tend to lose, and past losers tend to win (Greenwald et al., 2004).

So far three strands have been discussed: value and the EMH. There's also the growth strand which is paying dear instead of cheap. Growth, however underperforms value (Fama and French, 1998). This is because growth stocks are overpriced, and do not revert to intrinsic value (Nissim, 2021).

Value investing focuses on cases (e.g. Greenwald et al., 2020) while Fama and French (e.g. 1998) focus on an entire market, because making theories about entire markets is measured differently than on a case-by-case basis. Therefore, ratios to test entire markets are based on price, with one of those being B/M (Pätäri and Leivo, 2017), and therefore Fama and French (2021) describe value and growth into percentiles, by means of the 70th percentile B/M and growth by means the 30th percentile B/M (Fama and French, 2021).

Value outperforms growth in many markets.. For example, Fama and French (1998), prove the value premium in almost all markets. In addition, many authors generalize the outperformance of value, for example, in Japan, the UK, and France (Das and Rao, 2011), in Hong Kong, Korea, Malaysia, and the Philippines (Drew, 2003).

However, there are a few markets where value did not outperform such as Argentina (e.g. Fama and French, 1998). Hence, value does not outperform in each market at all times.

However, growth is mistaken also by Fama and French (1998; 2021) with glamour. Glamour stocks seem to be companies everyone wants to own (Athanassakos,& Ivey, 2009). Glamour and growth are used interchangeably as growth having high metrics (e.g. P/E) and value as having low metrics (e.g. Ekawati, 2012; Anderson & Zastawniak, 2017; Athanassakos & Ivey, 2009; Pätäri & Leivo, 2010). However, there is more to growth than just glamour (Campbell et al., 2010). Growth stocks need to be cheap as well. Growth investors tend to overpay and these growth stocks often do not live up to their expectations paid for (Ang and Chng, 2013). Hence, Greenwald et al. (2020) give guidelines to not overpay. This approach comes down to GARP, and that is the solution, paying reasonable prices. Fama and French have overlooked GARP as key to the performance of growth and have mistaken growth with glamour. Rappaport and Mauboussin (2003) acknowledge the existence of undervalued growth and undervalued value and attribute that cash flows is valued by the market, with undervalued cash flow, being most important. Hence, again growth can be undervalued and paying a reasonable price fit greatly into this picture. GARP again is crucial for profiting from growth, however, although value outperforming growth has been intensively researched and generalized times over again, the place of GARP in the outperformance paradigm has been entirely ignored. This needs to be researched.

However, starting in 2007 things seem to change. Arnott et al. (2021) notice that from 2007 to 2020, growth investing started outperforming value investing. Lev (2000) describes the main importance of intangibles in today's economy. An adjusted B/M is a better predictor of stock returns than one without adjustment (Park, 2019). However, adding intangibles to the B/M metric over an entire economy is a zero-sum game, since one cannot add 5% or 10% to B/M in an entire economy, as can be done on a case-by-case basis.

21st century companies have high technology, innovative business models instead of the 20th century tangible asset (Park, 2019). Companies need less human and physical capital and less invested capital to build sales (Mauboussin et al., 2017). Greenwald et al. acknowledge the change, stating that today's companies need more intangibles, more operating leverage, and have more incidence of growth stocks (Greenwald et al., 2020).

In many markets growth outperformed value recently. For example, in Sweden and Norway, but not every year (Andersson and Holmgren, 2022), and the DJIA in the US since the GFC (Bevanda et al., 2021). The widest performance record gap between value and growth ever has been recorded, going from 2009 at least to 2020 (Lynch, 2021). Still, there is no overvaluation in sight. In the US the S&P, the Nasdaq and the DJIA all are fairly valued, despite being at a record high (Cingari, 2024). Something material must have changed. Moreover, the value premium has suffered in recent years, being weak for decades (Blitz and Hanauer, 2020). Value had a severe drawdown of almost 40% (Blitz, 2021a). Historically, there were other value drawdowns

and episodes of growth outperforming value, for example the drawdown before the dotcom bubble between June 1998 and February 2000 and the period of 1989-1991. Then, growth stocks outperformed value by a large margin (Blitz, 2021a).

Value investors have historically been refusing to doubt the value investing strategy (e.g. Graham and Dodd, 1934; Greenwald et al., 2004). But now, even famous value investing professor Greenwald seems to switch stance, growth seems to outperform value, therefore a pivot towards growth valuation is needed, which he presents in his work (Greenwald et al., 2020). Things have changed towards more tech. The big tech companies like Amazon, Apple, and Alphabet today are called by some as the big companies that exist today that are the oil and big bank of their days (Birch and Bronson, 2022), or more notably the chemicals, and electricals of their days which where the growth stocks of their days (Fisher and Fisher, 2007). The pace of disruption is faster (Cliffe, 2011). Half of the 1999 list of 15 highest valued market cap tech companies worldwide were replaced by newcomers in 2009 while from 2009 to 2019, only four of the 1999 companies made it through the industry (Crawford et al., 2020). Paradigms are shifted more easily (Sprague, 2010).. Some even find that paradigm shifts in the near future will occur so rapidly that there is an end to competitive advantages, meaning that there will be no paradigms left to exploit (McGrath, 2013). Greenwald et al. (2020) acknowledge the increased disruption and see opportunities. Greenwald and Khan have detailed technological disruptions, the (tech) companies these authors present that disrupted came out to be very profitable (Greenwald and Kahn, 2005a). Hence, the

opportunities are still present and this heightened fear of hypercompetition is only speculation. Graham has always warned against speculation (Graham, 2005).

There is debate, however. Is this outperformance of growth temporary or just part of an unusual macro environment, is value investing dead (Cornell and Damodaran, 2021). Are low-interest rates to blame (Weis et al., 2021 or the popularity of the value approach (Israel et al., 2020). Many explanations could be given. There also is a lot of confusion, Greenwald et al., (2020) note that the last word might not have been said. There also is no uniformity in outperformance across markets. Some report a value premium in some years, while in other years there's a growth premium, as in Italy (Gagliolo and Cardullo, 2020). Many still report a value premium for some periods, such as in the Nifty Fifty (Atodaria et al., 2021). This is lack of uniformity. A global model is needed.

Growth outperforms value according to Arnott et al. (2021) and Greenwald et al., (2020). It has been advocated to beware what you pay for growth with these changes towards more growth (e.g. Greenwald et al., 2020). Hence, as this in essence means buying growth cheap or in other words, paying growth at a reasonable price, GARP again comes in the picture (Lynch and Rothchild, 1994; Lynch and Rothchild, 2000. It is expected, therefore, that GARP will outperform both value and growth. If growth would outperform it would be paying for growth for growth's sake with no economic reality in terms of earnings and quality of the stock (e.g. Graham et al., 2008). Since growth seems to outperform value (Arnott et al., 2021; Greenwald et al., 2020), GARP must outperform growth and value in this new paradigm, across markets.

2.2 GARP and the value outperforming growth paradigm

The efficient market hypothesis (EMH) assumes that increased returns equals increased risk (Chan and Lakonishok, 2004). Within investing, the EMH led to an entire sub-field or strand of theories. The followers of this sub-field are the so-called efficient market proponents (Greenwald et al., 2004; Graham et al., 1988). The Capital Asset Pricing Model (CAPM) is closely related to the EMH and was introduced by Sharpe (1964) and Lintner (1965). The CAPM assumes linearity between risk and return (Pätäri and Leivo, 2017). Some dignify it as an absurd model because of the assumptions it makes and the devastating consequences of wrong decisions that follow from it (Fernandez, 2015). There's more to returns than just risk (Fama & French, 1996a). There are anomalies, that explain returns better than the CAPM. (Fama & French, 1996b). Anomalies are rejections of an asset prices model such as the CAPM (Linnainmaa & Roberts, 2018). The best model to explain returns of anomalies over the CAPM is the five factor model of Fama and French (2015) (Hou et al., 2017). The five factor model consists of market, size, value, profitability, investment anomalies (Fama and French, 2015). Utilizing these factor anomalies for investing is known as factor investing (Blitz, 2023).

The most discussed anomaly factor is the value premium which means that value outperforms the market. (Fama and French, 2021) The value premium arises from overreacting to negative and dramatic news (De Bondt and Thaler, 1985). The value premium correlates with investor sentiment (Qadan and Jacob, 2022) The value premium is also explained by sentiment based news related to a time-varying discount rate for cash flows, related to positive and negative news (Fabozzi and Nazemi, 2023).

Fear and herding are good explanations for the value premium. Herding is strongly related to fear as measured by the fear index or VIX-index (Aharon, 2021). Importantly, changes in the VIX drive variations in returns in the value premium (Durand et al., 2011). The value strand is a widespread stride of theories. This strand of theories stands in great contrast to efficient markets and it seems to have the upper hand. Markets are inefficient, driven by folly, at times they pass through central or "intrinsic" value but mostly they work towards the extreme, either being overoptimistic or over-pessimistic (e.g. Graham et al., 1988; Greenwald et al., 2004; Graham, 2005). This strategy has been called value investing (e.g. Greenwald et al. 2004) and has found widespread support. The value premium is the outperformance of value investing over the market (e.g. Fama and French, 2006).

Default risk seems to lead to explaining the value premium (e.g. Algammal & McMillan, 2014). Many authors attribute the value premium to risk (e.g. Algammal & McMillan, 2014; Fabozzi & Nazemi, 2023). That, however, is not the case because value investors manage risk, they do not simply take more risk (e.g. Greenwald, 2004). They in fact are risk averse (e.g. Greenwald, 2020). Value investors aim for high returns and low risk which can be traced back to the security analysis books of the late Ben Graham (Damodaran, 2012). The lower the price you pay, the lower the risk (Buffett & Clark, 2006). A famous Warren Buffett quote is “risk comes from not knowing what you are doing” Doroghazi, 2022). Taking more risk is a wrong explanation for the value premium.

Moreover, the causes of the value premium are clear. De Bondt and Thaler (1985) note that there is excessive optimism on past winners and excessive pessimism on past losers are expected to continue losing (Woo et al., 2020). Many authors justifiably note observed return reversal (e.g. Woo et al., 2020). Greenwald et al. (2004) note that past winners tend to lose, and past losers tend to win. This opens the door for opportunity (Greenwald et al., 2004). Excess returns can be achieved by mean reversion. Some state reversions vary in speed. During World War Two and the Great Depression mean reversion speed would be the highest, sometimes it could take longer, lasting for many years from 2.1 to 23.8 years, to absorb half of the shocks that needed to be reversed from (Spierdijk et al., 2012). However, in a portfolio of 50 extreme losers and 50 extreme winners, from 1926 to 1982, annually, the extreme losers outperformed by an average of 31.9% on the NYSE (De Bondt and Thaler, 1987). In Singapore, five years after formation growth (value) stocks have high (low) earnings growth and high (low) return on equity in the following years, there is mean reversion for excess ROI but not for excess earnings growth rates. This was during the period between 1975 and 1997 (Yen et al., 2004). However, mean reversion leads to returns higher than the market rate of return as value outperforms the market monthly (Fama and French, 2021). When outperformance is averaged out there clearly is mean-reversion since the mean is the average.

Fama and French (2021) define the value premium as "value portfolio returns over the market portfolio returns". Next to the market, value investing also seems to outperform growth investing and this is the third sub-field and strand of theories, which

in terms of price "level" seems to be the opposite of value investing (e.g. Fama and French, 2021). That is, growth investing or investing in stocks with high prices tends to perform better than the market, while value investing tends to perform better than the market and better than growth because of low prices (e.g. Fama and French, 2021). The reason is that growth is already overpriced, value stocks revert to their intrinsic value, growth stocks do not and therefore underperform value (Nissim, 2021). The success of value investing comes from behavioral biases. Lakonishok et al. (1994) are the first to evidence that value outperforms growth, and note, similar to the value premium, not that value is riskier, but that it is the behavior of investors, in other words, behavioral biases, that matters (Lakonishok et al., 1994).

This has emerged into a field of study where the dealing with the many behavioral biases is studied is long known as behavioral finance (Griffin, 2015). The behavioral biases lead to wrong decisions and behavioral finance attempts to solve them (Griffen, 2015). Dealing with biases causes value investing to outperform (e.g. Greenwald et al., 2004) and most investors in the market have behavioral biases, value investing seeks to exploit those biases (e.g. Greenwald et al., 2004). Contrarianism exploits the same biases and is part of value investing. It involves picking losers because they are undervalued stocks also because there was bad news on the company and the market overreacts to that. It also involves selling winners that have had good news (Chan, 1988). Similarly, contrarianism is seeking stock that are down in price and unpopular and sell stock that are up in price and popular (Hagstrom, 2024).

The value premium and the outperformance of value investing over growth investing have generally been extensively proven by ratio analysis. Not surprisingly, the ratios under review include the term "price". That is, ratios being cheap or ratios being dear (Pätäri and Leivo, 2017). Value is described as the 70th percentile B/M and growth as the and high B/M is a low or cheap "price". Dimson et al. (2003) evidence BE/ME to measure the value premium. A comprehensive literature review assumes the value premium has 5 value anomalies: E/P, B/M, CF/P, S/P, and D/P (Pätäri and Leivo, 2017). These ratios, which are high for value and low for growth cause value investing to outperform growth and together they represent the value premium (Pätäri and Leivo, 2017). Bauman et al. (1998) present the inverse ratios of the Pätäri and Leivo ratios, that is, Bauman et al. (1998) use P/E, P/B, P/CF, and P/D to determine the value premium. Das and Rao (2011), on the other hand, use E/P, B/M, CE/P, and D/P for the value premium (Das and Rao, 2011).

The evidence on the value premium and the corresponding value outperforming growth anomaly (e.g. Pätäri and Leivo, 2017) is based on many of the ratios presented above and manifests itself in many markets and over long periods. For example, the outperformance of value over growth is proven internationally across 28,000 return observations in 21 markets for ten years on a total return and risk-adjusted basis, using P/E, P/B, P/CF, and P/D from 1986-1996 (Bauman et al., 1998). In the UK, the value premium and value investing outperforming growth is proven between 1955 and 2001 for all stocks listed on the London Stock Exchange by using the metric BE/ME (Dimson et al., 2003). With P/E and P/B ratios, the value premium and the interwoven value

outperforming growth, is proven in Canada for the period between 1985 and 2005 (Athanassakos, 2009). In China, the value premium is decomposed and proven together with B/M-related metrics for value outperforming growth, the evidence was gathered between the period 1994 to 2015 (Ho and An, 2020). In Japan, the UK, and France there is a value premium based on B/M, E/P, D/P, and CE/P from 1975 to 2007, there is a strong reliance on value outperforming growth data in their findings and their methodology (Das and Rao, 2011). In Hong Kong, Korea, Malaysia, and the Philippines, there is evidence of the value premium, dismissing the CAPM by, among other criteria, using high and low B/M factors (Drew, 2003). In Bangladesh, utilizing P/E and P/B ratios, there is a value premium and value dominating growth between the period of 2000 to 2004 and the period between 2005 to 2009 (Rasul, 2013). Decisively, Fama and French (1998) present international evidence, a thorough investigation of value outperforming growth across markets, measured by B/M value.

However, value does not seem to outperform growth in every market in all periods. Fama and French (1998)'s study demonstrate Argentina, Colombia, Mexico and Pakistan as countries with a negative value/growth spread in terms of B/M. Fama and French (1998) confirm that emerging markets match developed markets in the value premium. The authors referencing to these facts, Gonenc and Karan (2003) note in their study that from 1993 to 1998, the emerging Istanbul stock exchange, neither value, neither growth outperformed.

Gonenc and Karan (2003) cites Chen and Zhang (1998) who attribute the difference between value and growth outperformance across markets to market growth

(Gonenc and Karan, 2003). This may be correct as some indicate that growth outperforms in bull markets and economic expansions while value outperforms in recessions and bear markets (Cussen, 2023). In practice, it is indeed widely known that growth stocks tend to outperform value stocks in later phases of long bull markets (e.g. Greenwald et al., 2020). Value tends to perform better during bear markets, such as can be seen in the Finnish stock market from 1993 to 2008 (Pätäri & Leivo, 2009).

The causes of value outperforming growth are somewhat controversial. Bourguignon and De Jong (2003) state that as a result of including temporary mispricing in the PE's, the superior showing is caused by the distress of the value stock. These authors study many markets, including the 6 largest ones, from 1991-2001 (Bourguignon and De Jong, 2003). They see value as a short-term style, and growth as a long-term style (Bourguignon and De Jong, 2003). Similarly, Beneda (2003) found that growth, in the long run, outperformed value using long-term PEs up to eighteen years from 1984 to 2001, and what they found was that buy and hold outperformed, in other words, in the long run, growth outperformed value (Beneda, 2003). But this is contradictory, Fama and French (1998) measure value and growth by the same metric B/M regardless of the time frame.

The contradiction is well founded. The short-term distress of the PE of the value stock of Bourguignon and De Jong (2003) caused an even greater value premium, Beneda (2003) demonstrates that growth outperforms PE taken in the long run, hence explaining why growth (growth is long-term PE), differs from value (value is short term caused by temporary mispricing in their PE). When P/E's are isolated, hence empirically tested

annually, value stocks outperform growth stocks in the long run but that is to be expected when high P/E stocks are overpriced! Growth stocks do create some value as this author recommends 30% growth stock in the long run as growth outperforms by times (Wang, 2011).

In any case, Beneda (2003)'s buy-and-hold growth outperformance strategy is consistent with the major themes from influential authors in growth investing as Fisher (1996) who would buy and hold a growth stock over the years, rising PE's over the years and emphasizing paying a conservative price eventually leading to a handsome profit (Fisher, 1996). T. Rowe Price, the father of growth investing, selected shares in the early stages of their growth stage and held on to them throughout the entire growth stage of their lifecycle (Bond, 2019; Price, 2013). That is, instead of holding them for a month or even a year like Fama and French (1998) have tested, these growth investors held shares for a decade or more (e.g. Fisher, 1996) if not forever (Greenwald et al., 2004). Growth stocks are bought most successfully before most of the investment community recognizes the growth before investors bid up the shares, hence at conservative prices (Fisher and Fisher, 2007), hence it would take decades to hold them and to sell them and profit from them. Hence, there is a controversy.

But there is a difference between cases and the market in general. To test whether value outperforms growth in the entire (generalized) universe of stocks, methods like Fama and French (1998) are still best-in-class because Fama and French test the entire market, and also over long periods, longer than the value investing and growth authors can provide cases of for an entire market and longer and more generalized across whole

markets than Beneda (2003) could in his study. Fama and French (1998) and many others have thus proven value outperforms growth across markets for many decades.

But next to the EHM, which is irrelevant for this purpose, and value and growth, there is a fourth, not so well-understood strand, called GARP, which is the mixing of value and growth (Lynch and Rothchild, 1994; Lynch and Rothchild, 2000; Wirawan and Sumirat, 2021). Growth can be bought at a reasonable price because growing stocks do not sell at low prices, but rather high ones depending on the way growth is seen by the investment community as endless or not (Fisher, 1996). Even medium prices will result in higher prices from growth stocks over time when there is much growth ahead because growth is paid at reasonable prices, leading to higher prices for growth stocks when the stock market acknowledges the growth (Fisher, 1996; Lynch and Rothchild, 1994; Lynch and Rothchild, 2000). When stocks are bought with stock prices at a price that includes 20% growth what are you going to do when growth falls to 15% (The Surprising World According to GARP. 2020), when this is taken vice versa growth isn't always expensive, therefore Greenwald et al. (2020) use the growth rate to determine how much to pay for a given growth rate.

Value investors have historically recognized that better growth prospects sell at higher prices than traditional asset value stocks (e.g. Greenwald et al., 2020; Greenwald et al., 2004; Graham et al., 2008; Graham et al., 1988). Greenwald et al. (2004) notice that Warren Buffett, a successful value investor, refers to growth investing as being thought of in opposition to value investing as a mistake. "Growth is always a component of value investing… whose importance can be ranged from negligible to enormous"

(Greenwald et al., 2004, p. 165). High E/P combined with high EPS growth outperforms high E/P alone, EPS growth is a growth measure, high E/P is a value measure. Hence instead of being mutually exclusive value and growth can thus be combined (Ahmed & Nanda, 2000). Growth is actually misunderstood, it is not merely based on low B/M or high P/E like many authors attest, there is a diversity of growth investors, many if not all, favor underpriced growth (Damodaran, 2012).

The misunderstanding is caused by the misconception of growth being identical to glamour. Glamour and growth are used interchangeably, also in the same context as growth is distinguished from value, as growth having high metrics (e.g. P/E) and value having low metrics (e.g. Ekawati, 2012; Anderson & Zastawniak, 2017; Athanassakos & Ivey, 2009; Pätäri & Leivo, 2010). Glamour stocks seem to be companies everyone wants to own (Athanassakos & Ivey, 2009), while value stocks are ugly (Greenwald et al., 2004). Glamour stocks are popular, heavily traded (Chen et al., 2010), value stocks are neglected (Greenwald et al., 2004). Glamour investors are very optimistic, too optimistic (Duong et al., 2014), while value investors are prudent and conservative (Graham, 2005). Glamour investors target companies that had earnings growth the last few years and have high future potential of earnings growth. Glamour stocks underperform the market (Urban, 2020). Prices of glamour stocks tend to go down while prices of value stocks tend to rise (Magnuson, 2011). Similarly, admired stocks tend to have lower returns than despised stocks from 1983- 2006 (Anginer et al., 2007).

Growth stocks are not merely glamour stocks based on sentiment alone. There is more to growth than just glamour (Campbell et al., 2010). Growth stocks need to be

cheap as well. Growth investors tend to overpay for growth projected in the future, when these growth stocks do not live up to their expectations and this is called a growth trap. There is also often a lacking on a sufficient margin of safety, hence it is important to not overpay (Ang and Chng, 2013). Cash flow fundamentals are important for value and growth. Growth stocks are subject to temporary movements in the market discount rate with respect to cash flows, while value's cash flows are based on permanent movements in the cash flows of value stocks. (Campbell et al. 2003). Similarly, a business is worth the present value of its future cash flows (Mauboussin, 2018). Cash flows are crucial for growth or value investors alike. Making cash with cash interest into more cash is the crux of capitalism. Exploiting undervalued cash flows is key (Rappaport and Mauboussin, 2003). Again, undervalued stocks outperform, whether it is undervalued growth or value and the combination of the two is possible as Lynch and Rothchild (2000; 1994) termed it GARP. Rappaport and Mauboussin (2003) clearly agree.

GARP concerns above average growth rates and below average valuations, that is below average prices (P/B or P/E) (Newswire, 2011), Lynch and Rothchild (2000; 1994), invented the term GARP. Lynch was a fund manager with Fidelity Magellan and achieved returns of 29% from 1977-1990 per annum from this GARP strategy (Wirawan and Sumirat, 2021). Buffett earned an 18.7% annual return from 1976 to 2017 (Wirawan and Sumirat, 2021). The method of Buffett in essence comes down to the GARP method utilized by Lynch (Lynch and Rothchild, 1994; Lynch and Rothchild, 2000). In comparison, the Dow Jones Industrial Average returned 11.35 per annum in the period

1961-1998 (Hirschey, 2000). GARP stocks are held longer than value stocks (Harvey, 1998).

Out of the evidence presented, GARP is a fourth strand, it is related to value and growth and it tends to overlap, hence appearing in the middle, buying growth cheap. Both value and growth need to be bought cheap (Ang & Chng, 2013) and both depend on cash flows that must be undervalued in the market (Rappaport and Mauboussin, 2003). Although Fama and French (1998) prove that value outperforms growth and this outperformance is further generalized by others, there is the misconception of growth being glamour that actually comes down to growth investors overpaying, hence GARP investors seem to outperform the market. Moreover, there is enough recognition in the literature that GARP is very profitable and a distinct strand, which merits attention on its own next to value and growth. In other words, this fourth strand GARP in the middle has not been included as a distinct concept in value outperforming growth paradigm that was proven for many decades (e;g. Fama and French, 1998). Moreover, researchers must have mistaken growth with glamour. There is no clear theory, and a clear void or gap, in the literature on the place of these middle stocks of GARP within this paradigm. Hence, although introducing GARP into this paradigm is novel, researchers must have overlooked the matter for decades, the matter was present in the overlapping middle of growth and value, and hence it has been hiding in plain sight for many decades. There is a need for a global model, however, as some markets seem to provide mixed evidence.

Even Fama and French did not think of it. Furthermore, Bauman et al. (1998) use P/E, P/B, P/CF, and P/D to determine the value premium, they rank results into quartiles,

there are also results in the middle quartiles, these seem to have higher returns than growth but lower than value (Bauman et al., 1998). Bourguignon and De Jong (2003) assume the grey area in the middle overlapping value and growth but do not study it. These authors subdivide growth and value into subsets according to the division growth/nongrowth and value/nonvalue (Bourguignon and De Jong, 2003). According to these authors, value and growth combined are inexpensive and strong growth combined (Bourguignon and De Jong, 2003). From 1988 to 2003, in the Eurozone, a value strategy with high earnings growth outperformed both value and growth. Value with low P/E but high earnings growth outperformed both high and low P/E with low earnings growth (Chahine, 2009).

At present, there is one study, by Hodnett and Hsieh (2012) that attempts to shed light on the matter. P/S is utilized for GARP in the Taiwanese market to illustrate that GARP outperforms growth in the Taiwanese market (Hodnett and Hsieh, 2012). However, the focus is on P/S. According to the literature review of the researchers, P/S is a better predictor of the Taiwanese stock market and other reasons. These researchers utilized average or below-average sales-to-price ratios for GARP stocks and utilized high sales growth rates for growth stocks. The conclusion was that GARP outperforms growth for the P/S metric versus the sales growth rates. This was for the period between 2000 and 2010 (Hodnett and Hsieh, 2012).

The study of Hodnett and Hsieh (2012) is based on P/S and sales growth rates, with GARP outperforming growth. Out of the literature follows P/S does not automatically lead to outperformance, there needs to be profitable sales to gain share

price (Fisher, 2007). Furthermore, it is unclear how it relates to value, no linking is made and no reference is made to the inclusion of GARP in the value versus growth paradigm, nor is made use of a comparable ratio to the value versus growth paradigm such as B/M, nor is it generalized across markets.

A second study demonstrates that during the period 1996 to 2010 for all behavioral finance strategies such as growth, value, contrarian, and GARP, at the Finnish stock market, GARP has the best performance based on short holding periods and contrarian and growth strategies the worst. When longer holding period are used, growth and contrarian are the only successful strategies. This author emphasizes fundamentals such as earnings, book value and compares these to price. This author views GARP at no overpriced growth and the importance of the PER ratio. This author views growth investing occurring primarily in times such as the dot.com boom. That is, in the later stages of a boom-period. In terms of absolute returns GARP performs better than growth and value in the short-term. Strategies are tested with 6, 12, 36 months (Kotilainen, 2012). This is a long way from claiming GARP generally outperforms growth or value across markets, hence in general is not shown here, and a long way from outperforming over time across markets.

Additional evidence suggests that GARP strategies outperform the market together with value. This is found by GARP and value strategies based on fundamentals alone such as EBIT to EV outperform the market from 1998-2006 for all US stock in the Compustat research insight database. This author defines GARP as high profitability or

cash flow compared to assets or invested capital (Larkin, 2009). Again, there is no indication of GARP outperforming growth or value across markets, over time.

However, starting in the beginning of 2007, growth starts to outperform value (e.g. Arnott et al., 2021; Greenwald et al., 2020), making the entire paradigm subject to change. However, GARP has not yet been integrated into the old paradigm. A theoretical framework for a possible new paradigm will be presented in the second sub-section of this literature review. Since the new paradigm starts, and the old ends, at the beginning of 2007, the cut-off date between the old paradigm and the new paradigm will be set on the 1st of January 2007. In a later stage, data will have to be collected, and that data is only available starting on the 1st of July 1990. GARP is expected to outperform growth but not value, and this needs to be generally tested across market because of mixed evidence for some markets around the world at different times.

Since growth is not the same as glamour and is mistaken by it (Campbell et al., 2010) and most growth investors buy growth cheap (Fisher, 1996), and since mixing buying cheap with buying growth is labeled as GARP (Lynch and Rothchild, 1994; Lynch and Rothchild, 2000) and GARP investors outperform the market (Wirawan and Sumirat, 2021), it is expected that GARP will outperform growth. However, it is expected that value will still outperform GARP since the outperformance of value over growth has been studied time and again in e.g. quartiles (Bauman et al., 1998) and, where the middle stocks are proven to perform well, almost as good as value (e.g. Bauman et al., 1998) and no researcher has ever come to the idea that these middle stocks are GARP

and have never been linked with GARP. Therefore GARP will outperform growth but not value and therefore the following conforming hypotheses can be presented:

H1: GARP stocks have higher average international monthly returns than growth stocks during the 1st of July 1990 to the 31st of December 2006 period

H2: Value stocks have higher average international monthly returns than GARP stocks during the 1st of July 1990 to the 31st of December 2006 period

For illustrative purposes, the most important authors to outperformance theory for value or growth that were encountered are presented in panel A of Table 2.1. The most important authors discussing the outperformance of GARP are presented in Panel B of that same table.

Panel A	Value versus growth			
Authors	Data	Examined period	Methodology	Main findings
Fama and French (1998)	13 major Markets around the world, in US, Europe, Australia and	1975-1995	B/M, E/P, C/P, D/P	Value outperforms growth in 12 out of 13 markets

	Far East			
Bauman et al. (1998)	21 markets with 28000 return observations	1986-1996	P/E, P/B, P/CF, P/D	Value outperforms growth
Dimson et al. (2003)	All stocks listed on the London Stock Exchange	1955-2001	BE/ME	Value outperforms growth
Athanassakos (2009)	Canada	1985-2005	P/E and P/B	Value outperforms growth
Ho and An (2020)	China: all stocks on Shanghai and Shenzhen A-market	1994-2015	B/M	Value outperforms growth
Das and Rao (2011)	Japan, the UK, and France	1975-2007	B/M, E/P, D/P, and CE/P	Value premium, strong reliance on value outperforming growth
Drew (2003)	Hong Kong, Korea, Malaysia, and the	Only abstract available, no	CAPM, B/M and the variation	Value outperforms

	Philippines	period available	between the two	growth
Rasul (2013)	Bangladesh, Dhaka stock Exchange	2000-2009	P/E and P/B	Value dominates between 2000 and 2009
Gonenc and Karan (2003)	Instanbul Stock Exchange	1993-1998	Time series regression/ B/M and size	Neither value, neither growth outperforms
Panel B	GARP versus value and/or growth or the market			
Hodnett and Hsieh (2012)	Taiwan	2000-2010	P/S metric versus the sales growth rates.	GARP outperforms growth
Larkin (2009)	All US stocks	1998-2006	EBIT and EV	GARP and value outperform the market

Table 2.1: Outperformance theories 1

2.3 GARP outperformance: a new paradigm

Quite recently, financial markets have changed (e.g. Arnott et al., 2021). Arnott et al. (2021) describe that markets have shifted towards more growth. These researchers notice that from 2007 to 2020, growth started outperforming value. This can be explained by first, the technological revolution has produced more growth and tech companies. Second, value has become so popular over the last decades that the popularity undermines value investing, and this causes the arbitraging away of their effect. Third, the importance of intangibles, tech stocks that have more intangibles than traditional value companies. This explains the underperformance of value between 2007 and 2020 (Arnott et al., 2021).

Intangibles have become crucial. Baruch Lev was one of the first to note that wealth and growth in today's economy is driven by intangibles, leading to abnormal profits and dominant competitive advantages (Lev, 2000). Increasing intangibles is deemed so important that it is leading businesses to save (Li, 2015) and that some advocate changing financial reporting to a large extent (Lev, 2018). From 1975-2016 tangible assets have been decreasing and unrecorded and recorded intangibles increasing. In 2016, intangibles are 23 percent of total capital. An adjusted B/M is a better predictor of stock returns than one without adjustment (Park, 2019). The tech stocks of the 21st century with technology, innovative business models and brand names are becoming more important, instead of the 20th century tangible asset (Park, 2019). Companies need less human and physical capital today, less invested capital is needed for building sales because of less human and physical capital that is needed (Mauboussin et al., 2017).

Greenwald et al. acknowledge the change into the economy of more intangibles, more operating leverage and more growth stocks (Greenwald et al., 2020). Some authors points to the lost edge of B/M while including intangibles in B/M would lead to outperformance again like traditional value, hence these authors blame intangibles alone (e.g. Eisfeldt et al., 2020).

Adding intangibles to B/M for a universe of stocks is a zero sum game. If one adds 5% or 10% to every B/M in the universe of stocks, as is the focus of this study, the end result of the calculation will be the same. Hence B/M should still be a reasonably sufficient measure for outperformance.

Some industries that are not traditional like the Chinese blockchain industry don't seem to outperform in terms of B/M (Ji et al., 2020). However, there is a relationship between B/M and degree of operating leverage and between degree of operating leverage and stock returns. B/M is associated with operating leverage (García-Feijóo and Jorgensen, 2010). Stocks with low B/M tend to have high profitability (growth) and stocks with high B/M tend to average low profitability (value) (Fama & French, 2013).

Value firms have high operating leverage (Obreja, 2013). Operating leverage also leads to increased profitability in 9652 Agri food SME's from 2009-2016 (Grau and Reig, 2021). Operating leverage has a positive effect on profitability in China from 1990-2018 (Tao et al., 2022). Operation leverage increases the range of profits through systemic risk, which leads to more profits for stocks (Lee and Park, 2014). Systemic risk, however, is based on beta and related to the CAPM (Mandelker & Rhee, 1984). Lev

argues that increased operating leverage is related to more cost of capital, hence lower share prices and that operating leverage induces systemic risk (Lev, 1974). The key to operating leverage, however, is that operating leverage leads to more profits as the company can make more money through fewer costs, such as fixed costs that do not increase with more sales (e.g. Greenwald et al., 2020). Operating leverage is associated with stock returns, the value premium and profitability (Jansen, 2009).

Hence, higher operating leverage leads to more profitability. Profits are the bottom line of value investing (e.g. Greenwald et al, 2004; 2020). Just like the cause of outperformance of returns of value over growth is mean reversion and the cause of outperformance of returns of value over the market is mean reversion, so does profitability undergo mean-reversion (Fama and French, 2000). Profitability outperforms and this is termed the profitability premium. Similar to the value premium, the profitability premium exists where valuations on the market are inconsistent with their profitability, based on ex-ante expectations errors during high sentiment periods (Lam et al., 2015). Moreover, there is mean-reversion for profitability and stock returns resulting in convergence of B/M from 1963 to 2004 on the NYSE, AMEX and since 1972 the Nasdaq (Fama & French, 2007). From 1963-2007, the most return was for stocks that increased profitability, which are cheap, compared to earnings (Haugen & Baker, 2010). Likewise, there is a strong relationship between growth and subsequent profitability, this increases expected future earnings and thereby firm value (Li & Nissim, 2014). Similarly, profitability and growth drive equity values (Nissim & Penman, 2001). Profitability leads

to increased stock returns in the ASEAN markets during 2010 to 2019 (dan Perbankan, 2021).

Profitability rises with earnings and sales, there is an optimal level of profitability, there is a limit, though, too much profitability will hamper shareholder value creation (Ramezani et al., 2002). Similarly, profitability has an effect on firm value (Markonah et al., 2020). Decisively, Benjamin Graham valued profitability. Graham acknowledges quality, with quality among other things he meant profitability, there is a need for proxies for increased profitability (Novy-Marx, 2013). Graham's followers such as Greenblatt, value profitability, he selects the 20 top stocks of above average profitability at below average prices and outperforms the market (Domingues et al., 2022). He utilizes earnings yield and return on invested capital to outperform. (Greenblatt, 2010). In his book he notes earnings yield and return on capital as the way to simply outperform by taking the top stocks (Greenblatt, 2006).

The underperformance of value and outperformance of growth is a major trend and theme today. In Sweden, growth outperformed the market in 17 out of 21 years from 2001-2021 while value outperformed the market only 9 out of 21 times. In Norway, value outperforms the market 8 years out of 21, while growth outperformed 12 years out of 21. If all of these 21 years where divided into 4 subperiods, growth outperformed value every single time in both markets. This is based on P/E, in contrast to value outperforming growth based on low P/E's for value, growth has actually outperformed value for over two decades (Andersson and Holmgren, 2022). In the DJIA Growth stocks dominate value stocks since 2009 to 2018 after the GFC, due to tech stocks and the low interest

rates. This is in contrast to previous decades: Previous studies have found that value outperforms growth in the preceding decades. This study used P/E, P/B and PEG ratios. Growth outperforms value in 7 out of 10 years (Bevanda et al., 2021). Similarly, the widest performance record gap between value and growth ever has been recorded, going from 2009 at least to 2020 (Lynch, 2021). But still, despite growth outperforming for such a long time, there is no overvaluation in today's markets. In the US, the S&P, the Nasdaq and the DJIA all are fairly valued, despite being at a record high (Cingari, 2024). Something material must have changed in the market.

The expected return differential between value and growth is also called the value spread or the spread in return between value-minus-growth strategies.(Cohen et al., 2003). The value spread is also known as the value anomaly (Zhang, 2005) Hence, the value spread, value outperforming growth, the value anomaly are all synonyms. The valuation spread between growth and value, or return on value minus growth, or simply the value spread, was at an unprecedented rate in 2020, while value was at its cheapest since 1963 (Arnott et al. 2021).

There seems to be no value premium left. The Fama and French value premium has suffered in recent years, being weak for decades, with simultaneously an extreme widening of multiples similar to the late 1990s that led to the dotcom bubble (Blitz and Hanauer, 2020) when there was massive overvaluation in stocks (Greenwald et al., 2004). As has been discussed, however, today's markets present no such overvaluation (Cingari, 2024).

But there are other similar trends as well that confirm that growth outperforms value. During the quant crisis of 2018-2020 where growth outperformed value and quantitative analysts experienced the crisis of a lifetime, being unable to explain why the situation was the way it was, value being completely wrong for the first time, as lengthy as it did, the only way to profit was to buy big tech, large growing stocks, the most expensive ones (Blitz, 2021a). Value had a severe drawdown of almost 40% (Blitz, 2021a). There were other value drawdowns and episodes of outperforming growth in history, most notably the drawdown before the dotcom bubble between June 1998 and February 2000 and the period of 1989-1991. Then, growth stocks outperformed value by a large margin (Blitz, 2021a). There are violent cyclical variations in drawdowns, including reversals in history and the growth rally between 2018 and 2020 was driven by tech (Blitz, 2021b). Other authors point to value through buying low-valued stocks and selling short high-valued stocks that has been losing its edge for the last 10-12 years (Lev and Srivastava, 2019).

But up until recently, value never lost its edge. Up until now, there has not been a single period that value was not been called dead during a crisis, only to arise from its ashes, every single time (e.g. Greenwald et al., 2004; Graham et al., 2008). Persistently believing in the value approach through thick and thin has been the mantra of value investors for almost a century, beginning with Graham in the 1930s (e.g. Graham and Dodd, 1934) into the 21st century with Greenwald et al. (e.g. Greenwald et al., 2004). However, although most famous value investors always refuse to doubt value investing during a crisis (Greenwald et al., 2004), even Greenwald, the famous value investing

professor is in doubt. Quite frankly, Greenwald et al. (2020) describe similar explanations for the situation as Arnott et al. (2021), that is, that growing tech outperforming traditional asset value, more operating leverage, and more intangibles are leading to the heightened importance of growth stocks in today's economy (Greenwald et al., 2020). Again, something material must have changed.

Material changes can also be witnessed with the big tech companies. The big tech companies like Amazon, Apple, and Alphabet today are called by some as the big oil and big bank of their days (Birch and Bronson, 2022), or more notably the chemicals, and electricals of their days which where the growth stocks of their days (Fisher and Fisher, 2007). The pace of disruption is faster. Product life-cycles grow shorter, competition emerges everywhere, business models are passed-by faster by entrants (Cliffe, 2011). Quite frankly, from 1999-2009, half of the 1999 list of 15 highest valued market cap tech companies worldwide were replaced by newcomers, 2009-2019, 40% turned over again, only four of the 1999 companies made it through the industry: Microsoft, Intel, Cisco and Oracle (Crawford et al., 2020). There is the notion of the transient advantage economy where industries are being disrupted faster and faster and the process of strategy should be based on innovation (Leavy, 2013). Paradigm shifts are frequent in technology companies (e.g. Agrawal & Das, 2011; Rodney, 2020; Raiwani, 2013; Tapscott & Caston, 1994; Cantwell & Hayashi, 2019; Rogers, 2000). Obsolescence of products increases with technology advances in society (Mellal, 2020). It becomes harder to keep up with paradigm shifts in technology (Sprague, 2010). Some find that paradigm shifts in the near future will occur so rapidly that there is an end to competitive advantages,

meaning that there will be no paradigms left to exploit (McGrath, 2013). That seems rather disastrous and too distant into the future.

Greenwald et al. (2020) acknowledge the increased disruption and see opportunities. Greenwald and Khan have detailed technological disruptions, the (tech) companies these authors present that disrupted came out to be very profitable (Greenwald and Kahn, 2005a). These authors also note that in these tech companies the profitability comes from the local competitive advantages, in the case of many tech companies: product space (Greenwald and Kahn, 2005a), because all strategy is local (e.g. Greenwald and Kahn, 2005b).

Likewise, Kenneth Fisher sees the big tech companies such as Amazon, Alphabet, and others as growth stocks and states that these tech companies are growing fast and are the big growth stocks of today. He adds that that is much because they have radical innovative market research, product design, and distribution (Fisher and Fisher, 2007). As long as the situation remains, however, it would be foolish to ignore the great opportunities that still exist today and speculate on the not so near future. Although it is possible to forecast, you must judge the developments as they emerge, and it is not always right, the near term economy is sometimes right, but the long term is hard to predict (e.g. Graham et al., 1988). Speculation in investing is undesirable (e.g. Graham, 2005).

However, it must be acknowledged that there are changes in the market. Greenwald et al. (2020) note major changes in the market, he acknowledges disruption,

and notes that there is an heightened emergence of growth stocks today on the market and these are operating leverage and intangible high and have begun to replace the traditional hard asset stocks of the past. Growth becomes crucial in investing (Greenwald et al., 2020).

There is another theme related to what has been discussed above, that there is a debate going on, and this is an important point to consider, in terms of explaining the altered outperformance environment, as to whether the changes in the markets are temporary or part of an unusual macro environment, and whether value is alive, dead, or just struggling (Cornell and Damodaran, 2021). Many blame the low-interest rates since the GFC that have resulted in growth outperforming because of the increase of the present value of growth stocks (Weis et al., 2021). That is a possibility but there are other potential causes as well. Popularity of the simpleness of value, intangibles missing in B/M (Israel et al., 2020) (which for the purpose of this study, can be debunked by the fact that adding 5% of book market across the market is a zero-sum game). Changes in profitability patterns might also be to blame. From 2006 to 2016 in 14 European countries, only 30% of banks have regained the profitability that was lost from the profitability shocks of the GFC. (Bongini et al., 2019). Other causes might be more access to data, digitization of the economy, trading facilities that may have changed the rules of the game (Stagnol et al., 2021). A related reason might be the increased efficiency of the stock market (Yang et al., 2008). Similarly, the market is becoming more efficient because investors know more, investors are more experienced, investors have better technology, this leads to a more developed stock market (Gu, 2004). On the

NYSE, asymmetry of cross-correlations has a decreasing tendency, lead lag relationships in daily returns disappeared over 20 years, the market is becoming more efficient (Tóth & Kertész, 2006).

Not everything is known about the changes in the markets, and how long they will last and there might not be the last word being said about this (Greenwald et al., 2020). There is no easy answer as to why value has underperformed, it could be that factors were inflated pre-2007 and that this led to post-2004 adoption of this inflated factors (Inghelbrecht, 2019). Average profitability and operating efficiency of stocks deemed overvalued by B/M has increased since the GFC while those that were undervalued by B/M have decreased. This might explain the underperformance of value (Agrawal and Nigro, 2020).

Adding to the confusion, there are mixed results regarding the countries and the time period where value or growth outperforms. The Italian market has a value premium between 2001 and 2018, only in the period between 2007 and 2012 growth outperformed (Gagliolo and Cardullo, 2020). So does the Thai stock market from 2005-2019 still have a value premium, this value premium disappears when risk is controlled for (Chancharat & Sinlapates, 2021). From January 2010 to December 2015 in emerging and developed markets, there is a relationship for value and returns, but not in every market (Mosoeu and Kodongo, 2022), while Chiah et al. (2017) find B/M, in other terms value, to outperform in Australia (Mosoeu and Kodongo, 2022) and Lin (2017) demonstrates that emerging markets are mixed about value (Mosoeu & Kodongo, 2022). In the Nifty Fifty between April 2014 and March 2019 value outperforms neutral and growth (Atodaria et

al., 2021). From 2016-2018 on the Indonesian Stock exchange the value factor was found outperforming (Muhammad et al., 2020). From 2002 to 2018, in India, value is redundant, however a composition of value with other factors, in particular profitability, market and size, outperforms (Ali and Mahendra, 2020).

Value funds have outperformed growth funds by more than three times especially in the years leading to 2013, in contrast to earlier years based on the Russel 2000 growth index compared to the Russel 2000 value index based on increased wealth (Pettengill et al., 2014). In the US, value funds underperform growth firms during the pandemic (Pástor and Vorsatz, 2020). Value performed slightly better in Malaysia from 2006 to 2020 (Rohuma, 2023), Value outperformed growth for six countries before and during the GFC, this effect remained in France, Portugal and Japan. The period was 2002 to 2016 for Germany, Switzerland, France, the UK, Portugal, US and Japan. Again the US value did not outperform growth after the GFC (Neves et al., 2021). In Portugal, Italy, Greece, Ireland and Spain, from 2003 to 2015 there is a significant value premium. Value outperformed even in the later years, for P/B, P/CF,P/S but not for P/E (Garcia and Oliveira, 2018).

The US market seems to be the driver of the tech/growth outperformance. The US market has historically outperformed developed markets and emerging markets. Economies follow cyclical performance trends. China has boomed between 2004 and 2007. After the outperformance of 2015 until covid, a heavy outperformance of tech stocks ensued (Dujava and Vojtko, 2024). These are the big growth stocks of today (Fisher and Fisher, 2007). That is why China has welcomed big tech in its economy but

nevertheless started regulating them in order to produce their own big tech stocks (Zhang, 2024). Big tech has almost unchallenged rivalry in their fields due to quasi-monopolistic control (Blank, 2024). These companies are the infrastructural core of the digital economy, the key engine powering future growth, these are the digital monopolies (Klinge et al., 2023).

Because of the difference in the value/growth outperformance theory across markets, there is a need for a global outperformance model. Differences in performance in markets happen daily, not every market undergoes the same ups and downs at all times, nor are all economies alike. Correlations between stock market are increasing, however, between 1988 to 2002 correlations have increased (Yang et al., 2006). This has gone so far that in the last two decades the phenomenon of contagion of one market on the others by e.g. events became a force to be reckoned with. The corona virus, terrorism were all events related to contagion. Quantitative easing is an example of how to reduce this contagion. Spillovers are also happening (Iwanicz-Drozdowska et al., 2021). This all demonstrates markets are getting increasingly undergoing the same effects. This is also consistent with increased market efficiency (e.g. Gu, 2004). This, of course, does not mean markets are identical and as the differences in results for different markets in terms of outperformance demonstrate, markets are far from identical and still contain differences. Clearly, since there are differences between markets, there is a need for a overall global model for a clear view of market changes for outperformance in theory.

The overwhelming evidence however, as has been presented, goes to that something material must have changed in the market. Growth is outperforming value

tremendously for over a decade (e.g. Arnott et al., 2021), it has been doing so in unprecedented ways and still there is no overvaluation in sight (Cingari, 2024) in the leading US market, the leading economy (Dujava & Vojtko, 2024) . As has been discussed, even Greenwald is in doubt. It might not been the last word in this but as long as the situation remains, Greenwald advocates buying growth, but beware of what you pay for growth (Greenwald et al., 2020). This, essentially, brings us back to GARP. Essentially, because growth has the upper hand, it must be of the utmost importance to be able to buy growth stocks at a reasonable price. Therefore it is remarkable that the best value investors have still performed well even after the GFC. The Superinvestors of Graham and Doddsville as they are called are all value investors, many if not all incorporate growth and all outperform from 2009 to 2018 from at least 50% to just under 250% cumulative return, these superinvestors outperform as a paradigm (Soloviova, 2020). So did the superinvestors when traditional value was still outperforming, the superinvestors, even those using traditional value, all outperformed (Buffett, 1984).

Moreover, Fisher was always aware of what he paid for growth stocks (Fisher, 1996). So was Lynch (Lynch and Rothchild, 2000; Lynch and Rothchild, 1994). So is Buffett (Greenwald et al., 2004). And, as has been said, these investors outperformed the market for long periods (e.g. Wirawan and Sumirat, 2021; Hirschey, 2000). Logically, there should be a price on growth, otherwise, you would be buying regardless of value (e.g. Graham and Dodd, 1934). That would lack any underlying economic reality of the stock. This underlying economic reality is a major theme for value investors, throughout

history (e.g. Graham and Dodd, 1934; Graham et al., 2008; Graham, 2005; Greenwald et al., 2004).

Hence, in essence, the question of what outperforms what comes down to buying growth companies at a reasonable price or buying GARP stocks. That must be mission-critical. Hence, GARP must have become more important today than value and growth and it must outperform both value and growth today.

Therefore, it must be expected that GARP performs better than growth and value. Although there is debate about the health of value, the macro environment (Cornell and Damodaran, 2021), about the value drawdown (Blitz, 2021a), interest rates (Weis et al., 2021), explanations such as digitalization of the economy (Stagnol et al., 2021) and that there is increased disruption in today's economy (McGrath, 2013), that there are questions regarding the validity of measures of outperformance because of intangibles (e.g. Eisfeldt et al., 2020). the mixed results regarding different markets and different time periods for outperformance and the causes of outperformance, the fact is that value investing and the stock market as a whole have evolved into an increased incidence of operating leverage high companies, based on growth that are often tech stocks (Greenwald et al., 2020), that is just an evolution of markets (e.g. Birch and Bronson, 2022), into more operating leverage high, growing tech stocks (Greenwald et al., 2020). Of which big tech companies today are the prime examples and these are big oil and big banks of their days (Birch and Bronson, 2022). These high operating leverage companies have more profits as the company can make more money through less (fixed) costs (e.g.

Greenwald, 2020). Operating leverage is associated with stock returns and profitability (Jansen, 2009).

However, these do disrupt more easily (e.g. Greenwald, 2020). As has been illustrated for this operating leverage high, more disruptive circumstances in companies, one still has to be aware of what to pay for that growth (Greenwald et al., 2020). Otherwise, there would be a lack of economic reality (e.g. Graham et al., 2008). Therefore, GARP seems to have become the most important manner for outperformance, because it is important not to overpay for any given company (Greenwald et al., 2020) and it must be that GARP outperforms value and growth more than it did so in the past because growth becomes more important, and a reminder of the previous sub-section is that growth is not just glamour, it is more than glamour (Campbell et al., 2010) you don't pay for growth regardless of the underlying value (e.g. Greenwald et al., 2020) and that the GARP premium over value and growth might have become the main new prospect for outperformance, not the value premium. As long as the situation remains, it must be noted that knowing the performance of GARP stocks relative to value and growth is mission-critical.

There has been a single study on GARP outperformance over value and growth between 2015 and 2019. This study was based on differences between value, GARP and growth. GARP outperforms both on a selection of twenty stocks as found in a descriptive analysis (Priyanto, 2020). From 2008-2018 from the Nifty 100 held throughout this period, low P/E, low PEG and low PERG have outperformed the market, evidence for the

hypotheses that GARP stocks might perform well during this period (Sharma et al., 2024).

Also, GARP outperforms a value portfolio from 2010-2019 in Indonesia. GARP was formed on the PEG-ratio, equity to debt and market capitalization while value was based on P/E, P/B and current ratio (Am, 2020). This author uses differing metrics for value and GARP. It is hardly feasible to draw reliable conclusions of GARP outperforming value out of using differing metrics, following literature (e.g. Fama and French, 2021). Moreover, only the Indonesian market is being studied.

It is paramount to understand whether GARP outperforms growth and value in the new market environment because the importance of GARP has increased and a new paradigm must have been set, away from value outperforming growth, into GARP outperforming value and growth. However, currently, this has not been researched. Different markets seem to have different empirical observations regarding the changing paradigm. Countries undergo different economic experiences, led by the US market (Dujava & Vojtko, 2024). Markets do seem to undergo the same effects (e.g. Iwanicz-Drozdowska et al., 2021). And there is increasing correlation across markets (e.g. Yang et al., 2006). Changes in the paradigm internationally are therefore likely. Because the changes in the market have happened at the beginning of 2007 (e.g. Arnott et al., 2021), and there are some mixed results across geographies and time period, a global, international, long-run model is therefore needed where GARP stocks must now outperform both growth and value. Changes must have come to the old paradigm, growth now outperforms now seem to outperform value (Arnott et al., 2021).

Since Greenwald et al., (2020) assume that traditional hard-asset value stocks have not performed well in the environment of the outperformance of growth companies, and paying a reasonable price for growth companies still is recommended and is also demonstrated in investing cases by Greenwald et al., (2020), GARP is expected to outperform value, therefore this results in hypothesis three below. Since growth has always been around and since the growth companies of today are the big companies of for example the electrical and chemical companies of their days (Fisher and Fisher, 2007), and since growth is not the same as glamour (Campbell et al., 2010), it is still important to not overpay for growth (Greenwald et al., 2020), this comes down to GARP, hence GARP is still expected to outperform growth. This results in hypothesis four below. The following hypotheses can be presented:

H3: GARP stocks have higher average international monthly returns than value stocks during the 1st of January 2007 to the 31st of June 2023 period

H4: GARP stocks have higher average international monthly returns than growth stocks internationally during the 1st of January 2007 to the 31st of June 2023 period

For clarity, besides Arnott et al. (2021) and Greenwald et al. (2020) who present more general evidence on the outperformance of growth over value and other authors who present additional evidence, all authors named in this sub-section that either had findings of growth outperforming or value outperforming are presented in panel A of table 2.2 below, together with their data, the examined period, methodology and main findings. Next to value or growth outperforming, the limited attempts for relating GARP to value

and growth in terms of outperformance as they exist as of today in literature, are shown in panel B of table 2.2.

Panel A	Value versus growth			
Authors	Data	Examined period	Methodology	Main findings
Andersson and Holmgren, (2022)	Norway and Sweden	2001-2021	Outperformance over the market	Growth outperformed the bulk of the time
Bevanda et al., (2021)	US Dow Jones Industrial average	2009-2018	P/E, P/B and PEG	Growth stocks dominate
Gagliolo and Cardullo (2020)	FTSE Italia All-Share index	2000-2018	P/B	Mixed outperformance in value versus growth performance episodes
Chancharat and Sinlapates (2021)	Thailand stock exchange	2005-2019	Long in value short in growth	Value outperforms growth

Mosoeu and Kodongo (2022)	Selected emerging and developed markets	2010-2015	Five factor model	Mixed
Atodaria et al., (2021)	Nifty Fifty	2014- 2019	Three-factor model	Value outperforms neutral and growth
Muhammad et al. (2020)	Indonesian Stock exchange	2016-2018	Three factor model	Value outperformed
Rohuma (2023)	Bursa Malaysia	2006-2020	Differences in mean, sample paired t-tests	Value outperformed
Neves et al. (2021)	Germany, Switzerland, France, the UK, Portugal, US and Japan.	2002-2016	Regression	All markets value outperformed besides the US again where growth outperformed

Garcia and Oliveira (2018).	Portugal, Italy, Greece, Ireland and Spain,	2003-2015	P/B, P/CF,P/S but not for P/E	Significant value premium even in the later years
Panel B	GARP versus value and/or growth or the market			
Priyanto (2020)	Twenty stocks Indonesian Stock Exchange	2015-2019	P/B, P/E and PEG by means of ANOVA	GARP outperforms value and growth
Sharma et al. (2024)	Nifty 100	2008-2018	P/E, PEG and PERG	GARP outperforms the market
Am (2020)	Indonesia	2010-2019	Portfolio of GARP based on PEG, equity to debt and market cap while value was based on P/E, P/B and current ratio	GARP outperforms value portfolio

Table 2.2: Outperformance theories 2

2.4 Literature gaps

Although it has been made clear in literature that value outperforms growth (Fama and French, 1998) and although that this has been enormously widely researched, and although that GARP is profitable for many investors such as Lynch and Buffett (Lynch and Rothchild, 1994; Lynch and Rothchild, 2000; Wirawan and Sumirat, 2021), and although it involves mixing growth is with value is also called a form of value investing by Greenwald et al. (2004), and although middle stocks, quartiles (e.g. Bauman et al., 1998) are researched that seem to confirm GARP outperforming growth, it has not been researched whether GARP outperforms growth or how GARP performs relative to value. This presents itself as a gap that has been hiding in plain sight for decades. Nonetheless, it would complete and further improve the paradigm set forward by Fama and French (1998) that has been intensively researched to this day.

Since the beginning of 2007 when the GFC struck, things seem to have changed, growth seems to have outperformed value at least until 2020 (Arnott et al., 2021). Many brilliant value investors, including Greenwald et al. (2020) seem to have switched stance, indicating that the economy is shifting toward more tech growth companies, that growth becomes more important and that traditional asset-value investors have not performed well in this environment. Hence growth must not be overpaid for according to Greenwald et al. (2020). Out of literature it can be found that something significant must have changed. Since growth outperforms value and most growth investors such as Fisher

(1996) have always been aware of paying reasonable prices, GARP should perform even better than before the GFC struck. These authors and an entire literature review indicate that this would result in GARP overperforming value and growth and a new paradigm has been set. This would mean that a paradigm has changed. However, this has not been researched and therefore presents a void or, better termed, a gap, in literature, that must be researched. Moreover, there is mixed evidence on growth outperforming value around the world, hence a global model is also needed and therefore this adds weight to the gap.

2.5 Summary

The EMH and its efficient market proponents are found wrong (Greenwald et al., 2004). So is the CAPM, because there are anomalies (Fama & French, 1996b). The main anomaly is the value premium. Value outperforms the market (Fama and French, 2021). This can be explained by overreactions to negative and dramatic news (De Bondt and Thaler, 1985), fear and herding (Aharon, 2021). The value strand believes, most notably mentioned Greenwald (2004; 2020), that there is excessive optimism on past winners and excessive pessimism on past losers (e.g. Woo et al., 2020) and that there is return reversal (e.g. Woo et al., 2020). There is mean-reversion leading to outperformance (De Bondt and Thaler, 1987; Fama and French, 2021). Value investing also outperforms growth (e.g. Fama and French, 2021). Growth is based on high prices while value is based on low prices (e.g. Fama and French, 2021). Value outperforms because growth is already overpriced (Nissim, 2021).

Behavioral biases explain the outperformance of value over growth (Lakonishok et al., 1994). Behavioral finance deals with biases (Griffin, 2015) and value investors exploit biases to profit (e.g. Greenwald, 2004). The value premium and value outperforming growth have been extensively proven by means of ratios (e.g. Pätäri and

Leivo, 2017). Value is described as the 70th percentile B/M and growth as the 30th percentile B/M (Fama and French, 2021).

However, value does not outperform growth in all markets at all times. In some circumstances value also outperforms while in others growth outperforms. Value outperforms better in bear markets (Pätäri & Leivo, 2009), while growth outperforms in later stages of long bull markets (Greenwald et al., 2020). Regarding the time horizon on which value or growth outperforms, there is some controversy. Long-term growth P/E outperforms (Beneda, 2003) while short-term value outperforms (e.g. Fama and French, 1998). The reason is that in the short-term (annual) growth is already overpriced, since growth is already overpriced (Nissim, 2021), while in the Beneda (2003) it takes longer to outperform!

The market in general is short-term B/M, like Fama and French (1998) have used short-term B/M, because this in essence tests the universe of stocks, instead of cases that differ in outperformance (Greenwald, 2004; 2020). For the entire universe of stocks it is more feasible to deduct outperformance out of B/M, across the market.

There is also a third strand, GARP, which is the mixing of growth and value. (Lynch and Rothchild, 1994; Lynch and Rothchild, 2000; Wirawan and Sumirat, 2021). GARP hence seems to mix value and growth, however this is not clear. Growth is often a component of value (e.g. Greenwald, 2004). The bad performance of growth compared to value can be attributed to the confusion that growth is the same as glamour. There is more to growth than glamour (Campbell et al, 2010). Growth being attractive (Athanassakos,& Ivey, 2009), while value being ugly (Greenwald et al., 2004). Any business is worth the present value of its future cash flows (Mauboussin, 2018). Hence, growth is misunderstood. Cash flows are crucial for growth or value investors alike (Rappaport and Mauboussin, 2003).

GARP investors, such as Buffett and Lynch, outperform the market (Wirawan and Sumirat, 2021). However, researchers have largely ignored GARP in the paradigm of value outperforming growth paradigm, even though it was hiding in plain sight, probably by the misconception of Fama and French, mistaking growth with glamour. Although there were many indications of the middle stocks to outperform and some have attempted to study GARP on a limited scale (Kotilainen, 2012; Larkin, 2009), there is a clear void in theory on global basis regarding the performance of GARP relative to value and growth. After 2007, growth starts to outperform (e.g. Arnott et al., 2021; Greenwald et al., 2020), therefore, in sub-section 2.2, the hypotheses to test in order to complete the old paradigm, were presented there as they were in sub-section 2.2, for the period ending in 2007.

From 2007 to 2020, growth outperforms value, as a reason given among others, through intangibles (Arnott et al., 2021). Intangibles have become crucial in business (Lev, 2000). The tech stocks of the 21st century replace the 20th century tangible asset (Park, 2019). Greenwald et al. note that next to intangibles, more operating leverage and more growth stocks are the case today (Greenwald et al., 2020). Adding intangibles to a universe of stocks is a zero-sum game, hence this cannot be applied to this research. Operating leverage leads to more profitability (e.g. Greenwald et al., 2020). Profits undergo mean-reversion (Fama and French, 2000) and this affects firm value (Li & Nissim, 2014). This is proven by many authors (e.g. Greenblatt, 2010) so it is a fact that growth outperforming value is a major trend and theme today. Despite growth outperforming for such a long time, there is no overvaluation in today's (United States) markets (Cingari, 2024). Growth has been outperforming value for two decades (Andersson and Holmgren, 2022). The value spread has been at its highest ever, while value was at its cheapest since 1963 (Arnott et al., 2021). Something material must have

changed. The Quant crisis and the large and long value drawdown (Arnott et al., 2021) seem to acknowledge that as well.

The mantra of value investors has been to keep believing it will prevail (e.g. Greenwald et al., 2004; Graham et al., 2008), but now even Greenwald is in doubt (e.g. Greenwald et al. 2020). Growing tech outperforming traditional asset value, more operating leverage, and more intangibles are crucial in today's growth economy (Greenwald et al., 2020). Material changes can also be witnessed with the big tech companies. These are the big oil and big bank companies of today (Birch and Bronson, 2022). Quicker and quicker disruptions are happen leading some to suggest that there will be no paradigms left to exploit (McGrath, 2013). That is too disastrous and meant for a too distant future, Greenwald et al. (2020) demonstrate the opportunities in these companies, it would be foolish to ignore them, Fisher and Fisher (2007) note that the current companies like Amazon or Alphabet are the big growth stocks of today, while judging the economic success of the too distant future is hard (Graham et al., 1988) and Graham (2005) has always warned not to speculate.

There is a debate going on whether this is just an unusual macro environment or that the changes are permanent (Cornell and Damodaran, 2021). Many possible causes for the outperformance are given, such as the low interest rates (Weis et al., 2021). Not everything is known about the changes, how long they will last, and it might not be the last word being (Greenwald et al., 2020). There is no easy answer. Adding to the chaos, there are some mixed results regarding the countries and time periods where growth or value outperforms.

The US market seems to be the driver of the tech/growth outperformance (Dujava and Vojtko, 2024). China has welcomed big tech in its economy but nevertheless started regulating them in order to produce their own big tech stocks (Zhang, 2024). There is a

need for a global outperformance model. The overwhelming evidence is that growth outperforms value. Greenwald et al. acknowledge this, however, Greenwald still warns not to overpay for growth (Greenwald et al., 2020). This brings us back to GARP. GARP must now outperform value and growth. There have been researches on some aspects of this relationship, but by far there is a definite model of GARP outperforming growth and value or any other attempts have been made to bring about the new paradigm and GARP's place in it. This has been hypothesized in sub-section 2.3.

In sub-section 2.4, it has been argued that the hypothetical outperformance of GARP over growth and the place of GARP in the paradigm where value outperforms growth that seems to have lasted for decades, according to literature, is a gap. This must have lasted until the GFC started in 2007, when things seem to have changed (Arnott et al., 2021)..

A second gap in literature has been found. Quite recently, remarkable things have changed in the market (Greenwald et al., 2020; Arnott et al., 2021, does GARP outperform both value and growth for that period?

CHAPTER III:

METHODOLOGY

3.1 Overview of the Research Problem

Knowing whether GARP outperforms growth and value, or how GARP fits in the paradigm of value outperforming growth, is an important problem. Finding an answer to it would lead to numerous benefits for fund managers, individual investors, researchers and others, including better returns. The fitting of GARP within the old and the new paradigm has not been research. GARP's place in the old paradigm, where value outperforms growth, in a global model, is unclear. GARP is expected to outperform growth but not value. In the new paradigm, with growth outperforming value, the performance of GARP is again absent. GARP is expected to outperform both value and growth in this new paradigm.

3.2 Operationalization of Theoretical Constructs

For the purpose of testing the outperformance and thereby the completion of the old and the construction of the new paradigm, the performance of GARP, value and growth need to be measured. The performance of GARP, value and growth can be measured by the B/M metric as growth and value are measured for outperformance by B/M (e.g. Fama and French, 1998). As has been stated in the literature section, B/M still is relevant for measuring GARP, value and growth, even after 2007. Also, when ranked on B/M there is a reversion of earnings growth after being ranked on B/M (Fama and French, 1995). With GARP, this will be no different than with value. Hence, this ex-post performance is key to developing outperformance theory. Since B/M is the most central ratio in this

paradigm, set by Fama and French, and since they utilize the 30th percentile B/M as growth and 70th percentile as named value (Fama and French, 2021), and GARP is based on reasonable prices, neither low, rather medium (Lynch and Rothchild, 1994; Lynch and Rothchild, 2000; Wirawan and Sumirat, 2021), it would be logical to delineate GARP as the 50th to the 70th percentile B/M. This measure would allow for the best possible return originating from the growth of GARP stocks as the lower the price paid, the better (e.g. Graham, 2005), hence higher prices would not obviously lead to higher returns.

3.3 Research Purpose and Questions

The purpose of this study is to relate GARP returns to value and growth returns to complete the old paradigm and construct the new paradigm. Changes in outperformance started in 2007. Growth then started to outperform value instead of the old value outperforming growth. It was at the time of the start of the Great Financial Crisis (Arnott et al. 2021). To test the outperformance of the old paradigm, B/M will be used as outperformance metric. The operationalizion, designating growth as the 30^{th} percentile B/M, GARP as the 50^{th} to the 70^{th} percentile B/M and value as the 70^{th} to the 100^{th} percentile B/M, has been made above. Furthermore, the starting of the period is the 1^{st} of July 1990, since data will only be available beginning then (French, 2024), the end date of the second paradigm will be the 31^{st} July 2023 to keep both periods equal to test both paradigms adequately. This is because of the cut-off date. At about the time of the Great Financial Crisis, 31^{st} of December 2006 is when growth started outperforming value, which therefore is the cut-off date. Monthly data are taken following from Fama and French (1998) which represents the old paradigm. It was expected that GARP outperforms growth in the first period but not value.

3.4 Research Design

In order to test the hypotheses and answer the research questions, a quantitative research design is needed. The entire design relies on quantitative data because in terms of data collection, largely numerical data was collected consisting of numerical returns data. Likewise, the entire data analysis is based on statistical tests and procedures. Hence, the research design is quantitative in nature. For data-analysis, data analytics software R, QI Macros for Excel, XLSTAT for excel are used as well as SPSS software and R-essentials added to SPSS.

The data was collected from the Kenneth French data library (French, 2024)[1]. This data consists of three sets of spreadsheets for developed markets, containing monthly returns differing B/M buckets from low B/M to high B/M. The data was collected and sorted according to value, GARP and growth buckets. For example, the first data set uses the first bucket, the 30^{th} percentile as growth, the neutral bucket or the 30^{th} to the 70^{th} bucket is considered as GARP and the last bucket, the 70^{th} to the 100^{th}, as value. The other two data sets have similar, but slightly different percentiles for growth, GARP and value, respectively. The emerging markets segment must be researched as well as these are a significant part of the global economy, these need a separate treatment for later testing. The data collection is thereby complete.

However, second, the data still needs to be prepared for further analysis. Small size was added to large size where appropriate. Therefore, the small size buckets need to be added to large size buckets and this for growth, GARP and value, respectively, and similarly buckets of B/M divided over buckets of operating profitability and size had to be appointed and totaled to the right B/M bucket of growth, GARP and value,

[1] https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

respectively, because the data is not uniform on B/M buckets and the data was split between these buckets.

With the data ready to use, data analysis is then executed. The first eight steps and the tenth to the nineteenth step were intended to increase reliability, as will become clear. The nineth step will actually test the hypotheses. Next to the nineth step, the entire data analysis procedures as part of the research design assure that testing of the hypothesis is more reliable.

Following the descriptive statistics, as a first procedure, since there are two periods to compare for answering the two research questions, it must be clear that the two periods differ enough. Smoothing of the data is important, to clearly illustrate the contrast between the two periods. Therefore, since also cyclical patterns occur, smoothing cyclical patterns is important, and is done by a seasonal decomposition of time series (STL). STL's clearly does that and therefore is valid, this will lead to illustrating differences between the two periods, because if the periods differ enough in terms of growth, GARP and value, respectively, this will illustrate the outperformance and this might lead to visually observing actual changes in the market and the paradigm. Therefore, this procedure will lead to more reliability of the study, since the research relies on the difference of the two periods, from the old paradigm toward the new paradigm. This will clearly be illustrated by this test.

The data of the emerging markets cannot simply be added to the developed markets data, since there is more data on the developed markets than on the emerging markets. Developed markets are also more important in terms of GDP than the emerging markets.

Even more importantly, the differing percentiles for the growth, value and GARP buckets across the three data sets need to be correlated, otherwise there will be no reliable

conclusions. It needs to be clear what place growth, GARP and value have in the old and new paradigm. But still, emerging markets cannot be ignored for constructing a global model. It is an important part of the research. Therefore the process of STL's needs to be repeated for emerging markets. This has to be done, in order to have a clear theory on the global paradigm. As has been reported in the literature section, the US market leads the way (Zhang, 2024), hence reaffirming evidence should emerge for the completing of the old and the building of the new paradigm. This fourth set will be an important affirmation of the paradigm if it leads into the same direction. Emerging markets cannot be leading, however, since these economies, rely more on low-cost production in their economies instead of the more developed services economies (Greenwald and Kahn, 2008; Stiglitz, 2017), or tech-based economies such as the US which emerging powers such as China trail (Zhang, 2024).

The GARP, growth and value groups also need to differ enough from one period to the next, therefore paired t-tests will be performed between the first period and second period variables to make sure both periods differ, this will make the method more valid because it measures clearly that results differ, more proof is being given, the above point of visual difference is supported and proven, providing the basis for the test of outperformance, which is crucial, because it tests whether GARP, value and growth outperform or underperform, across the two periods and the ensuing paradigms, thereby increasing reliability of the entire set of procedures. The emerging markets set will again be utilized in order to deliver confirmatory evidence by executing separate paired t-tests for the emerging markets. Test to the contrary, will be delivered by testing whether the data of both periods are equivalent and hence are not very different will be executed via a paired data equivalence test (TOST). This will lead to important and more strong evidence. Measuring variances between both period and both markets, for all variables,

will be done by an F-test, in order to discover whether the periods vary. Covariance will be checked for all variables for both periods and markets by means of Excel. And cointegration of the two time series for each variable will be executed by a Phillips-Oullaris cointegration test by adding R-essentials to SPSS. Finally, a correlation test will be executed for the matter of completely determining whether the two periods differ. This will be done via SPSS.

The most important step to be taken, for this research design to be valid and the research to be reliable, is the testing of the hypotheses. When one mean of a hypothesis is significantly higher than the other, the former group outperforms the latter. Fama and French (1998) rely on the mean in a table alone. For improving the test results of Fama and French (1998) resulting from their design, paired t-tests are to be utilized for growth, GARP and value. The median returns will also be tested. For this, XLSTAT will be used. Then, the hypotheses can be answered. This will provide the basis for answering the research questions. This measure clearly outperforms since the mean will be higher for the outperforming stocks, with a sufficient significance level in the results present. For the fourth data set, separate confirmatory paired t-tests will be used for comparing variables in the emerging markets, thereby testing growth, GARP and value's relative performance for emerging markets. For reliability purposes, a number of tests to test the variability of the data around the means are executed. These are a variance test, a covariance test, a correlation test, a test for outliers, a test of the distribution of the data which includes a Shapiro-Wilk test and Kolmogorov-Smirnov test and also a test of skewness and kurtosis which belong to a test of the distribution.

The next procedure in terms of assuring reliability is finding out whether the returns of the different percentiles used for constructing GARP, value and growth, respectively, are highly correlated across the two periods. Therefore, a correlation

analysis is needed. This is needed since, for example, GARP, uses slightly different percentiles in each of the three data sets of the developed markets. A high correlation will indicate that the research is fairly reliable, although a limitation is that this cannot be stated at 100 percent accuracy, but rather 80 percent or 90 percent accuracy. This measure is valid because it illustrates that the GARP, value and growth groups that consist of different percentiles correlate highly and therefore confirm one another in terms of similarity between the three data sets, and this for GARP, value and growth, respectively, across periods. When the correlation is high, this proves that results on what style outperforms what style is actually reliable. It can be argued that correlation of the emerging markets must be skipped in this exercise as it has no reference point of differing percentiles across data set of emerging markets and consists only of the 30^{th}, the neutral and the 70^{th} to the 100^{th} percentile. This cannot be amplified. However, the growth and the value bucket are accurate. Moreover, Fama and French (1998) use these buckets for showing that in terms of B/M value outperforms growth. Most importantly, the emerging market data cannot be used to verify correlations between the buckets of the developed markets outperformance, because it would spoil the exercise, since it is attempted to test the correlations of the buckets of the three developed markets sets, which it intends to measure, hence this is the most valid approach. A test of variance (F-test), a covariance test, a cointegration test will further test the detail and evidence the similarity of the buckets of the developed markets.

After all these procedures, the hypotheses are tested and confirmed or rejected, the research questions answered and it became possible to reliably complete the old paradigm and construct the new paradigm in an international or global manner.

3.5 Data

For the purpose of testing the hypotheses and thereby answering the research question, which in turn will possibly lead to the demarcation of the old and the new paradigm, the first step is the description of the data from the Kenneth French Library (French, 2024), which consists of global data unparalleled in other free databases. The database consists of B/M based returns, going back in time to 1990 and ending in the present. Many, or as good as all developed countries around the world are present. Emerging markets are present, although less detailed. Only one set is available on emerging markets that is utilizable. The other available sets on emerging markets use only two B/M buckets, where growth, GARP and value buckets cannot be separated. The only missing countries are the poorest developing nations such as in Africa. It would be very hard finding reliable data on these countries. Furthermore, for the purpose of research, finding B/M based returns on many poor nations is even more difficult, if not impossible. The overwhelming bulk of the world economy as given here with this data will suffice to achieve a global model of outperformance. The four sets consist of portfolios.

The first set consists of six subsets consisting of portfolios from developed, developed ex-US, European, Japanese, Asia-Pacific ex-Japan, and North American markets. The developed markets portfolio consists of a large number of differing countries such as Australia, Belgium, Austria, Switzerland, Canada, the US, Spain, Finland, France, Netherlands, Italy, Japan, Ireland, Norway, New Zealand, Sweden, Singapore, Hong Kong, UK, Greece, Germany. (French, 2024).

The second set consists of six subsets consisting of portfolios from developed, developed ex-US, European, Japanese, Asia Pacific ex-Japan, and North American markets. The markets in the developed markets portfolio are practically the same as the portfolios of the first subsets. The other portfolios are practically the same in each subset as well.

The third set consists of twelve subsets consisting of portfolios from the same similar markets, three of each of the same six market portfolios as above.

The fourth set, however, deals with one subset of six emerging markets portfolios. The markets are "Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Saudi Arabia, South Africa, South Korea, Taiwan, Thailand, Turkey, United Arab Emirates" (French, 2024). Greece is included in the developed markets as well, hence this is double counting, however, it only forms a small part of the widely diversified portfolios of both the developed and the emerging markets. It cannot be altered in the file, it however counts for developed and emerging and, in other words, the impact level out between the data sets, it must be accepted as having little influence and the unduly difference must be ignored.

The returns of the four sets and sub-sets are in US dollars, not compounded, and are based on dividends and capital gains. The returns of all sets are value-weighted. All B/M buckets of the same percentiles in the same subset or spreadsheet will be added to one another.

In the first data set, there are two times three buckets consisting of two times size (small and large) and three B/M buckets, consisting of the 30th percentile, the neutral bucket, and the 70th percentile bucket. Because there are two size dimensions and three B/M dimensions, this data set is also referred to as two times three.

In the second data set, on the other hand, there are five buckets for size and five buckets for B/M. Therefore, there are five buckets of B/M at the 20th, 40th, 60th, 80th and 100th percentile (French, 2024).

In the third data set, on the other hand, there are two buckets for size, four for B/M and four for operating profitability Therefore, this data set is referred to as two times four times four. There are four buckets of B/M, at the 25th, 50th, 75th, and 100th percentiles (French, 2024).

In the fourth set, there is only one subset, here there are two buckets for size and three for B/M. This data set is termed two times three, and has three buckets, the 30^{th} percentile or growth, the neutral or GARP and the 70^{th} to the 100^{th} labeled value (French, 2024).

The time frame of the data has a starting date on the 1st of July 1990 and an ending date on the 31st of June 2023. This is the identical period required to test the four hypotheses of this research, and this period is divided into two periods by means of the cut-off dates of 31st of December 2006, and 1st of January 2007, the former being the end date of the first period and required to test the first two hypotheses, the latter the beginning of the second that will be used to test the second two hypotheses.

3.6 Data collection method

Indicators in the five factor model include size, value, operating profitability, investment and momentum (French, 2024). Value is the indicator this research is interested in, since it measures return from low to high B/M buckets. There are monthly returns data available in the Kenneth French Library, including data on the three-factor model, the five-factor model, data including momentum, country portfolios for metrics including E/P, but most importantly also B/M. These are very useful data sets, however, the choices made by this researcher, include more broad, detailed, and data spread over three data sets of many subsets of portfolio for the developed markets. Calculations will have to be made to place all the right data into the right buckets and care had to be taken to do this in a careful manner, not to mix up the right data with the wrong data, but this evidence will lead to more generalizable global evidence than any of the other less detailed data sets. The first three data sets were also needed to spread the evidence of the GARP, while the fourth data set will provide confirmatory or if deviating, to the contrary, at least additional evidence, but that it includes important information on the global (old and new) paradigm. It completes the global data collection method. Care again will have to be given for mixing up the small and large data of the three buckets of B/M, not to place the wrong data in the wrong bucket of B/M.

3.7 Data preparation

After collecting the data, the data needs to be prepared before it can be analyzed. In the end, this will lead to the testing of the hypotheses and the answering of the research questions. There are various buckets in each spreadsheet. In the first spreadsheet of the

first set of spreadsheets, there are three buckets of B/M percentiles: low, neutral, and high. There are two classes of companies for each of the three buckets of B/M percentiles: small and large size. The buckets of low B/M percentiles in small companies are added to low B/M percentiles in small companies, for the period before and since the 1st of January 2007. That is the cutoff date, when the market has changed, and the new paradigm probably has emerged and the old has ceased to exist.

The same is done for neutral and high B/M percentile buckets. This process is repeated for the second, third and fourth sets of each spreadsheet, whilst taking into account that the spreadsheet data differs from the size and B/M input, from the Kenneth French Library, for the second and third sets. For example, compared to the first set, the second set has five buckets of size to calculate from instead of just small and large. The spreadsheet data related to the same B/M percentiles are then added and averaged per period. This results in an average return for each bucket of B/M percentiles in each set for each period.

Then, the value, GARP, and growth buckets need to be selected. The buckets are slightly different in percentiles than were operationalized. In the first set, growth will be the low B/M bucket, GARP the neutral B/M bucket and value the high B/M bucket. In the second data set, growth will be the first bucket. GARP would be the third bucket. The fourth bucket would be too high to deserve GARP status as growth typically has low and GARP hypothetically must have high-medium B/M to medium B/M. Lynch and Rothchild (1994; 2000) recommend paying reasonable prices, in other words, neither high, nor low, but reasonable. Value would be the fifth bucket. In the third data set, the

case is clear, the first bucket is growth, the third bucket is GARP and the fourth bucket is value.

3.8 Data analysis

To assess the two periods in terms of data analysis, there is a clear need for visual evidence. Descriptive statistics are visual and will, of course, be utilized to illustrate and demonstrate the similarity of the data. This is important, since there are different percentiles used for growth, GARP and value, respectively. Also the second period would be substantially different, this also would emerge from comparing the data across the two periods.

This will follow from the descriptive statistics. Furthermore, the periods are sixteen and a half years in duration. The average length of a business cycle is 42 quarters in the US, and 49 quarters in the UK (Everts, 2006). More recent authors, however, define the length of the business cycle to be 5 to 8 years on post-war data (Klein, 2023). Some state a period between one to eight years (Ventura et al., 2024). Still other use five to seven years (Forero and Tena-Junguito, 2024). There are many more theories on the business cycle which, at this stage, will be ignored, but the authors named are reasonable sources for determining the length of the business cycle. This is evidenced by the fact that the three sources named strongly triangulate.

With the last economic cycle lasting at least sixteen years, one period of sixteen years and a half may be entirely different from the other period, in terms of cyclicality. The emphasis of this research is on the first period differing from the second period for

GARP, value, and growth, respectively. Since there is debate on the nature of the changes being just extraordinary or permanent (Cornell and Damodaran, 2021). The trend of the cycle of the second period must substantially be higher. Since the trend of the second period must differ, it is essential to decompose the data allowing smoothing for seasonal or "cyclical" patterns. Making this "decomposed" trend will illustrate performance differences between growth, value and GARP in both periods. Hence, for these purposes, seasonal decomposition of time series (STL's) will be utilized. This will be achieved by the statistics and data analysis software R for the developed markets. And separate STL's will be used for the emerging markets data for the same purposes for both periods, as well.

Paired t-tests will be performed in the software package SPSS, because it is important to know whether both periods differ. This follows from the fact that this study's objectives and research questions are based on constructing the new paradigm and completing the old paradigm. That change is coming from the difference of GARP, value, and growth returns, from the first period, which is a historically standard period, to the second period, which may look entirely different. It is not to be expected that the result of the difference between both periods will be very high, variations in the monthly returns are fairly small. Nonetheless, there is a strong need for testing the difference, for the developed markets and separately, for emerging markets, as well. The paired t-tests need to be done twice, once for growth, GARP and value for developed markets and once for growth, GARP and value for emerging markets.

Third, to further test the possible change in the market, an XLSTAT extension was added into Microsoft Excel to perform a median mood test for the medians of all variables concerning both periods in both developed and emerging markets. This has been done to delineate the difference (or no difference) between the medians. Fourth, equivalence is tested by means of a paired data equivalence test (TOST) by the IQ macros add-in to Microsoft Excel. This will ensure that the means are not far different from one another. Fifth, a two-sample F-test for variances is utilized to test whether the means vary or do not vary in terms of normality. This has been achieved by an add-in of the QI Macros to Microsoft Excel. A Levene's test is a supplement to this test to verify whether normality is present. Sixth, also a covariance test has been executed by means of QI Macros, making sure the results do not covary, meaning they are random or not random at all. Seventh, since the testing involves time series, as the two periods concern returns over time a cointegration has been conducted by the Phillips-Oullaris cointegration test. This has been achieved by adding an R-essentials extension package to SPSS software. Eight, if it is random that the periods differ and hence the periods are normal and not a matter of definite change in the markets, low correlation would be present, hence a correlation analysis is performed between the two periods for all variables by means of the standard version of SPSS software.

Nineth, the mean returns for growth, GARP, and value in each data set, and separately for the fourth data set, need to be compared to derive what style outperforms what style significantly, for both periods and for each hypothesis. This will be done by another set of paired t-tests in the SPSS software. A paired t-test will be used to test

hypotheses one, two, three, and four because it needs to be tested whether the mean of one group outperforms the other. The first hypothesis will test whether the first group's mean GARP, outperforms the second group's mean, growth, in terms of returns. The second hypothesis will test whether value means outperform GARP means. The third hypothesis will test whether GARP means outperform value means. In the fourth hypothesis, the same outperformance is tested for GARP and growth means. Medians will be used to further detail the findings. XLSTAT for Excel is used for this purpose.

Tenth, it will be important to test variance, since high significant variance for a means test means unreliability, because there is more deviation from the mean with more spread means, while, eleventh, high covariance would lead to higher reliability of the outperformance, because the outperformance does not come from covariance, instead it comes from outperformance alone, while differing covariance within each hypotheses would lead to less reliability, because differing covariance would mean the outperformance is influenced by covarying stocks. Both variance and covariance will be tested by QI macros, the add-in for Microsoft Excel, with an F-test and a covariance test, respectively. Twelfth, high correlation as opposed to weak correlation would lead to higher reliability, as the outperformance of the means is not impacted by low correlation stocks and more related to actual outperformance. Thirteenth, a test for outliers is utilized, to test whether the e.g. outperformance, correlation, covariance, is unduly influenced by the presence of outliers. This again increases the reliability of this study. Fourteenth, a Shapiro-Wilk test and Kolmogorov-Smirnov test will be used to test the distribution of the findings, to test whether it is normally distributed. Fifteenth, skewness and kurtosis will be tested, for interpreting the findings further. For the tenth to the

fifteenth test, SPSS software will be utilized. For covariances however, QI Macros will be utilized.

Sixteenth, a correlation analysis is needed to test whether GARP buckets are highly correlated, and the same has to be done to value buckets. The same also goes for the growth buckets. The buckets of the variables differ widely in percentiles. GARP is tested on the 30th to the 70th percentile across markets, the 40th to the 60th across markets, and the 50th to the 75th across markets. Growth will be the 30^{th} percentile, the 20^{th} percentile and the 25^{th} percentile, across markets. Value would be 70^{th} to the 100^{th} , the 80^{th} to 100^{th}, and the 75^{th} to the 100^{th}, across markets. For making clear inferences and for reliability of the study, high correlation within respectively value, growth and GARP buckets, is highly desirable.

Ideally, the correlation coefficient for the growth, value and GARP buckets across the three data sets would be very high, at least 0.8 for each comparison, illustrating the results of this research. The emerging markets correlation analysis will be again be evidenced separately, by calculating correlations with the other data set, so not to spill-over into the other evidence when including it right away. It will therefore be more useful as additional, confirmatory or contradictory evidence, but it actually completes the design, and thereby enhances validity and reliability of this study. T-tests between the buckets will further detail the significance of the correlations.

Seventeenth, an F-test is needed to make sure there is little differing variance in between the buckets as high variance may degrade the correlation between the buckets.

Eighteenth, a covariance test is utilized to test the data further in relation to variance, and nineteenth if the buckets of each variable are highly similar, a cointegration test would lead to a significant outcome. Both an F-test and a covariance test will be executed by QI Macros added-in to Excel.

After performing all the data-analyses steps, the hypotheses were thoroughly tested and reliability was altered significantly. These combined will lead to a robust answer on the research questions, and this has more reliably occurred.

Parametric tests have been used almost exclusively in this study, because there is a need for defining the probability distribution of the data as can be illustrated in research theory of Kim (2015): “Parametric methods refer to a statistical technique in which one defines the probability distribution of probability variables and makes inferences about the parameters of the distribution”. Moreover, in this research, parametric tests are crucial as the probability distribution of the findings is highly important. Does one style outperform the other, how is this finding distributed, does the second period differ from the first period, is there correlation between the findings, how is this distribution? Does each bucket in every variable differ in developing markets? Is all of this significant? How is variance, covariance, distributed? Is there normality? Is there a normal distribution? How do the means differ? Are there outliers in the distribution? Is there kurtosis, skewness? Is their equivalence in the data, does the data differ? Is there cointegration in the time series (monthly return) data?

3.9 Research Design Limitations

Finally, there are some limitations to the design. A main limitation is that the changes in the market are fragile and fraught with uncertainty. At present, it looks like growth will keep outperforming value (e.g. Greenwald et al., 2020), however, there still is the possibility that the market will change back to the value outperforming growth, and value investors have always believed so (Greenwald et al., 2004), however, things seem to have changed for good, however, it is impossible to know with absolute certainty in advance whether this is just an unusual macro environment or a change for good (e.g. Cornell and Damodaran, 2021). Things may have altered, the research design and possibly the entire field may be insufficient to cope with future changes which cannot be predicted at this time.

A second main limitation is that in the period following the 31st of June 2023 to the present, changes in outperformance may have happened, since this period has not been included in the investigation because of the need for equal periods before and since the 1st of January 2007, which is the cutoff date. This might have affected the balance between value, growth and GARP, most likely, it has affected upwards GARP and growth performance. Hence, if GARP or growth would outperform in the second period, the reliability it really did is enhanced. If growth would outperform GARP, things look a little different. That would be a limitation. However, there are already nineteen data-analysis methods used in this study with additional data-analyses for emerging markets, more data-analysis tools which than also must be repeated for the emerging markets would be required to test something not directly related to the research question and testing the hypotheses would be a bridge too far and confusing. Moreover, the Kenneth French library at the time of writing only uses data until the end of April 2024. That means there are only eight more months of data at the time of writing, hence that would

conclusively be unworthwhile to make extra data collection and data-analysis techniques about as well.

A third limitation is that not every economy in the world is represented in the spreadsheet, absolute global data such as including small economies like Angola, Kenya and other poor countries are unavailable. However, the Kenneth French library is the largest and easiest ready-to-use library to use. Other options included Compustat Global or other large and expensive data providers which also a sole researcher has a hard time to afford, these do not have quasi-global ready-to-use data nor the reliable data for the purpose of completing the old paradigm based on B/M of which Professor Kenneth French is the co-author of value outperforming growth (Fama and French, 1998). Many authors use the Kenneth French library (e.g. Chiah et al., 2016), especially factor models authors (Glück et al., 2021). This data source contains the B/M factor, thus, it will be utilized in this research. If the objective of the research is to complete the old paradigm and construct a new, starting at the source is a great idea.

A fourth limitation is that the GARP bucket of the fourth data set is too broad. There are three buckets. The value and growth bucket are the correct percentiles. However, the GARP bucket or the neutral bucket is too broad. There was no additional emerging markets evidence, therefore no correlation analysis and none of the other steps related to testing the buck could be done to verify reliability by comparing it another data set. This may bias results of emerging markets results and conclusion if it differs much. However, this cannot be altered, though it is so that the results coming from the data (and the correlation and the other data-analysis techniques with the three other data sets which are done separately in this research) are additional evidence that will either confirm or reject the developed markets results.

3.10 Conclusion

The fitting of GARP within the old and the new paradigm has not been research. GARP's place in the old paradigm, where value outperforms growth, in a global model, is unclear. So is GARP's place in the new paradigm, where growth outperforms value. B/M is still the right metric to be used to test this as was delineated in the literature section. GARP will be the 50^{th} to the 70^{th} percentile since this is where GARP will tend to outperform the most, since buying more expensive is wrong following e.g. Graham (2005). Testing the given hypotheses presented in sub-section 3.3, and answering the given research questions in sub-section 3.3, following also from the previous chapters, is what will be attempted by the given method for this research. Completing the old and delineating the new paradigm are the purpose. In order to achieve these goals a quantitative research design based on numerical data and statistical tests analyzing this data will be utilized. Data-analysis software, more specifically, R and SPSS, will be utilized. The Kenneth French library (French, 2024) is the basis for collecting the data.

The data was attributed to growth, GARP and value buckets, also adding buckets to one another that were split in other factors such as small and large size (French, 2024). Equal periods were used for both periods, with the cutoff date of 1^{st} of January 2007. There are nineteen steps in the data analysis. All but one steps were intended to improve and assure reliability. The nineth step, which are paired t-tests of the means, will test the relative performance of growth, GARP and value. The entire data analysis procedures as part of the research design assure that testing of the hypothesis is fully reliable.

Following the descriptive statistics, STL's are utilized to smooth cyclicality that allows for visually comparing one period to the next, thereby visually illustrating the difference between the two periods, increasing reliability. This will be done for growth, value and GARP stocks respectively, thereby illustrating the difference between growth,

value and GARP performance in the two periods. The STL's will be repeated for emerging markets. A paired t-test will be performed for comparing growth, GARP and value buckets for both periods, illustrating that the difference between the buckets is present from one period to the next, supporting the tests because when it is clear GARP outperforms, the paired t-test supports that conclusion because both periods vary, hence the research will be more reliable. This also will be repeated for emerging markets and enhances reliability because if GARP outperforms, the difference will be clear. A median mood test will compare the medians of the two periods, whether these differ. This will also be tested in the other direction, a TOST-test will test the equivalence between the two periods. The change in variance of the two periods will be tested by a two-sample F-test for variances. A Levene's test will be used to determine what happens with variances when normality is not assumed. Finally, a Phillips-Oullaris cointegration test will be used to determine whether the two time series are cointegrated.

Paired t-tests, supplemented with median testing will be used to compare the variables and test how GARP fits within the old and new paradigm by comparing the means of the three groups. This is the most important step, testing the hypotheses. Then, an F-test is executed to test variances in the hypotheses and a covariance test to illustrate the distribution and the findings. Correlation analysis will also further illustrate these findings. Outliers will be tested and a Shapiro-Wilk test and a Kolmogorov-Smirnov test will be utilized to test the distribution of the findings, this will be further supplemented by an analysis of skewness and kurtosis.

A correlation analysis will test the correlation between the buckets over both periods. This is needed since the percentiles of the buckets of the data differ for growth, GARP and value across the data sets. High correlation will make sure the evidence is fully reliable. Emerging markets will be tested seperately, not to dilute the evidence of

developed markets, with that of emerging markets. The emerging markets data will be additional evidence. An F-test is needed to ensure differing variance between the buckets and a covariance test is utilized to test the data in relation to variance, and nineteenth, if the buckets of each variable are highly similar, a cointegration test would lead to a significant outcome. Almost all tests are parametric tests, as the distribution of the data, the variance, covariance, outliers, cointegration and more test are meant to evidence the distribution of the data around the mean changes of the variables in the hypotheses. Moreover, these tests are used to improve reliability of this study.

It is also needed to include that data to make sure a global model is researched. There are four data sets. Three consisting of similar developed markets data, and one on emerging markets data. The developed markets data differs in terms of percentiles for the buckets, among which growth, GARP and value are selected. Preparation of the data, placing the data of other factors in the right B/M buckets, is needed before data-analysis can happen. There are four limitations to the research design. The first is that there is an inability to forecast what will happen to the model into the future as there is some doubt on the future of the model. A second limitation is that there is some time that is not included since the second period ended. This may mean that there could be changes. The third limitation is that poor countries such as African countries were not included for testing global markets. A fourth limitation is that the GARP bucket of the fourth data set is too large and hence more unreliable. All these limitations were relativated.

CHAPTER IV:

RESULTS

4.1 Introduction

Throughout this chapter, the results are evidenced with the objective of reliably testing the hypotheses and answering the research questions. The outline is as follows. Sub-section 4.2 will discuss descriptive statistics on the variables in developed markets (across the percentile-based bucket) and the variables in the emerging markets. In sub-section 4.3, the STL's of the variables will be depicted and interpreted for showing the changes from the first to the second period for developed and emerging markets separately. In sub-section 4.4, the two periods will be compared by a paired t-test, a mood test, TOST-test, an F-test, a Levene's test, a covariance test, a Philips-Oullaris test and a correlation test, for the variables in each time period for developed and emerging markets, again separately. In sub-section 4.5, the four hypotheses will be tested by a t-test, each hypothesis will be evidenced for developed followed by emerging markets. In sub-section 4.6, additional tests will be executed for testing outperformance. An F-test, a test for outliers, a Shapiro Wilk test, a Kolmogorov-Smirnov test, a test for skewness and kurtosis will be performed. In sub-section 4.7, all of this will lead to insights on research question one. In sub-section 4.8, insight on research question two follows. In sub-section 4.9, more insights on answering the research questions will be addressed. In sub-section 4.10 a correlation analysis concerning the buckets of the variables in developed markets will be performed, followed by an F-test, a covariances test, and a cointegration test . In sub-section 4.11, a summary of findings is presented followed by a conclusion in sub-section 4.12.

4.2 Descriptive statistics

4.2.1 Developed markets descriptive statistics

The growth data across percentiles in the first period has substantially more range for the 30th percentile bucket of the first data set, though it does not have substantially higher mean monthly returns than the growth buckets of the second and third data set. The second and third data set demonstrate little differences amongst the growth buckets, except for the variance, which also is much higher for the first data set.

In the second period, mean monthly returns for growth are higher than in the first period. The range also is also higher. So they are the minima and maxima more spread. In the second period, growth appears to become more important. The mean monthly returns of the 30th percentile bucket of the first data set are lower, but not substantially lower than the 20th percentile bucket of the second data set, yet higher but not substantially higher than the 25th percentile bucket of the third data set. The range is higher for the 30th percentile bucket of first data set, while the range of the 20th percentile bucket of the second data set is lower than for the 25th percentile bucket of the third data set. All of the data sets presented here seem quite similar.

The growth data across percentiles in the first period has substantially more range for the 30th percentile bucket of the first data set, though it does not have substantially higher mean monthly returns than the growth buckets of the second and third data set. The second and third data set demonstrate little differences amongst the growth buckets, except for the variance, which also is much higher for the first data set. All of the data related to growth can be found in Panel A of table 4.1.

Panel A: growth	Range	Min.	Max.	Mean	Variance
30th	26,66	-14,28	12,38	,4778	24,751

30th	38,16	-23,44	14,72	,5236	28,151
20th	22,16	-11,75	10,41	,4672	16,555
20th	34,98	-21,47	13,51	,5502	20,575
25th	23,81	-12,58	11,23	,4661	21,127
25th	36,63	-22,16	14,47	,5013	26,272
Panel B: GARP					
30th to the 70th	23,97	-12,76	11,21	,8054	16,394
30th to the 70th	34,95	-21,36	13,60	,4949	23,977
40th to the 60th	25,55	-14,10	11,45	1,0021	15,421
40th to the 60th	34,28	-19,96	14,33	,5198	24,116
50th to the 75th	25,34	-13,29	12,05	,9487	15,036
50th to the 75th	35,40	-20,94	14,46	,5150	24,438
Panel C: Value					
70th to the 100th	27,18	-13,47	13,71	1,0633	17,169
70th to the 100th	36,73	-21,15	15,58	,5294	26,236
80th to the 100th	27,46	-13,58	13,89	1,1829	17,608
80th to the 100th	38,39	-22,40	16,00	,5732	27,786
75th to the 100th	26,65	-13,21	13,45	1,1248	17,203
75th to the 100th	36,65	-21,47	15,18	,5570	26,387

Table 4.1:developed markets: descriptive statistics

In the second period, mean monthly returns for growth are higher than in the first period. The range also is higher. So are the minima and maxima more spread. In the second period, growth appears to become more important. The mean monthly returns of

the 30th percentile bucket of the first data set are lower, but not substantially lower than the 20th percentile bucket of the second data set, yet higher but not substantially higher than the 25th percentile bucket of the third data set. The range is higher for the 30th percentile bucket of first data set, while the range of the 20th percentile bucket of the second data set is lower than for the 25th percentile bucket of the third data set. All of the data sets presented here seem quite similar. The statistics leading to this analysis can be found in Panel A of table 4.1.

Descriptive statistic regarding GARP, can be found in Panel B of table 4.1. The mean monthly returns of the widest GARP bucket, as to be expected, are the lowest, substantially lower than the narrower buckets, however, the range is similar so are the maxima and minima and so is the variance, which means that the buckets are comparable in the first period.

The range is much higher for the second period, as are the minima and maxima as is the variance. The second period again is different. GARP seems to become less important. Mean monthly returns are lower. The range, the minima and maxima, the mean returns, and the variance of the second period are widely similar, which means that the GARP buckets, including the wide bucket, are widely comparable.

The statistics regarding value in developed markets can be found in Panel C of table 4.1. Value has high means in the first period, the highest of all the strategies, thereby demonstrating the value premium of e.g. Fama and French (2021). It has similar range, minima, maxima, variance, only the means differ somewhat.

The difference with the outperformance in the first period emerges in the second period. The performance of value seems to go down dramatically. However, value mean monthly returns seem similar to GARP and growth in the second period, but value does

seem to have slightly the upper hand in terms of mean monthly returns, compared to growth and GARP, although the difference is very small. In the second period, value seems to have similar range, minima, maxima, and slightly differing mean monthly returns and variance, across percentiles.

4.2.2 Emerging markets: descriptive statistics

Emerging markets data seems to depict higher mean monthly returns for value, with GARP having second-best mean monthly returns followed distantly by growth. This was to be expected in the first period. The range is substantially higher than in developed markets, so is the variance. There are lower minima and higher maxima. The mean monthly returns go down substantially from the first period to the next.

Again, similar to the first period but now more significant, in the second period value has the highest mean monthly returns substantially higher than GARP, followed distantly by growth, in contrast to what was to be expected. In the second period the range, the variance (except for growth), and the minima are even higher. The maxima are high, slightly lower than in the first period. All of the statistics for growth, GARP and value in emerging markets can be found in table 4.2.

	Range	Min.	Max.	Mean	Variance
Growth	41,52	-22,67	18,86	,6312	35,946
Growth	45,94	-27,77	18,17	,3112	33,401
GARP	40,69	-23,76	16,93	1,2043	35,987
GARP	44,96	-27,06	17,90	,4881	36,166
Value	42,79	-19,80	23,00	1,4936	36,669
Value	48,28	-28,45	19,83	,7269	39,013

Table 4.2: Emerging markets descriptive statistics

4.2.3 Research question one

Out of the preliminary evidence of the descriptive statistics, research question one is indicated to be supported. Value outperforms GARP, while GARP outperforms growth by a large margin.

4.2.4 Research question two

Out of the preliminary evidence, there seems to be little support for the outperformance of growth, and the underperformance of value. Value still has slightly higher mean monthly returns than GARP, followed by growth. It is unclear whether any strategy outperforms, the differences in mean monthly returns are minor. This indicates that the paradigm might not have shifted or it might be it did, but that is not apparent. The emerging markets still show large outperformance for value, followed by GARP and then growth.

4.3 STL

4.3.1 STL for developed markets

When performing an STL, it becomes clear that for growth in developed markets, the second period trend in returns is more or less the same, in terms of ups and downs, than in the first period, but quite impossible to determine which period outperforms with the naked eye. This is consistent with the descriptive statistics where growth performance goes slightly up only marginally from the first period to the next.

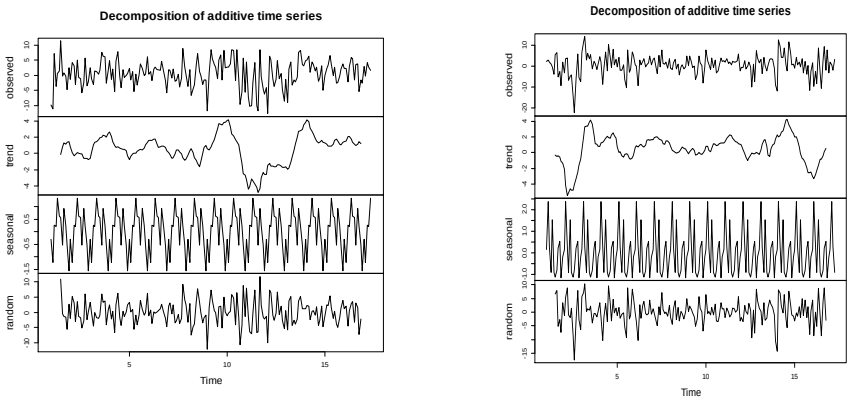

Figure 4.1: Growth stocks returns before and after 2007: developed markets

.

The difference between the first period and the second period for value in the emerging markets again is hard to tell with the naked eye. But when looking at the scale, the first period has a higher peak than the second one. More importantly, the first STL mostly is above zero, while in the second more of the STL is below zero with a trough of minus four. Value underperforms in the second period relative to the first period. These periods differ substantially.

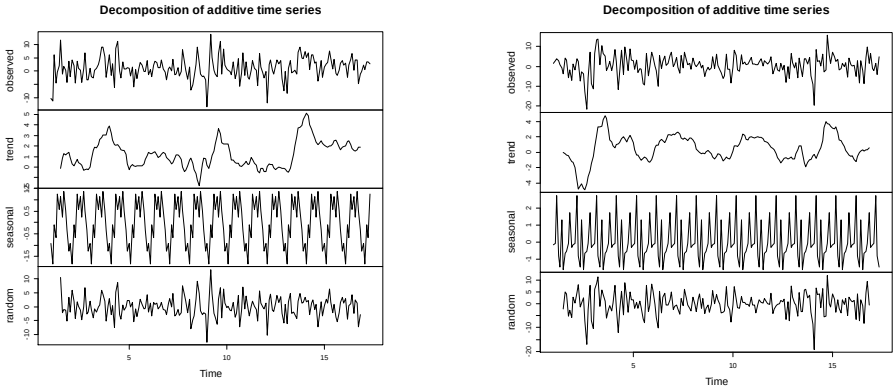

Figure 4.2 : Value stock returns before and after 2007: developed markets

GARP seems to have much ups and downs regardless of time period, though it has a slightly bit smoother of a trend in the second period. When looking at scale of figure 3, again, there is much more positive presence with in the first period, with the scale counting higher upwards in the first period. The second period hovers around zero to a large extent. The performance of GARP performance has declined.

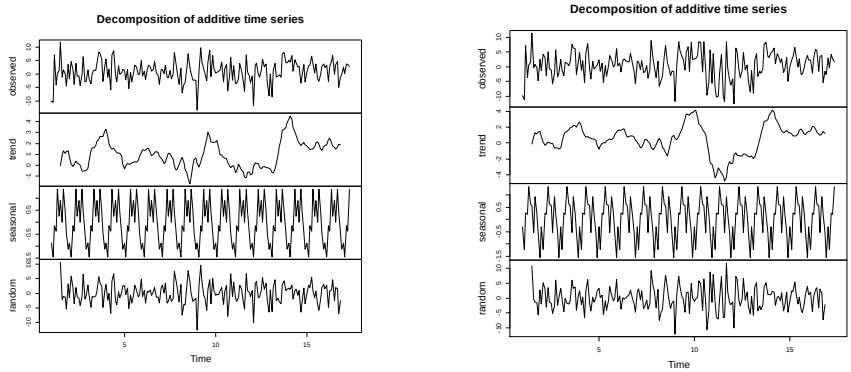

Figure 4.3: GARP stock returns before and after 2007: developed market

4.3.2 STL for emerging markets

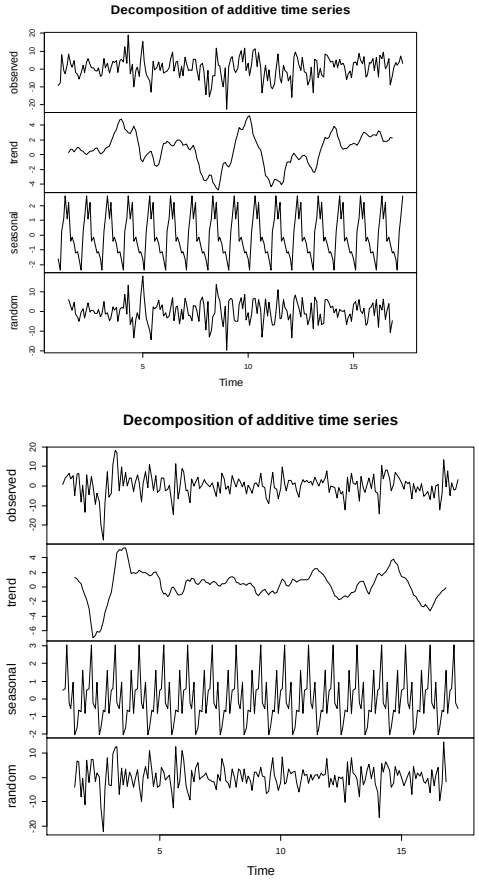

Figure 4.4: Growth stock returns before and after 2007: emerging markets

According to the STL, growth in the second period hovers around zero more than any other STL in this research, it indicates worse performance. The first period's STL is better and more mixed, but still does not show impressive performance.

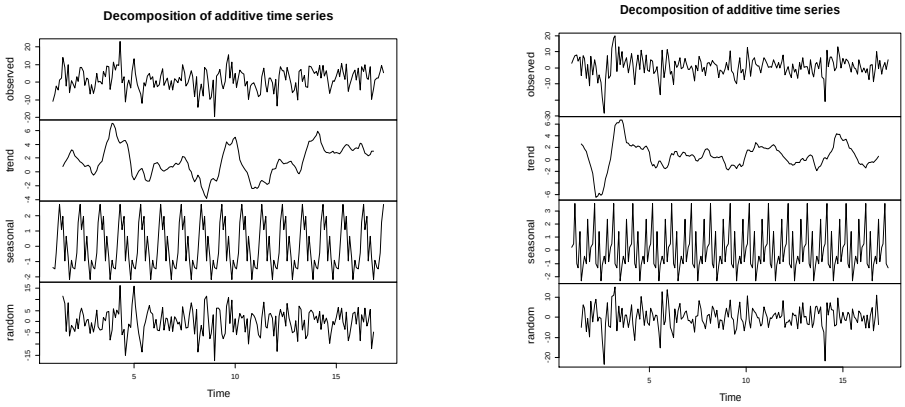

Figure 4.5: Value stock returns before and after 2007: emerging markets

According to the STL, in the first period, value fluctuates between more or less zero and four most of the time, with lows of minus four. While the STL of the second period hovers around two with one low of minus 6! The performance in the second period is substantially worse than in the first period.

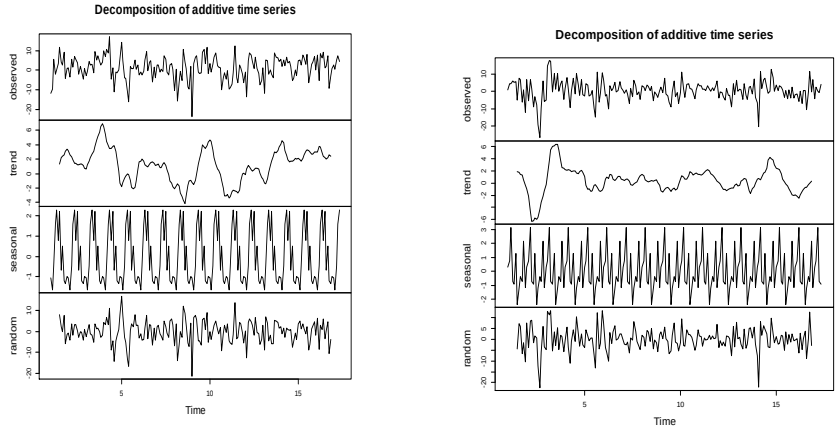

Figure 4.6: GARP returns before and after 2007: emerging markets

GARP seems to substantially drop in performance from the first period to the second period. The STL is mostly in positive territory and shooting up well above zero in the first period and in the second period it hovers around zero with a few upshoots. GARP performs less in the second period than in the first period.

4.3.3 STL: conclusion

The performance of value goes down a substantially for developed markets. Growth does not seem to visually have material changes in performance, going slightly up in the first period, as the only variable in all of the STL's. The performance of GARP declined. In emerging markets, all performance declined. Overall, it is not consistently clear that the two periods differ, although there seem to be large changes in some of these STL's from the first period to the next.

4.4 Comparing the two periods

4.4.1 Paired t-tests: quantifying the difference

Consistent with the descriptive statistics and the STL's, growth has slightly more mean performance in developed markets during the second period (M=0.5253, SD=4.96749) than in the first period (M = 0.4702, SD = 4.51928). However, the difference between returns is barely present and highly insignificant: $t(197) = -0.113$, $p = 0.455$. In contrast to what was expected, both periods are highly similar, hence they do not significantly differ.

Consistent with the descriptive statistics and the STL's, GARP has better performance in developed markets than growth but lower performance in the second period (M = 0.5099, SD = 4.90801) than in the first period (M = 0.9189, SD = 3.93685), Again, though the difference between the two periods is more present than in the growth variable, but still highly insignificant: $t(197) = 0.899$, $p = 0.185$. Both periods are comparable.

Consistent with the descriptive statistics and the STL's, value performs extremely well in the first period in developed markets (M = 1.1235, SD = 4.15478), but performs much worse in the second period (M = 0.5531, SD = 5.17076). The change in

performance from the first to the second period is the largest of all changes in the developed markets, however it is still highly insignificant: t(197) = 1.186 p = 0.119.

Consistent with the descriptive statistics and the STL's, growth in emerging markets has fairly mediocre returns in the first period (M = 0.6312, SD = 5.99549), but halves in performance in the second period, with outright bad performance then, the lowest of all statistics (M = 0.3112, SD = 5.77933). The change in performance in the emerging markets of growth is small and highly insignificant: t(197) = 0.521, p = 0.301. Again, there is no evidence on a changing market from the first period to the next. There is no evidence of a large change from the first period to the second period.

Consistent with the descriptive statistics, GARP in the emerging markets has outright great performance in the first period (M = 1.2043, SD = 5.99889), only to massively go down in performance, performing very bad in the second period (M = 0.4881, SD = 6.01380). The change is similar, yet slightly lower to value's change with the developed market, with similar, yet slightly lower but still present high insignificance: t(197) = 1.151, p = 0.126. No changes in the market from the first to the second whatsoever.

Consistent with the descriptive statistics and the STL's, value in emerging markets has the highest performance of all markets and of all variables in the first period (M = 1.4936, SD = 6.05552). In the second period, performance goes down dramatically, yet still is the highest of all variables in the emerging markets (M = 0.7269, SD = 6.24605). The changes from the first period to the second are the largest and the least significant of all changes, similar to value in the developed markets, but still highly insignificant: t(197) = 1.188, p = 0.118. The market has undergone no change. Table 4.3 below illustrates mean, the t-statistics and the p-value from all what has been discussed so far in this sub-section.

Markets	Strategy/period	Mean	Median	Median mood test p value	t-statistic	t-statistic p-value
Developed	Growth 1	0.4702	0.815	0.569	-0.113	0.455
Developed	Growth 2	0.5233	0.755	0.569	-0.113	0.455
Developed	GARP 1	0.9189	1.080	0.479	0.899	0.185
Developed	GARP 2	0.5099	0.795	0.479	0.899	0.185
Developed	Value 1	1.1235	0.965	0.486	1.186	0.119
Developed	Value 2	0.5531	0.940	0.486	1.186	0.119
Emerging	Growth 1	0.6312	0.9025	0.528	0.521	0.301
Emerging	Growth 2	0.3112	0.4950	0.528	0.521	0.301
Emerging	GARP 1	1.2043	1.7275	0.507	1.151	0.126
Emerging	GARP 2	0.4881	0.5575	0.507	1.151	0.126
Emerging	Value 1	1.4936	1.4650	0.486	1.188	0.118
Emerging	Value 2	0.7269	0.7125	0.486	1.188	0.188

Table 4.3: paired t-test for the two periods

4.4.2 Median mood test

The median mood test has resulted in the fact that for all variables in all markets, the median did not show significant change during both periods as the p value of the median "mood" test was always substantially higher than 0.05. The data regarding the median mood test is demonstrated in the table 4.3 above.

4.4.3 TOST-test, F-test and Levene's test

There is no significant change in means from one period to the next for all strategies. Further testing is obviously needed. Equivalence testing is necessary because as demonstrated above the means do not differ, and the insignificance in the previous test might implicate the means remained the same. A TOST-test is performed in table 4.4 below.

Growth developed		
t Statistic	-0,113	
P Values	0,545	0,455
GARP developed		
t-statistic	0,899	
P Values	0,185	0,815
Value developed		
t-statistic	1.186	
P values	0.119	0.881
Growth emerging		
t Statistic	0.521	
P Values	0.302	0.698
GARP emerging		
t-statistic	1.151	
P-values	0.126	0.874
Value emerging		
T Statistic	1.188	
P-values	0.118	0.882

Table 4.4: TOST-test

As demonstrated above in table 4.4, even in the TOST-test, statistics demonstrate insignificance for every strategy for every market. Hence, means do not differ, nor are the means equivalent. Then it might be that the results just vary, hence a two sample F-test for variances has been utilized. Table 4.5 presents the results regarding this F-test.

Growth developed			
F-statistic	1.21		
P values: one-tail, two tail	0.093	0.185	

GARP developed			
F-statistic	1.55		
P values: one-tail, two tail	0.001	0.002	
Value developed			
F-statistic	1.55		
P values, one-tail, two tail	0.001	0.002	
Growth emerging			
F-statistic	1.08		
P values, one-tail, two tail	0.303	0.606	
GARP emerging			
F-statistic	1.00		
P-values, one-tail, two-tail	0.486	0.973	
Value emerging			
F-statistic	1.06		
P-values, one-tail, two-tail	0.332	0.665	

Table 4.5: F-test

Growth was found to be insignificantly varying from the first period as compared to the second in the developed markets. This is not surprising since growth had no large change in means, as demonstrated in the descriptive statistics, while no strategy in emerging markets was found to be significantly subject to variance. In the developed markets, there is significant variance from the first period to the second, specifically for value and GARP. This can be explained by Fama (1965): Stock patterns do not behave the same over time. The price level of a stock is not predictable nor is its pattern (e.g. Fama, 1965). Hence, returns could be neither significantly different nor significantly similar, and hence there might be some significant variance in returns. The situation in the second period looks like a normal stock market episode and hence is not different as delineated in the theory section.

A check of variance regardless of normality was executed by a Levene's test of variances. The results can be viewed in the table 4.6 below.

Growth developed	
Levene's Test	0.005
P value	0.942
GARP developed	
Levene's Test	3.212
P value	0.074
Value developed	
Levene's test	4.179
P value	0.042
Growth emerging	
Levene's test	1.026
P value	0.312
GARP emerging	
Levene's test	0.521
P-value	0.471
Value emerging	
Levene's test	0.134
P-value	0.715

Table 4.6: Levene's test

Only value in developed markets seemed to have significant difference in variances, regardless of normality. Hence, normality is important, as the variances are significant in more cases as compared to only with value when normality is absent.

4.4.4 Covariance test, Philips-Oullaris test, correlation test

This randomness can further be found by testing the covariances of the two periods. Covariances are negative throughout, meaning the two periods do not covary positively, but negatively, thus the performance is not very much linked and thus is random, meaning these are just quite random period compared to one another. The covariances can be found in table 4.7 below.

Growth developed	-0.770

GARP developed	-0.713
Value developed	-0.896
Growth emerging	-2.683
GARP emerging	-2.246
Value emerging	-3.369

Table 4.7: covariance test

As has been stated, it must be the case that the data in the two periods are quite normal. Also, the data are time series data that need some special treatment in order to be deemed normal or equivalent, in other words, there needs to be a cointegration test. There are two time series that need to be tested for cointegration. In order to confirm cointegration in the time series of this study, a Phillips-Oullaris cointegration test has been executed. This has been achieved by adding an R-essentials extension package to SPSS. Each variable of the first period has been compared with the second period. This has resulted in significant cointegration with p-levels of 0.01 for all variables. The results of the cointegration test can be found in table 4.8 below.

Growth developed	0.01
GARP developed	0.01
Value developed	0.01
Growth emerging	0.01
GARP emerging	0.01
Value emerging	0.01

Table 4.8: Phillips-Oullaris test

If periods would be random or normal, it can be argued correlation between the two periods for all variables would be random or in other words would be marginal and insignificant as well. As can be seen in the table below, this is the case. Hence, the two periods do not differ, when incorporating normality and other statistics, because this is a

normal stock market episode. The correlation and its significance level can be found in table 4.9 below.

	Pearson correlation	Significant
Growth developed	-0.034	0.630
GARP developed	-0.037	0.604
Value developed	-0.042	0.558
Growth emerging	-0.078	0.276
GARP emerging	-0.062	0.382
Value emerging	-0.089	0.210

Table 4.9: correlation test

4.4.5 Conclusion

The visual evidence of the STL's and the desciptive statistics and the changes of the first period to the second are becoming more clear now. The overall markets performed slighly worse in the second period than in the first period, besides growth in developed markets which improved performance, although there were larger differences in performance from the first period to the next. However, following from the paired t-test, there are no significant changes occuring in the market, not in developing nor in emerging markets. The mean did not change signficantly nor did the median in a separate mood test. Nor were the means significantly equivalent for none of the strategy. That followed from the paired equivalence TOST-test. However, some means do vary significantly, more specifically the value and the GARP strategy. That followed from the two-sample F-test for variances. The pattern of returns seems a random one. There is no signficant change in means across the two periods, nor is there a signficant similarity, there however is some variance. These looks like normal stock market episodes. This also follows from a levene's test, there's less significance in the levene's test where normality

is not assumed, than in the F-test, illustrating both periods are normal. Covariances confirm this as well. Performance is not linked, but random. Furthermore, a cointegration test demonstrated clear normality between the time series. Finally, if the two periods were normal periods where no patterns can be predicted (Fama, 1965), then correlation would be low and insignificant. This is the case. The statistics do not imply a change in normality of one period to the next. Hence, there are no substantial changes in the market since 2007 as was hypothesized.

4.5 The hypotheses: tests

4.5.1 Paired t-test: Hypothesis 1

Consistent with the previous analyses, GARP (M = 0.9189, SD = 3.93685) has higher performance than growth (M = 0.4702, SD = 4.51928) in the first period. Consistent with what has been shown before, GARP outperforms growth by a large margin and this result is highly significant: t(197) = 3.496, p = <0.01. In terms of medians, GARP performed even better (median = 1.080), but so did growth (median = 0.815). There is no significant change in direction arising from the evidence of the medians. Clearly, there is a lot of evidence supporting the outperformance of GARP over growth.

In emerging markets, the same can be argued, GARP (M = 1.2043, SD = 5.99889) has higher means than growth (M = 0.6312, SD = 5.99549). GARP outperforms growth by a large margin, even more than in developed markets, and this result is highly significant: t(197) = 4.069, p = <001. The median seems to support this finding as GARP has the highest median (median = 1.7275) of all strategies and market with growth having also a high median (median = 0.9025), the difference being insignificant.

4.5.2 Hypothesis 2

Consistent with the previous output and analyses, value (M = 1.1235, SD = 4.15478) has higher performance than GARP (M = 0.9189, SD = 3.93685). Value clearly outperforms GARP, and this result is again highly significant: t(197) = 3.483, p = <0.01. However, the median of GARP is somewhat similar, yet insignificant, slightly higher (median = 1.080) than the median of value (median = 0.965), demonstrating that the presence of GARP in the paradigm is strong.

Value (M = 1.4936, SD = 6.05552) has higher performance than GARP (M = 1.2043, SD = 5.99889). However, the outperformance is insignificant, indicating the strength of the GARP stock: t(197).= 1.889, p = 0.30. Value (median = 1.4650) has a substantial lower, but insignificant, median than GARP (median = 1.7275).

4.5.3 Hypothesis 3

In the second period, GARP (M = 0.5099, SD 4.90801) has slightly lower performance than value (M = 0.5531, SD 5.17076). GARP does not significantly outperform value: t(197) = -0.592, p = 0.277. The median of value (median = 0.940) is higher than the median of GARP (median = 0.795), this is not significant, supporting the rejection of the hypothesis, as a result of the insignificant underperformance of GARP over value.

Remarkably, value still outperforms GARP in emerging markets. When comparing GARP (M = 0.4881, SD = 6.01380) with value (M = 0.7269, SD = 6.24605), GARP highly significantly underperforms value in emerging markets: t(197) = -2.842, p = 0.02. Hence, while developed markets are mixed, in emerging markets, value still significantly

outperforms GARP. The median of value (median = 0.7125) is higher, but not significantly higher than the median of GARP (median = 0.5575) seems to offer support for these findings.

4.5.4 Hypothesis 4

GARP (M = 0.5099, SD = 4.90801) has slightly lower performance than growth (SD = 0.5253, SD = 4.96749) in the second period. However, there is highly insignificant outperformance of GARP over growth in developed markets: t(197) = 0.143, p = 0.443. The median of growth (median = 0.755) though is slightly lower than the median of GARP (median = 0.795). This supports the insignificance of the outperformance of GARP over growth in developed markets.

GARP (M = 0.4881, SD = 6.01380) has higher performance than growth (M = 0.3112, SD = 5.77933) in emerging markets. GARP outperforms growth significantly in emerging markets: t(197) = 1.760, p = 0.04. However, GARP (median = 0.5575) outperforms growth (0.4950) only minorly in terms of medians and does not outperform significantly in terms of medians. The complete test results on the hypotheses can be gauged in the table 4.10 below.

Markets	Hypothesis	Significance Median Outperformance	t-statistic	t-statistic p-value	Significance mean outperformance
Developed	1	Insignificant	3.496	<0.01	Highly significant
Emerging	1	Insignificant	4.069	<0.01	Highly significant

Developed	2	Insignificant	3.483	<0.01	Highly Significant
Emerging	2	Insignificant	1.1889	0.30	Insignificant
Developed	3	Insignificant	-0.592	0.277	Insignificant
Emerging	3	Insignificant	-2.842	0.02	Significant
Developed	4	Insignificant	0.143	0.443	Insignificant
Emerging	4	Insignificant	1.760	0.04	Significant

Table 4.10: outperformance t-test and median outperformance test

4.6 Additional tests for outperformance

4.6.1 F-test of variances

An F-test was performed to determine variances between the variables in each hypothesis for developed and emerging markets separately. Only in the first hypothesis of the developed markets, was there variance in the data. Variance would lead to more widespread results, hence causing more variability hence less reliability since the evidence points in differing direction. All results arising from the tests of outperformance must be pretty conclusive and more reliable as there is little variance in the data.

There also is high covariance, the most in emerging markets, the least in developed markets. The first two hypotheses in developed markets have the lowest covariance, since in each box of covariance the stocks do not differ much in terms of covariances. The result of the hypotheses is again more reliable. Because with covariance, as one stock improves when the other does and it does that in a strong degree as in each of these cases, then the

outperformance of the stocks is not subject to low covariance, hence it is more reliable that the stock patterns do not deviate and the result comes solely or more or less solely from the outperformance alone. Remember, that the two stock markets periods were normal, which only strengthens what is found here. There's little variance as well, there is little difference in performance between each pair of variables, except for GARP versus growth in hypothesis one. Thus, the results by the t-test that tests the hypotheses in this study are fairly reliable. The results of the variance test and the covariance test are depicted in table 4.11 below.

Hypothesis/markets	Variables	F-statistic	P one-tailed	Significantly different variances?	Covariances
Hypothesis 1/ developed	GARP versus growth	1.32	0.027	Yes	Growth: Growth 20,321; GARP 16,248 GARP: Growth 16,248; GARP 15,421
Hypothesis 2/ developed	Value versus GARP	1.11	0.225	No	GARP: GARP 15,421; Value 15,958 Value: GARP 15,958; Value 17,175
Hypothesis 3/ developed	GARP versus value	1.11	0.232	No	GARP: GARP 23,967; Value 24,759 Value: GARP 24,759; Value 26,602
Hypothesis 4/ developed	GARP versus growth	1.02	0.433	No	Growth: Growth 24,551; GARP 23,126 GARP: Growth 23,126; GARP 23,967
Hypothesis 1/ emerging	GARP versus	1.00	0.479	No	Growth: Growth 35,792; GARP 33,854 GARP: Growth 33,854; GARP 35,828

	growth				
Hypothesis 2/ emerging	Value versus GARP	1.02	0.448	No	GARP: 35,828; Value: 33,857 / Value: 33,857; 36,509
Hypothesis 3/ emerging	GARP versus value	1.08	0.298	No	GARP: 36,003; Value: 36,725 / Value: 36,725; 38,839
Hypothesis 4/ emerging	GARP versus growth	1.08	0.289	No	GARP: 33,251; Growth: 33,632 / Growth: 33,632; 36,003

Table 4.11: additional F-tests and covariance tests

Supporting evidence also comes from the correlation analysis. The variables in each hypothesis are almost perfectly and significantly correlated. Therefore, the differing means are caused by outperformance or underperformance and not by weak correlation. These results are shown in table 4.12 below. The t-statistics are added to this table.

Variables	Pearson correlation	p-value	t-statistic	t-statistic p-value
Developed/GARP versus growth	0.918	<0.001	3.496	<0.01
Developed/Value versus GARP	0.981	<0.001	4.069	<0.01
Developed/GARP versus value	0.981	<0.001	3.483	<0.01

Developed/GARP versus growth	0.953	<0.001	1.1889	0.30
Emerging/GARP versus growth	0.945	<0.001	-0.592	0.277
Emerging/Value versus GARP	0.936	<0.001	-2.842	0.02
Emerging/ GARP versus value	0.982	<0.001	0.143	0.443
Emerging/GARP versus growth	0.972	<0.001	1.760	0.04

Table 4.12: correlation analysis for outperformance

4.6.2 Outliers, Shapiro-Wilk test and Kolmogorov-Smirnov test

There is low variance for almost all hypotheses, high covariance, high correlation. It becomes an issue whether there are outliers in the data. The data does not go lower than -28.45 and no higher than 23.00 as can be seen in table 4.13 below. There no extremities in the outliers in the data, meaning it is best not to remove any outliers. This illustrates that the data is reliable and normal.

Variable/period	Market	Highest	Lowest
Growth 1	Developed	11.34	-12.74
Growth 2	Developed	13.93	-22.36
GARP 1	Developed	11.57	-13.38
GARP 2	Developed	14.10	-20.75

Value 1	Developed	13.68	-13.42
Value 2	Developed	15.58	-21.67
Growth 1	Emerging	18.86	-22.67
Growth 2	Emerging	18.17	-27.77
GARP 1	Emerging	16.93	-23.76
GARP 2	Emerging	17.90	-27.06
Value 1	Emerging	23.00	-19.80
Value 2	Emerging	19.83	-28.45

Table 4.13: outliers detection

Because normality is an assumption and most of the testing in this research relies on normality, it becomes natural to test whether the data rests on a normal distribution. This can be achieved by a Shapiro-Wilk test and a Kolmogorov-Smirnov test. The results of these tests are demonstrated in table 4.14 below.

Variable/period	Market	Shapiro Wilk statistic	p-value	Kolmogorov-Smirnov	p-value
Growth 1	Developed	.980	.006	.056	.200*
Growth 2	Developed	.957	<.001	.085	.001
GARP 1	Developed	.982	.012	.045	.200*
GARP 2	Developed	.962	<.001	.095	<.001
Value 1	Developed	.981	.008	.056	.200*
Value 2	Developed	.962	<.001	.093	<.001
Growth 1	Emerging	.979	.005	.062	.063

Growth 2	Emerging	.957	<.001	.074	.010
GARP 1	Emerging	.973	<.001	.058	.097
GARP 2	Emerging	.957	<.001	.074	.011
Value 1	Emerging	.989	.133	.042	.200*
Value 2	Emerging	.960	<.001	.065	.042

4.14 Shapiro Wilk and Kolmogorov-Smirnov tests

The Shapiro wilk test concludes high statistics throughout, yet it is significant besides for one case, where it lags in significance, hence indicating it is not a complete normal distribution. The Kolmogorov-Smirnov test demonstrates an unsignificant normal distribution in every period one variable. Clearly the second period is more volatile than the second period. Generally speaking, if there is an entirely abnormal distribution, then there must not be kurtosis of exactly 3, if it is less than three then the data is platycurtic (Ho and Yu, 2015). The kurtosis is less than 3 throughout, with three exceptions in the emerging markets, hence it is overwhelmingly platykurtic, and there are less outliers than in a normal distribution, which explains the lack of outliers (Turney, 2024). Platykurtic data means uniform distributions (Turney, 2024), which clearly is the case with returns. Hence, the data consist of a uniform distribution throughout which means data is similar or normal in a uniform respect. That is why there are no outliers and maximum and minimum, as can be found in the descriptive statistics, even out. And the mean monthly return of all variables is slightly positive always above zero. Generally speaking, a uniform distribution also has a skew of zero (Turney, 2023), in the data, in all cases, it is slightly below zero, always more than minus 1. And that all means that the tests that have been performed, are all consistent, the results all correlate highly, there is low variance, high covariance, this all is consistent with the uniform distribution. This leads to the

outcome of the hypotheses. As the hypotheses are all defined by all of these statistical facts. Skewness and kurtosis of the variables in developed markets and emerging markets for both time periods are depicted in table 4.15 below.

Variable/period/markets	Skewness	Kurtosis
Growth 1: developed	-0.486	0.349
Growth 2: developed	-0.749	2.451
GARP 1: developed	-0.451	1.101
GARP 2: developed	-0.666	2.262
Value 1: developed	-0.218	1.326
Value 2: developed	-0.690	2.482
Growth 1: emerging	-0.519	1.239
Growth 2: emerging	-0.701	3.382
GARP 1: emerging	-0.703	1.339
GARP 2: emerging	-0.612	3.029
Value 1: emerging	-0.214	0.809
Value 2: emerging	-0.641	3.035

Table 4.15: skewness and kurtosis acrross markets and vairabiles

4.7 Research question one

According to the t-test, GARP outperforms growth significantly in developed and emerging countries in the first period. The medians point in the same direction. However, these although both growth and GARP are higher in terms of medians, GARP outperformed growth by a large margin.

Value outperforms GARP in terms of means significantly in developed markets and insignificantly in emerging markets. However, in both markets, the median is higher for GARP than for value, indicating the robust presence of GARP in the value outperforming growth paradigm. GARP is almost as strong as value.

4.8 Research question two

In developed markets, GARP does not outperform growth significantly, not in terms of means or in terms of medians. In emerging markets GARP outperforms growth significantly. Value outperforms GARP significantly, in terms of means, in emerging markets, but not in terms of medians. It was hypothesized that GARP would outperform both growth and value. There seems to be no evidence of this.

4.9 Answering research questions

The results on research question one and two seem to be supported by the underlying evidence. There is little variance in the data concerning the variables in the hypotheses. Only in the first hypothesis of the developed markets, was there change in the variance in the data. More change in variance results in more variability in the data around the results, and hence less reliability. There also is high covariance meaning the results come from the outperformance. Supporting evidence also comes from a significant almost perfect correlation between the variables in the hypotheses. High correlation means the outperformance is not distorted by other factors. There are little outliers and the kurtosis is lower than three meaning it is platykurtic and meaning the data is uniformly distributed. This also explains the little variance, high covariations being constant within each hypothesis in each market, high correlations, and lack of outliers. Hence, with all this data and the data collected before the testing of the outperformance by means of the paired t-test, detailing the

normality of the stock market episodes in both periods, at this stage, the research questions can be answered fairly reliably.

4.10 The buckets: developed only

4.10.1 Correlation among buckets

As has been indicated in the method section, only the developed market need this test as these have widely varying buckets. This test will increase reliability for the developed markets and address limitations. For growth, the three buckets are almost perfectly correlated and these correlations are highly significant ($p = <0.001$), the t-statistic is very low, and very insignificant, as can be found in table 4.16.

GARP seems to be have highly correlated buckets as well. Correlation among GARP buckets is also almost perfect and highly significant ($p = <0.001$) as can be seen in table 4.16. Surprisingly, the means differ a lot, the t-statistic is very negative and highly significant between the first two pairs but insignificant for the third pair.

There is an almost perfect correlation among the value buckets and the result is highly significant ($p = <0.001$). The t-statistics are significantly negative for the first two pairs and significantly positive for the third pair. The means seem to change significantly. The statistics of growth, GARP and value described above are summed up in the table 4.16 below.

Growth	Pearson correlation	Significance	t-statistic	P level
1st data set and 2nd	0.981	<0.001	-0.075	0.470
1st data set	0.992	<0.001	0.605	0.273

and 3rd				
2nd data set and 3rd	0.979	<0.001	0.473	0.318
GARP				
1st data set and 2nd	0.990	<0.001	-3.542	<0.001
1st data set and 3rd	0.990	<0.001	-2.674	0.004
2nd data set and 3rd	0.996	<0.001	1.481	0.069
Value				
1st data set and 2nd	0.995	<0.001	-3.494	<0.001
1st data set and 3rd	0.996	<0.001	-2.324	0.010
2nd data set and 3rd	0.996	<0.001	1.687	0.046

Table 4.16: correlation among buckets

In sum, the correlation between the buckets in each test of each variable are nearly perfectly correlated and this correlation is highly significant. However, means have changed in the first two pairs of data sets of GARP and all pairs in value. Normality and randomness of the buckets of data needs to be checked.

4.10.2 F-test for variances

According to the F-test, only with the buckets of GARP and value, where the means have significantly changed according to the t-statistics above, there is no different variance throughout. The buckets with significantly different variance are all in the growth buckets. The mean of the value and GARP buckets do not result in significantly different variance amongst these buckets. Hence, again, the difference between buckets is more or less random and not significant. This can be gauged from table 4.17 below.

	F-statistic	one-tailed p	two-tailed p
Growth			
1st and 2nd data set	1.42	0.000	0.000 -> variances are different
2nd and 3rd data set	1.28	0.008	0.016-> variances are different
1st and 3rd data set	1.12	0.138	0.275-> variances are not different
GARP			
1st and 2nd data set	1.02	0.423	0.846-> variances are not different
2nd and 3rd data set	1.00	0.492	0.983->variances are not different
1st and 3rd data set	1.02	0.415	0.830->variances are not different

Value			
1st and 2nd data set	1.05	0.327	0.654->variances are not different
2nd and 3rd data set	1.04	0.342	0.683->variances are not different
1st and 3rd data set	1.00	0.484	0.968->variances are not different

Table 4.17: F-test for the buckets

As can be seen, only two pairs of the growth data sets, where there is no significant change in means, have change in variance. The GARP and value buckets have no change in variance, while these did have significant change in means.

4.10.3 Testing of covariances

If buckets are to vary, and have significant change in means, there wouldn't be any covariance. If covariances were to be high, then logically there is no change in the buckets. All value buckets have high covariance with all other value buckets as can be found in panel A. Covariance is high for every GARP bucket with every other GARP buckets as can be found in panel B. Covariance of every growth bucket is high for every growth bucket as can be found in panel C of the table below. The entire set of covariance tests can be found in table 4.18 below.

Panel A: value	70th to the 100th	80th to the 100th 3	75th to the 100th
70th to the 100th	21.768	22.155	21.730
80th to the 100th	22.155	22.777	22.217
75th to the 100th	21.730	22.217	21.856

Panel B: GARP	30th to the 70th	40th to the 60th	50th tot the 75th

30th to the 70th	21.768	22.155	21.730
40th to the 60th	22.155	22.777	22.217
50th to the 75th	21.730	22.217	21.856

Panel C: growth	30th	25th	20th
30th	20.229	19.832	19.812
25th	19.832	19.836	19.746
20th	19.812	19.746	19.794

Table 4.18: covariance tests across buckets for each variable

4.10.4 Cointegration test

As can be seen in table 4.19 below, there is significant cointegration between buckets in each variable.

Buckets	p-value
Growth	0.01
GARP	0.01
Value	0.01

Table 4.19: cointegration test

4.10.5 Conclusion

Every bucket in every variable has extremely high covariance. Every bucket of each variable has almost perfect correlation per variable. There is significant change in means for two of the GARP paired t-statistics and all pairs of value statistics. The variances are not significantly different for these variables. The buckets of each variable are significantly cointegrated. It can be concluded that the differences are minor and the buckets are sufficiently similar and not significantly different within each variable.

4.11 Summary of Findings

In the descriptive statistics of the developed market, only growth increased in pêrformance, though only marginally, the remainder all declined in performane. In the first period, value clearly outperforms GARP, which in turn outperformed growth. The old paradigm seems to be confirmed by the descriptive statistics. In the second period, deciding which style outperforms is too close to call, differences are minor. However, the old paradigm still shows vitality, if only minor as value still has a little higher means than GARP, which is followed closely by growth. In the emerging markets, both in the first and the second period, there is a confirmation of the old paradigm in the descriptive statistics. GARP and value have even larger means of performance in emerging markets than in the developed markets, in the descriptive statistics.

With the STL's, all performances in developed markets declined visually, besides growth. In emerging markets, all performances declined. The changes in developed markets such as growth seem immaterial and differences are hard to affirm. It is clear that with emerging markets, there are considerable changes in performance, but with developed markets and even emerging markets, there are inconsistencies and there is no outspoken contrast in the STL's that make it impossible to affirm that there is a stark contrast between the two periods in terms of performance.

The first set of paired t-test outspokely confirm these STL's and the descriptive statistics. Although there are differences, there are no significant changes in the evidence in means from the first to the second period, not in developing nor in emerging markets. The median mood test has resulted in the fact that for all variables in all markets, the median did not show signficant change during both periods. Neither did it go the other direction, because a TOST-test did not imply equivalence neither. Some means do demonstrate varance in an F-test significantly, more specifically the value and the GARP

strategy. The F-test assumes normality. There's less significance in the levene's test where normality is not assumed than in the F-test, meaning that normality is important, and the change from one period to the next is just random. Covariance confirms that performance is not linked, but random. Significant cointegration confirms this normality. The second set of paired t-tests, in the first period, demonstrate that GARP significantly outperforms growth significantly in both developed and emerging markets, although insiginifcant, the medians go in the same direction. Value significantly outperforms GARP in developed markets and insignificantly in emerging markets, whilst the median being higher in both markets, indicating the strength of GARP in the paradigm.

In the second period, in developed markets, GARP does not outperform growth significantly, not in medians as well. In emerging markets GARP outperforms growth significantly. Value outperforms GARP significantly, in terms of means, in emerging markets, but not in terms of medians. It was hypothesized that GARP would outperform both growth and value. There seems to be no evidence of this.

Only in the first hypothesis is the change in variance significant. High covariance, high correlation, few outliers, a uniform distribution lead to reliable data. Variance results in variability, so does high covariance, high correlation as well. There are few outliers because the data is uniformly distributed and this explains why there is high reliability.

The problem of difference of percentiles between the buckets in the data was proved unproblematic for this research. The correlation among the buckets was almost perfect and highly significant for all variables. There was high covariance and significant change in means for two of the GARP paired t-statistics and all pairs of value statistics. The changes in variances are not different and the buckets are significantly cointegrated

The variances are not significantly different for these variables. The buckets of each variable are significantly cointegrated. In sum, the buckets are not significantly different, which removes the final obtacle in terms of results for this study.

4.12 Conclusion

GARP outperforms growth in both developed and emerging markets in terms of means but not in terms of medians which go in the same direction. GARP signficantly underperforms value in terms of means but not in terms of medians. GARP does not significantly underperform value in emerging markets. In other words, the old paradigm can be completed by a GARP strategy that is almost as strong as the value strategy in outperforming growth.

There is no new paradigm. In the second period, GARP does not outperform growth in terms of means nor medians in developed markets. In emerging markets, GARP outperforms growth, significantly, in terms of means, but not in terms of medians. GARP does not significantly outperform value in developed markets, not in medians neither. Value outperforms GARP significantly, in terms of means, in emerging markets, but not in terms of medians. All the medians in the second period point in the same direction as the means. All medians show no significant outperformance. The developed markets have no significant outperformance for any strategy, not in terms of means nor medians, while the emerging market means shows outperformance of value over GARP and growth in terms of means, but not in terms of medians, which nonetheless point in the same direction.

The paradigm has not changed, since in developed markets as the change between the two periods is not found to be significantly altered. This was proven by a battery of tests for improving the reliablity of this study. In emerging markets, there seems to be no

new paradigm, there is some constancy in the outperformance. Value prevails, GARP follows closely, though less closely than in the first period. The STL's confirm these tests. There are no problems with correlation between the data as there is significant, almost perfect correlation between the buckets, this and all the other test that have been executed have made clear that the reliability of the findings of this study has thereby been completely assured.

CHAPTER V:

DISCUSSION

5.1 Discussion of Results

As the investors of Greenwald et al. (2004), whom incorporate growth in their value investing approach, such as Warren Buffet, demonstrate the possibility to incorporate growth in a value approach. And as Lynch and Rothchild called this strategy a GARP strategy, which they then articulate in their books (Lynch and Rothchild, 1994; 2000), and as these investors called superinvestors, including the ones that mix growth with value, all outperform the market (Soloviova, 2020), so does the evidence in the time leading up to the start of the GFC, that is before the 1st of January 2007, illustrate that value investors and GARP investors outperform growth investing by a large margin. As could be expected GARP had a strong presence in outperformance theory, an even larger presence than this research has anticipated for. Hypothesis one and two were proven in developed markets and emerging markets, although GARP is even stronger and more closely performing like value, even stronger than has been anticipated. In emerging markets, the GARP and value, in terms of means, perform even stronger. The B/M metric, of Fama and French (2021) has been widely supported by many authors **(**e.g Pätäri and Leivo, 2017) to demonstrate the outperformance of value over growth. GARP now seems almost as strongly to outperform as value according to this B/M metric. The operationalization of GARP as the 50th to 70th percentile of B/M seems a sound one. The buckets that fluctuate around these threshold have also demonstrated consistency in outperformance around that threshold and have proven to be reliable in determining outperformance. Many authors, such as Fisher (1996), and many practitioners (Greenwald et al., 2004) have hereby been

given empirical evidence, a completion of Fama and French's research, of GARP being an almost equally strong investment strategy as value. Clearly in this framework, the investors that combine growth with value, outperform, thereby they are called value investors by Greenwald et al. (2004). Many of them, for example Buffett and Lynch outperformed the market for decades (Wirawan and Sumirat, 2021). Glamour stocks are supposed to be stocks everyone want to own (Athanassakos,& Ivey, 2009). However, as many have demonstrated, growth comes at a price, hence it must be bought cheap or, in other words, at reasonable prices (Greenwald et al, 2004). It is true what Campbell et al. (2010) demonstrate that there's more to growth than just glamour. This study just illustrates the empirical importance of all of these authors, because GARP has B/M outperformance, the main cause of outperformance since growth does not perform well compared to value, as Fama and French (1998) have demonstrated, but GARP does outperform, which is a combination of the B/M of value and growth, the price being slightly below medium to medium nonetheless, although there were buckets that went above the medium point such as the 30^{th} to the 70^{th} which also showed sings of illustrated outperformance of GARP, e.g. in the descriptive statistics.. Hence this is the right metric to use. Meaning that all the behavioral finance theorist are true, value outperformance is caused by behavioral biases (e.g. Griffin 2015), which is because of low prices (e.g. Greenwald et al., 2004) and there is mean reversal for low prices (Fama and French, 2021). This is the same for GARP, GARP outperforms because of its growth is underrated in terms of B/M as this study clearly demonstrates. Clearly, GARP and value dominate the old paradigm. GARP is almost as strong as value and compared to the outperformance over growth, it can even be termed the GARP premium.

In the second period, something remarkable has happened. According to the emerging markets evidence utilized in this study, the paradigm holds, but according to the developed

markets evidence in this research, no strategy outperforms. That value underperformed growth has been evidenced by many (e.g. Arnott et al., 2021). But that growth performed as bad as value, globally, is something remarkable. However, as discussed in the literature review, there were many studies that were done in the second period that demonstrate the outperformance of value (e.g. Atodaria et al., 2021). This allocated to mixed findings, and a need for a global model. Hence, it is probable that the performance of all strategies is flat in the developed markets. Moreover, there was debate whether value was dead, whether the outperformance of growth over value was an unusual macro environment (Cornell and Damodaran, 2021), whether low-interest rates were to blame (Weis et al., 2021), whether there is more access to data, digitization of the economy, trading facilities that may have changed the rules of the game (Stagnol et al., 2021). There were many possible explanations for the outperformance of growth**.** It turns out that growth does not outperform value or GARP in monthly returns. Nonetheless, monthly returns is exactly how Fama and French (1998) found value to outperform growth for decades..

All the strategies perform worse than in the period before the 1st of January 2007. It was also expected that the second period would be performing better than the first period. It turns out that the second period was worse performing than the first, both in developed and emerging markets. This research clearly has overestimated the performance of the second period. Too much emphasis might have been laid on the leading nation of America that was labeled that way by Dujava and Vojtko (2024). In America, there was an explosion of big tech (Greenwald, et al. 2021). That led to an overemphasis of the outperformance of growth in this research. Arnott et al. (2021) whom demonstrate growth outperformance most thoroughly, only use US stocks and not global stocks. And of course, those US stocks have the main tech indices and tech stocks like big tech in Greenwald et al. (2021). It is there that growth might have outperformed,

but in other markets around the world, this might not have been the case. Actually, it is hard to think of a global paradigm of nations that all have an outperformance of tech. Many traditional stocks are value stocks, based on hard asset such as Greenwald et al. (2020) describes. Big tech outperformed according to Greenwald et al. (2020). Is every company a tech company? Absolutely not! Think of the green energy companies, the soft drink companies, the beer companies, all materials-producing companies, all wheat, grain, flower, fruit companies, all crops, this list goes on and on. This is illustrated by the emerging markets. There, the paradigm is very much alive. Value and GARP outperform growth widely. These countries have taken the role of the old developed nations, where labor has been used to produce goods, because labor in emerging markets is cheap because it is emerging markets are underdeveloped, it cannot move along borders in a global world and money can be made by exporting goods (e.g. Stiglitz, 2003; Greenwald and Kahn, 2008; Stiglitz, 2017). Hence, in this asset rich environment of the emerging markets, where assets still do the job, the old paradigm holds. But still in developed countries, there still must be an enormous number of asset rich companies named above which would need to have become evident in the outperformance of value and growth, since not all companies by far are tech companies. Regional farmers are everywhere, factories, too, not matter what country. The mixing of the two, tech and tangible asset-high companies, however, might have mixed the evidence and has probably resulted in the flat performance of the old paradigm in developed markets.

There are other factors as well (i.e. B/M metric). According to Greenwald et al. (2020), the structure of the companies has changed leading to more tech companies that include high operating leverage and intangibles. This biases the B/M metric, because these all mean less tangible assets and more intangibles. Intangibles are not included in the assets of an annual report (Greenwald et al. 2020). Many have argued intangibles are

crucial today. This was first demonstrated by the research of Baruch Lev (Lev, 2000). Hence B/M might not solve the equation in the second period for developed markets. Hence, that might be the cause, of the flat performance as well. As was argued, the B/M would have to be adapted to include the intangibles, however, adding five or ten percent over an entire universe of stocks would be a zero sum game, hence this could not have been achieved in this study. A new metric would need to be invented to test the outperformance in the second period.

However, out of all of this follows, value and GARP continue to outperform growth in asset rich companies, that are undervalued in terms of assets, or in terms of growth, in both periods, across markets, according to the B/M metric. The old paradigm holds for asset rich markets. GARP does outperform growth almost as well as value, and hence the paradigm might also include GARP outperforming growth, which adds to the Fama and French (2021) value outperforming growth paradigm. Or one could simply complete the old paradigm with value and GARP outperforming growth. The period starting the 1st of January 2007, would only include the value and GARP premium over growth for asset-rich companies by means of the B/M.

In the results section, it became clear that over the two periods returns do not differ. This must have implications for the paradigm. The doomsday scenarios of the death of value and the doubt of the value approach, that its profitability is gone, are wrong, value is still alive and kicking, as it always has, as also is shown here in the emerging markets. It only needs hard assets. This must mean the old paradigm still rules the market, but only for asset rich companies. There is no evidence of growth outperforming and value underperforming at all, not even in the developed markets. The descriptive statistics, the visual evidence of STL's that indicated there is no significant change between the two periods, the corresponding paired t-tests, and all other test

indicate that the performance of stocks as a whole has not endured an extreme global change in the first period to the next. The correlation analysis and all tests needed to ensure and were intended to increase reliability, of the change of the second period compared to the first, all point in the same direction. All the other test surrounding buckets, and the other tests surrounding the outperformance, all also increase reliability. Value and GARP outperform growth in all asset-based companies. Overall, in the first period and only for asset-based companies in the second period that were primarily found in the emerging markets.

5.2 Discussion of Research Question One

According to research question one, the old paradigm must be completed. The old paradigm seems to be two-sided. It can be completed in one paradigm, with GARP included as almost as strong as value. Or an entirely new paradigm can be made by splitting up the paradigms into the value outperforming growth paradigm and the GARP outperforming growth paradigm. The old paradigm seemed correct. It, however, must be completed. Value outperforms growth, GARP outperforms growth, GARP is almost as strong as value in outperforming growth. The old paradigm can be completed now. Value is on top in the paradigm, with a close and strong second place for GARP. A second, two-sided paradigm can also be created with value and GARP outperforming growth. All methods used in this research point in this direction and demonstrate high reliability.

5.3 Discussion of Research Question Two

The old paradigm still holds but creating a new paradigm is slightly more difficult. GARP and value only seem to outperform in asset-rich markets such as the emerging markets. In developed markets, the performance of all strategies is flat. Undoubtedly this

comes from the mixing of tech and asset-rich companies that are present on the market today. And also this comes from the related reason, the intangible-high state of tech companies that lead to an imperfection of the B/M metric, because intangibles aren't included in the annual report. This results in the B:M not being able to distinguish outpeformance for value and GARP over growth in tech stocks. This can be seen in emerging markets where there are many more asset-based companies. There, value and GARP still outperform growth tremendously. Hence, the new paradigm could be labeled the same as the old paradigm. However, in the new paradigm, value and GARP outperform only in tangible asset-based companies. Hence, that is the new paradigm. The paradigm of outperformance theory of GARP and value outperforming in the asset-based industries, according to the B/M metric, that Fama and French (2021) and a legion of researcher over many decades have supported, throughout a large period of time in industrial history. All other tests performed in this research point in the same direction and have important backing and reliability for these findings.

CHAPTER VI:

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

6.1 Summary

The objective of this study was to understand how GARP performed relative to value and growth before the beginning of 2007 and complete that old paradigm. Second, it was the objective to understand the performance of GARP, starting in the beginning of 2007, and delineate a new paradigm based on changes in the financial markets. It is clear in theory and practice that value outperformed growth in most of the recent 20th century and the beginning of the 21st century history (Fama and French, 1998). GARP is an important investment strategy and has been practiced by Buffett and Lynch, it also is the combination of value and growth (Lynch and Rothchild, 1994; 2000). It was not clear how GARP performs relative to these two strategies. The literature regarding the time periods of the two suspected GARP-included paradigms, have indicated that times might have changed and that GARP might outperform every strategy since the GFC. This seems to be half true. A battery of statistical tests have been used to complete the hypotheses related to these two paradigms.

The most important test is the testing of the outperformance of the means of the variables. Most of the tests were parametric, and all but the testing of the means, were used to indicate reliability. Several tests were used to illustrate the distribution of the test results around the means of outperformance. Variance, covariance, cointegration tests, were used, testing of the normal distribution, skewness, kurtosis were all conducted. Medians were tested. It was expected that the second period differed from the first period as discussed above. This was tested. First period data on each variable was compared to

second period data. In the STL's, there were found small variations between the periods, but not explicitly visually obvious. It was found that these do not differ significantly by means of paired-tests between the variables across the two time periods, but were not equivalent by means of a TOST-test nonetheless. Compared to the first period, the second period is a normal period, or a normal stock market episode, and the results were quite random.

Finally it was tested whether the differing buckets used in the tests were similar enough to be realiable. That was found to be the case by high correlations, little significant changes in variance, and high and similar covariances throughout. This all led to assuming the hypotheses were answered well-founded and reliably.

Since GARP outperforms growth widely, it forms a new relationship on its own, which is the GARP premium over growth. It also outperformed growth about as much as value. The old paradigm has been completed. It is clear how GARP performed: value outperforms, GARP outperforms growth as well, almost as much as value. Thereby the old paradigm has not only been completed but also enhanced, given that GARP outperforms growth, and so does value, but also that there is a GARP premium over growth.

With regards to the new paradigm with which the assumption is that there are changes in the market, it was clear in the literature review that there is debate going on whether value was dead, whether this was an unusual macro environment (Cornell and Damodaran, 2021), whether low-interest rates were to blame (Weis et al., 2021). Other causes would be more access to data, digitization of the economy, trading facilities that may have changed the rules of the game (Stagnol et al., 2021). There were many possible explanations for the outperformance of growth. It turns out that growth did not outperform at all. In developed markets, all performance was flat, all strategies performed

almost equally bad. It turns out that in emerging markets, the outperformance is still there. What might cause this superior showing? Hard-asset companies are more to be found in emerging markets. These outperform hard-asset companies of the developed markets because these have cheaper labor in a globalized world (e.g. Stiglitz, 2003; Greenwald an Kahn, 2008; Stiglitz, 2017). Another factor might be the intangibles. These are not included in the annual reports of businesses (Greenwald et al., 2020). And it is hard to put intangibles of individual companies in a portfolio of an entire market. In sum, GARP and value outperform growth in tangible asset-heavy companies around the world. The second paradigm is thereby complete. GARP and value remain on top, but for the second period only for tangible asset-heavy companies such as in the emerging markets. For tech stocks, a new method must be found for the B/M metric for measuring outperformance. The results then also becomes, yes there is tech outperformance, yes GARP is an outperformance strategy, but based on B/M, in empirical setting, GARP only works in asset-heavy companies that are not always found in developed markets.

Because the situation is not significantly different in the second period than it was in the first period, and the emerging markets still demonstrate outperformance for the old paradigm, it can be concluded that, largely, the old paradigm is still functional and still is vital, that value still prevails, GARP follows closely and growth follows distantly. However, GARP seems to be a little bit less strong, as can be found in the emerging markets figures. There is no new paradigm, the old one remains, but only for tangible asset-heavy businesses that are most often found in emerging markets. That is the new paradigm and the new paradigm is thereby achieved, and all objectives of this study are thereby met.

6.2 Managerial Implications

Since GARP performs similar to value, GARP is an important investment strategy, given the historical outperformance of it over growth between 1990 and 2007. Since 2007 until 2023, however, there are more tech stocks in the market, these seem to cause the flat performance of value, growth and GARP since 2007. Intangibles are crucial with tech stocks as well as operating leverage (Greenwald et al., 2020). These all are not included in the B/M metric used to base outperformance theory upon. Therefore, the performance is flat. However, the tangible asset-rich stocks, such as those in the emerging markets should still be available. Therefore, the main implication of this study is that only tangible asset rich companies should be selected. What is available is an historic enormous literature backing and great investors' performance in the value and the GARP style (e.g. Wirawan and Sumirat, 2021, Greenwald et al., 2020; Buffett, 1984). The most fertile fields to find these companies are the emerging markets, where these still outperform growth widely, across the economy, this is not surprising since that is where the tangible asset-heavy industrial companies are to be found as these are export-heavy (Stiglitz, 2003; Greenwald an Kahn, 2008; Stiglitz, 2017).

It is advised for investors to focus more on GARP and value. Value investors don't need to forget traditional value as value would still probably will do just fine, in particular in emerging markets. However, investors should wait for what happens in developed markets. It is too risky to invest without statistical backing (e.g. Graham et al., 2008). As of now, performance across strategies is flat. The best advice would be to wait for new insights in developed markets and confirm, that value and GARP do still outperform. Investors would do fine in learning value investing and growth investing and combining the two into GARP. Security analysts, on the other hand, already have

measures already to buy cheap growth (which is similar to GARP) in their valuations as they forecast and buy projected growth at low prices (Graham et al., 1988).

There are three other important implications of this study: Firstly, value and GARP outperform, it is still possible to profit from value alone. Second, value investors should keep learning value but stick to learning value for tangible asset-heavy companies and forget the tech stocks. GARP investors should specialize their learning on learning value investing and growth investing and learning how to combine them. The research must be done with tangible asset-rich companies or industrial companies. Third, GARP and value investors, should focus on emerging markets and should tocus on buying undervalued (GARP and value stocks) in emerging markets and profit there, as has been also profitable for the last decades!

For GARP investors, both value and growth seem important as Greenwald et al. (2004; 2020) seem to distinguish the Buffett-like investors as growth-oriented value investor instead of making the distinction between value and growth. However, as is noticed in this study and following Campbell et al. (2010), glamour is not the same as growth, there's more to growth than glamour. There's a price on growth, do not overpay as Greenwald et al. (2004; 2020) attest. Hence, paying a reasonable price really is important (also e.g. Fisher, 1996; Lynch and Rothchild, 1994; Lynch and Rothchild, 2000).

For the foreseeable future there will probably always remain emerging markets that produce goods by low-cost labor, that's where the growth is at, that's where the growth companies with the most profits are, tangible asset heavy, where the value and GARP approach can be relied upon, in the emerging markets! That is where most money can be made with an almost a century-wide backed investment strategy! Hence, industrial firms can still be relied upon and have just moved to emerging markets, where again

profits can be made by those investors who have recognized this fact. This would repeat the industrial age for the emerging markets over again.

Traditional tangible assets are disappearing in the tech industries of the developed world, tech industries become ever more present in these markets (Greenwald et al., 2020). It turns out that Greenwald is completely right on that. Only in the emerging markets does the old B/M metric (and GARP's place in it) still work economy-wide. In developed markets, the influence of the intangibles is clearly visible in the performance of value and GARP versus growth by means of the B/M metric. The influence of the hard-assets to outperformance in the B/M metric has been diminished in the developed markets by the influence of the operating leverage and the intangibles on companies that according to Greenwald et al., (2020) are becoming a larger fraction of the economy. However, traditional asset based companies have not performed well in this environment, according to Greenwald et al. (2020). Whether it ever will be possible to invest in hard-asset based companies profitable in developed markets, remains to be seen. In the meanwhile, the emerging markets' doors are wide open.

6.3 Recommendations for Future Research

The outperformance of GARP only works for tangible asset-heavy companies such as those in the emerging markets. It becomes necessary to dig further in this important outcome of this study and detail the tangible asset-heavy performance and chances and opportunities in the emerging markets. As has been discussed, value and GARP outperform growth in the emerging markets. Since the main goal of investors is to make attractive returns, questions emerge: Is there more evidence to get industrial-era like returns for GARP and value.in emerging markets? Does the situation remain flat for all strategies flat in developed markets? Does the B/M still work for tangible asset-heavy

companies in developed markets? The latter looks to be affirmative in the results of this study.

Many, such as Arnott et al., (2021), have found that growth outperformed value, the evidence in this study does not suggest that. The outcome of this flat performance should be further studied. Why is it that growth was found to be outperforming while this research demonstrates a different statistical outcome? Is the entire situation of authors suggesting the day of doom just a behavioral bias? It cannot be that even the brightest minds and supporters of value investing such as Greenwald et al. (2020), are completely biased by an underperformance of traditional value that will remain in the future. It becomes necessary to study the tangible asset-heavy asset valuations in emerging countries such as some in South-East Asia or emerging markets Africa to test whether or not these hard-assets still outperform in more detail and whether they outperform case-per-case as Greenwald et al. (2020) have done for American markets. And also the non-tech stocks of America should be compared with the tech stocks for asset-value performance across larger portfolios, across industries, in more detail and also it must be regarded as to how much these non-tech stocks account for the flat performance, as well as how much the non-tech stocks account for the flat performance.

Therefore, a metric of some sort should be invented to include intangibles or otherwise include the influence of intangibles on the B/M metric, to study the GARP tech stocks B/M wise, because B/M is not a good yardstick. For example, intangibles were not included in the B/M metric, it would be advisable to include them somehow in B/M, however, intangibles are hard to include in B/M over a whole population of stocks, one would still need to increase the whole population with 5% or 10%, which in essence is a zero sum game.

It would be advisable to test other metrics such as E/P, CF/P, D/P (e.g Pätäri and Leivo, 2017), and thereby generalize the findings of this study for the B/M metric. It could be that the E/P will shed more light into the matter since B/M is only based on assets while E/P includes earnings. Earnings are crucial for growth, however, operating leverage is more prevalent today (e.g. Greenwald et al., 2020), this might dilute the findings of that metric as well. CF/P might be the solution. An explanation for the flat performance of all three strategies in the second period is also needed.

Explanations of the difference between emerging and developed market in the second period might also be useful. A global model has been achieved in this research, although indirect, given that GARP and value did not outperform in developed markets and thereby value and growth outperformance could not be found, no significant change has occurred from the first period to the next, and emerging markets did show outperformance, but there are areas that deserve merit to further research the difference between emerging and developing markets in performance, such as comparative performance, what macro-economic conditions the difference, do interest rates cause the difference? Was the stock market performance in emerging, substantially better or substantially worse than developed markets? Research questions such as these can be posed. It also is not clear what happened between the end of the second period and today. This is unknown. Did the situation remain as it was or did it change?

An important recommendation that can be given is to find a tech outperformance paradigm, based on another metric than B/M, as follows from this thesis, B/M is not a good yardstick for tech outperformance, it does not do the trick anymore. As has been stated, intangibles have become crucial (e.g. Lev, 2000). GARP stocks might still outperform growth by some other economy-wide measure than B/M, related to tech assets. Then, a tech value premium can be tested and proven. If one wants to include

GARP in this paradigm, that yardstick for measuring value should be useable for measuring GARP economy-wide as well.

A rewarding avenue for learning more about the outperformance, is to divide for these purposes, the most important branches of the economy into sectors. High-tech and tangible asset based companies can be placed in one sector each and then compare the performance of GARP, value and growth by B/M metrics. This might result in a generalization of the evidence given by this research regarding the division between tech-based and tangible asset-based performance. This might lead to evidence suggesting, as has been suggested in this study, that only tangible-asset companies can be relied upon by the B/M metric, for outperformance of GARP and value. This might generalize the finding that emerging markets are crucial for investing in, by means of the B/M metric, while in developing markets there also might or might not be a role for tangible-asset companies for the B/M metric in contradiction to what Greenwald et al., (2020) seem to argue. That might mean traditional value is not dead, and it still outperforms, in general, for tangible asset-based companies, hence not only in emerging markets as in this research the performance of all strategies is flat and it is not known what influence the tangible-asset companies still have in economies where tech thrives, besides for the emerging markets, where value and GARP thrive. This means studying this matter must again distinguish between developed and emerging markets, for generalizing the evidence found in this thesis even further.

6.4 Contribution to theory and practice

Previous research has found that there is one paradigm that is based on value outperforming growth. Decades have passed with testing only these two variables over and over again. No one has found a third variable in this context. There was no mention

of a third strategy that was almost equally important as value. This research adds this third strategy to the paradigm, GARP. In the old paradigm, value fulfils the role of outperforming growth significantly. Throughout literature, there is no GARP-strategy included in this paradigm. It has been largely neglected although it was hiding in plain sight. In this research, GARP significantly outperforms growth both in developed and emerging markets, matching closely to value in that outperformance, before the start of the GFC. This was extensively proven by a battery of tests. Therefore, in this old paradigm, GARP is contributed to this body of literature. This is a very important contribution. In this paradigm, GARP can be contributed in two ways. GARP can be seen as the GARP-premium over growth, or GARP can be seen as outperforming the growth strategy almost as much in the value outperforming growth paradigm. This results in a new paradigm, the GARP premium over growth, and a completion of the old paradigm: value and GARP outperform growth.

Since the GFC started, there was flat performance of all strategies. However, in emerging markets the contours of value and GARP outperforming were still visible. It turns out that value and GARP outperform in terms of B/M in tangible asset-heavy economies, such as the emerging markets. The paradigm still holds, but the new tech firms and their intangibles dilute the performance of B/M in developed markets. The paradigm started by Fama and French, thereby becomes a tangible asset-heavy only paradigm. It turns out that another contribution is that B/M, for value and GARP, does not seem to explain the outperformance of tech companies anymore, and adding intangibles to a universe of stocks is a zero-sum game. Therefore a new metric must be found. The unrealistic B/M metric in outperformance of the tech part of the economy is thereby a contribution. Nonetheless, an important contribution as well is that if you want decades long of empirical and practical backing, value and GARP investing should be

done in tangible asset-heavy companies, in particular those in the emerging markets. That in itself is an important feature of the paradigm as it stands today. This leads to the definition of the paradigm as it is today. GARP has a premium over growth while GARP and value are close but both have a premium over growth. In these paradigms GARP and value outperform according to B/M, but only in tangible asset-heavy industrial or production-type companies. That is the definition of the paradigm and that is the most important contribution of this study.

The final contribution arises from surprising findings, in the literature review it became clear that many researchers, including the most famous ones, doubted the performance of value. The main contribution for investor practice by means of this research is that value investors, in practice, do not need to worry about underperforming indefinitely, and for the time being, can focus on selecting value and GARP stocks, in emerging markets, in particular. All the rumors, all the doubt regarding growth now outperforming value with value being dead, also did not appear to be correct. Value investors have always refused to disbelieve the value approach (e.g. Greenwald et al., 2004). It turns out they are correct once more. However, tangible asset based stocks, which are abundant in emerging market might be their refuge if they still want to invest like in the old Graham days, where you could get high performing companies like material companies and railroads for low prices similar to Graham et al. (2008) in their days.

Growth did not significantly outperform. In emerging markets, value and GARP did outperform. The rumors are buried in the rise of tech stocks and the lack of outperformance with regards to the traditional B/M metric for these tech stocks. In other words, tech is making obsolete the traditional B/M paradigm for tech stocks that was discovered by Fama and French (2021). That was completed by means of the (completion

of) the paradigms as was contributed above, and the outperformance has shifted to emerging markets where B/M is still crucial.

REFERENCES

Agrawal, P. and Nigro, M. (2020). "The recent decade of drawdown in value: a diagnosis and an enhancement", *Two Sigma, White Paper.* Available from *https://www.twosigma.com/wp-content/uploads/A-Diagnosis-and-an-Enhancement-3.pdf* [Accessed 22 May 2024].

Agrawal, S. and Das, M.L. (2011). "Internet of Things: A paradigm shift of future Internet applications", *2011 Nirma University International Conference on Engineering,* pp. 1-7. Available from https://www.semanticscholar.org/paper/Internet-of-Things-%E2%80%94-A-paradigm-shift-of-future-Agrawal-Das/411eedf2faec7b41db87ac86babf254063ba0b1f [Accessed 18 September 2024].

Aharon, D.Y. (2021). "Uncertainty, fear and herding behavior: Evidence from size-ranked portfolios", *Journal of Behavioral Finance,* Vol. 22 No. 3, pp. 320–337.

Ahmed, P. and Nanda, S. (2000). "Style investing: Incorporating growth characteristics in value stocks", *SSRN Electronic Journal,* No. 243524. Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=243524 [Accessed 18 September 2024].

Ali, A. and Mahendra, A. (2020), "Factor premiums: Evidence from the Indian equity market", *Finance India,* Vol. 34 No. 4, pp. 1539–1562.

Am, B. P. (2020). *Analisis perbandingan kinerja portofolio garp (growth at a reasonable price) stocks dan value stocks dengan ihsg di bursa efek indonesia.* Doctoral dissertation, Universitas Gadjah Mada. Available from https://etd.repository.ugm.ac.id/penelitian/detail/187632 [Accessed 22 May 2024].

An, C., Cheh, J.J., Kim, I. (2017), "Do value stocks outperform growth stocks in the US Stock market?", *Journal of Applied Finance and Banking,* Vol. 7 No. 2, pp. 99-112.

Anderson, K., and Zastawniak, T. (2017), "Glamour, value and anchoring on the changing P/E", *The European Journal of Finance,* Vol. 23 No. 5, pp. 375-406.

Andersson, L. and Holmgren, D. (2022). *Does a portfolio of growth stocks outperform a portfolio of value stocks?: Evidence from Sweden and Norway.* Degree project, Umeä

School of Business, Economics and Statistics. Available from https://www.diva-portal.org/smash/get/diva2:1673953/FULLTEXT01.pdf [Accessed 22 May 2024].

Ang, R., and Chng, V. (2013). *Value investing in growth companies: how to spot high growth businesses and generate 40% to 400% investment returns.* Hoboken, NJ: Wiley.

Anginer, D., Fisher, K. L., Statman, M. (2007), "Stocks of admired companies and despised ones", *SSRN Electronic Journal,* No. 962168. Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=962168 [Accessed 18 September 2024]

Arnott, R.D., Harvey, C.R., Kalesnik, V., Linnainmaa, J.T. (2021), "Reports of value's death may be greatly exaggerated", *Financial Analysts Journal,* Vol. 77 No. 1, pp. 44–67.

Athanassakos, G. (2009), "Value versus growth stock returns and the value premium: The Canadian experience 1985–2005", *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration,* Vol. 26 No. 2, pp. 109–121.

Athanassakos, G., and Ivey, R. (2009), "Value vs Glamour stock returns and the value premium: The Canadian experience 1985-2002", *Canadian Journal of Administrative Sciences.* Available from *https://www.fep.up.pt/conferencias/pfn2006/Conference%20Papers/425.pdf* [accessed 22 May 2024).

Atodaria, Z., Shah, D., Nandaniya, J. (2021), "An Empirical investigation of the CAPM and the Fama–French three factor model in Indian stock market", *International Journal of All Research Education and Scientific Methods (IJARESM),* Vol. 9 No. 5, pp. 1454–1459.

Bauman, W.S., Conover, C.M., Miller, R.E. (1998), "Growth versus value and large-cap versus small-cap stocks in international markets", *Financial Analysts Journal*, Vol. 54 No. 2, pp. 75–89.

Beneda, N. (2003), "Growth Stocks Outperform Value Stocks Over Long Term", *Academy of Accounting and Financial Studies Journal*, Vol. 7 No. 2, pp. 79–84.

Bevanda, L.-M., Zaimović, A., Arnaut–Berilo, A. (2021), "Performance of value and growth stocks in the aftermath of the global financial crisis", *Business Systems Research: International Journal of the Society for Advancing Innovation and Research in Economy*, Vol. 12 No. 2, pp. 268–283.

Birch, K. and Bronson, K. (2022), "Big tech", *Science as Culture*, Vol. 31 No. 1, pp. 1-14.

Blank, S. (2024), "The "big tech" economy", *Harvard Model Congress*. Available from https://static1.squarespace.com/static/5cb7e5637d0c9145fa68863e/t/6549 7e44afd27f120697167e/1699315268595/HMC2024_SP_G-20_2.pdf [Accessed 22 May 2024].

Blitz, D. (2021a), "The quant crisis of 2018–2020: cornered by big growth", *The Journal of Portfolio Management*, Vol. 47 No. 2, pp. 1-14.

Blitz, D. (2021b), "The quant cycle", *SSRN Electronic Journal*, No. 3930006. Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3930006 [Accessed 18 September 2024].

Blitz, D. (2023), "Factor investing: the best is yet to come", *The Journal of Portfolio Management*, Vol. 49 No. 2, pp. 10–18.

Blitz, D. and Hanauer, M.X. (2020), "Resurrecting the value premium", *The Journal of Portfolio Management*, Vol. 47 No. 2, 63–81.

Bond, C.C. (2019). *T. Rowe Price: The man, the company, and the investment philosophy*. Hoboken, NJ: Wiley.

Bongini, P., Cucinelli, D., Di Battista, M.L., Nieri, L. (2019), "Profitability shocks and recovery in time of crisis evidence from European banks", *Finance Research Letters*, Vol. 30 September 2019, pp. 233–239.

Bourguignon, F. and De Jong, M. (2003), "Value versus growth", *Journal of Portfolio Management*, Vol. 29 No. 4, pp. 71–79.

Buffett, M., and Clark, D. (2006). *The Tao of Warren Buffett: Warren Buffett's words of wisdom: Quotations and interpretations to help guide you to billionaire wealth and enlightened business management (Vol. 1).* New York: Simon and Schuster.

Buffett, W. E. (1984), "The superinvestors of Graham-and-Doddsville", *Reprinted from Hermes*. Available from https://www.safalniveshak.com/wp-content/uploads/2011/10/The-Superinvestors-of-Graham-and-Doddsville-by-Warren-Buffett.pdf [accessed 22 May 2024].

Campbell, J.Y. (2014), "Empirical asset pricing: Eugene Fama, Lars Peter Hansen, and Robert Shiller", *Scandinavian Journal of Economics*, Vol. 116 No. 3, pp. 593-634. Available from https://doi.org/10.1111/sjoe.12070 [Accessed 14 March 2024].

Campbell, J. Y., Polk, C., Vuolteenaho, T. (2003), "Growth or glamour". *Unpublished paper, Harvard University and Northwestern University.* Available from https://conference.nber.org/confer/2003/bff03/polk.pdf [Accessed 22 May 2024].

Campbell, J. Y., Polk, C., Vuolteenaho, T. (2010), "Growth or glamour? Fundamentals and systematic risk in stock returns", *The Review of Financial Studies*, Vol. 23 No. 1, pp. 305-344.

Cantwell, J. and Hayashi, T. (2019). *Paradigm shift in technologies and innovation systems.* New York: Springer.

Chahine, S. (2009), "Value versus growth stocks and earnings growth in style investing strategies in Euro-markets", *Journal of Asset Management*, Vol. 9 No. 5, pp. 347–358. https://doi.org/10.1057/jam.2008.31

Chancharat, N. and Sinlapates, P. (2021), "Is value premium driven by risk in the stock exchange of Thailand? A comparison of the Fama/French three-factor model and Fama/French five-factor model", *International Journal of Monetary Economics and Finance*, Vol. 14 No.4, pp. 314–322.

Chan, K. C. (1988), "On the contrarian investment strategy", *Journal of Business*, Vol. 61 No. 2, pp. 147-163.

Chan, L.K.C. and Lakonishok, J. (2004), "Value and growth investing: Review and update", *Financial Analysts Journal*, Vol. 60 No. 1, pp. 71–86.

Chen, Z., Ibbotson, R. G., Hu, W. (2010), "Liquidity as an investment style", *SSRN Electronic Journal*, No. 1675108. Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1675108 [Accessed 18 September 2024].

Chiah, M., Chai, D., Zhong, A., & Li, S. (2016), "A better model? An empirical investigation of the Fama–French five-factor model in Australia", *International Review of Finance*, Vol. 16 No. 4, pp. 595-638.

Cingari, P. (2024), "US stock markets at record highs: Overvalued territory or still a value buy?", *Nasdaq*, 22 January. Available from https://www.nasdaq.com/articles/us-stock-market-at-record-highs:-overvalued-territory-or-still-a-value-buy [Accessed 21 May 2024].

Cohen, R. B., Polk, C., Vuolteenaho, T. (2003), "The value spread", *The Journal of Finance*, Vol. 58 No. 2, pp. 609-641.

Cliffe, S. (2011), "When your business model is in trouble", *Harvard Business Review*. January-February 2011. Available from https://hbr.org/2011/01/when-your-business-model-is-in-trouble [Accessed 23 May 2024].

Cornell, B. and Damodaran, A. (2021), "Value investing: requiem, rebirth or reincarnation?", *NYU Stern School of Business Forthcoming*. Available from https://deliverypdf.ssrn.com/delivery.php?ID=680074082121115029000082017118084113005035046078090017099118004064087094108115031077114007007115059023062064030089124070025092121012037073045074100075075120109029093005022102022094015106064090087114025011064010070098031112116021125100083126009088&EXT=pdf&INDEX=TRUE [Accessed 23 May 2024].

Crawford, D., Crupi, M., Vijayaraghavan, R., Johnson, C. (2020), "Disruption, not regulation, should be tech companies' top concern", *Harvard Business Review*. Available from https://hbr.org/2020/12/disruption-not-regulation-should-be-tech-companies-top-concern [Accessed 23 May 2024].

Cussen, M.P. (2023), "Value or growth stocks: which is better", *Investopedia*, 27 July. Available from https://www.investopedia.com/articles/professionals/072415/value-or-growth-stocks-which-best.asp#:~:text=For%20example%2C%20value%20stocks%20tend,seeking%20to%20time%20the%20markets. [Accessed 18 May 2024].

Damodaran, A. (2012), "Growth Investing: Betting on the future?", *SSRN Electronic Journal*, No. 2118966. Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2118966 [Accessed 18 September 2024].

Damodaran, A. (2012), "Value investing: investing for grown ups?", *SSRN Electronic Journal No.* 2042657. Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2042657 [Accessed 18 September 2024].

Dan Perbankan, J. K. (2021), "The effect of firm profitability on expected stock return in ASEAN stock market", *Jurnal Keuangan Dan Perbankan*, Vol. 25 No. 3, pp. 642-655.

Das, P. & Rao, S.P. (2011), "Value premiums and the January effect: International evidence", *The International Journal of Business and Finance Research*, Vol. 5 No. 4, pp. 1–15.

De Bondt, W.F.M. and Thaler, R. (1985), "Does the stock market overreact?", *The Journal of Finance*, Vol. 40 No. 3, pp. 793–805.

De Bondt, W.F.M. and Thaler, R.H. (1987), "Further evidence on investor overreaction and stock market seasonality", *The Journal of Finance*, Vol. 42 No. 3, pp. 557–581.

Dimson, E., Nagel, S., Quigley, G. (2003), "Capturing the value premium in the United Kingdom", *Financial Analysts Journal*, Vol. 59 No. 6, pp. 35–45.

Domingues, C. H. S., Aronne, A., Pereira, F., Magalhães, F. (2022), "Piotroski, Graham and Greenblatt: an empirical approach to value investing in the Brazilian stock market", *Brazilian Business Review*, Vol. 19 No. 5, pp. 475-491.

Doroghazi, R. M. (2022), "Quotes from Warren Buffett: Part II of II", *The American Journal of Cardiology*, Vol. 164 February 2022, pp. 131-132.

Drew, M. (2003), "Beta, firm size, book-to-market equity, and stock returns", *Journal of the Asia Pacific Economy*, Vol. 8 No. 3, pp. 354–379.

Dujava, C., and Vojtko, R. (2024), "Why do US stocks outperform EM and EAFE Regions?", *SSRN Electronic Journal*, No. 4694624. Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4694624 [Accessed 18 September 2024].

Duong, C., Pescetto, G., Santamaria, D. (2014), "How value–glamour investors use financial information: UK evidence of investors' confirmation bias", *The European Journal of Finance*, Vol. 20 No. 6, pp. 524-549.

Durand, R. B., Lim, D., Zumwalt, J. K. (2011), "Fear and the Fama-French factors", *Financial Management*, Vol. 40 No. 2, pp. 409-426.

Ekawati, E. (2012), "The link of abnormal accrual mispricing and value-glamour stock anomaly: Evidence from the Indonesian capital market", *Gadjah Mada International Journal of Business*, Vol. 14 No. 1, pp. 77-96.

Eisfeldt, A.L., Kim, E., Papanikolaou, D. (2020), "Intangible value", *National Bureau of Economic Research.* Available from https://www.nber.org/system/files/working_papers/w28056/w28056.pdf [Accessed 23 May 2024).

Elgammal, M.M. and McMillan, D.G. (2014), "Value premium and default risk", *Journal of Asset Management*, Vol. 15 No. 1, pp. 48–61.

Everts, M. (2006), "Duration of business cycles", *Munich Personal RePEc Archive.* Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=905804 [Accessed 15 April 2024].

Fabozzi, F.A. and Nazemi, A. (2023), "News-based sentiment and the value premium", *Journal of International Money and Finance*, Vol. 136 September 2023, No. 102864.

Fama, E. F. (1965), "The Behavior of Stock-Market Prices", *The Journal of Business*, Vol. 38 No. 1, pp. 34-105.

Fama, E.F. and French, K.R. (1995), "Size and book-to-market factors in earnings and returns", *The Journal of Finance*, Vol. 50 No. 1, pp. 131-155.

Fama, E. F. and French, K. R. (1996a), "The CAPM is wanted, dead or alive", *The Journal of Finance*, Vol. 51 No. 5, pp. 1947-1958.

Fama, E.F. and French, K.R. (1996b), "Multifactor explanations of asset pricing anomalies", *The Journal of Finance*, Vol. 51 No. 1, pp. 55–84.

Fama, E.F. and French, K.R. (1998), "Value versus growth: The international evidence", *The Journal of Finance*, Vol. 53 No. 6, pp. 1975–1999.

Fama, E.F. and French, K.R. (2000), "Forecasting profitability and earnings", *The Journal of Business*, Vol. 73 No. 2, pp. 161–175.

Fama, E.F. and French, K.R. (2004), "The capital asset pricing model: Theory and evidence", *Journal of Economic Perspectives*, Vol. 18 No. 3, pp. 25–46.

Fama, E.F. and French, K.R. (2006), "The value premium and the CAPM", *Journal of Finance*, Vol. 61 No. 5, pp. 2163–2185.

Fama, E.F. and French, K.R. (2007), "The anatomy of value and growth stock returns", *Financial Analysts Journal*, Vol. 63 No. 6, pp. 44–54.

Fama, E.F. and French, K.R. (2013), "A four-factor model for the size, value, and profitability patterns in stock returns", *SSRN Electronic Journal*, Vol. 16 No. 3, pp. 1–52.

Fama, E.F. and French, K.R. (2015), "A five-factor asset pricing model", *Journal of Financial Economics*, Vol. 116 No. 1, pp. 1–22.

Fama, E.F. and French, K.R. (2021), "The value premium", *The Review of Asset Pricing Studies*, Vol. 11 No. 1, pp. 105–121.

Fernandez, P. (2015), "CAPM: an absurd model", *Business Valuation Review*, Vol. 34 No. 1, pp. 4-23.

Fisher, K. (2007). *Super stocks*. New York: McGraw-Hill Companies, Inc.

Fisher, P.A. (1996). *Common stocks and uncommon profits and other writings*, Hoboken, NJ: Wiley Investment Classics.

Fisher, P.A. and Fisher, K.L. (2007). *Paths to wealth through common stocks*, Hoboken, NJ: Wiley Investment Classics.

Forero, D., & Tena-Junguito, A. (2024), "Industrialization as an engine of growth in Latin America throughout a century 1913–2013", *Structural Change and Economic Dynamics*, Vol. 68, pp. 98-115.

French, K.R. (2024), "Developed markets factors and returns", *The Kenneth R. French Data Library*. Available from https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#Developed [Accessed 26 March 2023].

Ho, A. D., and Yu, C. C. (2015), "Descriptive statistics for modern test score distributions: Skewness, kurtosis, discreteness, and ceiling effects", *Educational and Psychological Measurement*, Vol. 75 No. 3, pp. 365-388.

Gagliolo, F. and Cardullo, G. (2020), "Value stocks and growth stocks: A study of the Italian market", *International Journal of Economics and Financial Issues*, Vol. 10 No. 3, pp. 7.

Garcia, M.T.M. and Oliveira, R.A.A. (2018), "Value versus growth in PIIGS stock markets", *Journal of Economic Studies*, Vol. 45 No. 5, pp. 956–978.

García-Feijóo, L. and Jorgensen, R.D. (2010), "Can operating leverage be the cause of the value premium?", *Financial Management*, Vol. 39 No. 3, pp. 1127–1154.

Glück, M., Hübel, B., & Scholz, H. (2021), Currency conversion of Fama–French factors: How and why", *Journal of Portfolio Management*, Vol. 47 No. 2, pp. 157-175.

Gonenc, H. and Karan, M.B. (2003), "Do value stocks earn higher returns than growth stocks in an emerging market? Evidence from the Istanbul stock exchange", *Journal of International Financial Management & Accounting*, Vol. 14 No. 1, pp. 1–25.

Google Scholar (2024), *Value versus growth: the international evidence*. Available from https://scholar.google.be/scholar?hl=nl&as_sdt=0%2C5&q=fama+and+french+value+versus+growth+1998&btnG=&oq=fama+and+french+value+versus+ [Accessed 27 August 2024].

Graham, B. (2005). *The intelligent investor: The classic text on value investing.* New York: HarperCollins.

Graham, B., Cottle, S., Dodd, D.L.F., Murray, R.F., Block, F.E. (1988). *Security analysis: Fifth edition,* New York: McGraw-Hill Education.

Graham, B., Klarman, S. Dodd, D. (2008). *Security Analysis: Sixth edition, foreword by Warren Buffett,* New York: McGraw-Hill Education.

Graham, B. and Dodd, D.L.F. (1934). *Security analysis: The classic 1934 edition*. New York: McGraw-Hill Education.

Grau, A. and Reig, A. (2021), "Operating leverage and profitability of SMEs: Agri-food industry in Europe", *Small Business Economics*, Vol. 57 No. 1, pp. 221–242.

Greenblatt, J. (2006), *The little book that beats the Market.* Hoboken, NJ: Wiley.

Greenblatt, J. (2010). *The little book that still beats the market.* Hoboken, NJ: Wiley.

Greenwald, B.C. and Kahn, J. (2005a). *Competition demystified: a radically simplified approach to business strategy*. London: Penguin.

Greenwald, B. and Kahn, J. (2005b), All strategy is local, *Harvard Business Review*, Vol. 83 No. 9, pp. 94–104.

Greenwald, B and Kahn, J. (2008). *Globalization: n. the irrational fear that someone in China will take your job.* Hoboken NJ: Wiley.

Greenwald, B.C., Kahn, J., Bellissimo, E., Cooper, M.A., Santos, T. (2020). *Value investing: from Graham to Buffett and beyond.* Hoboken: NJ: Wiley Finance.

Greenwald, B.C., Kahn, J., Sonkin, P.D., van Biema, M. (2004). *Value investing: From Graham to Buffett and beyond.* Hoboken, NJ: Wiley.

Griffin, T. (2015). *Charlie Munger: The complete investor*. New York: Columbia Business School Publishing, Columbia University Press.

Gu, A.Y. (2004), "Increasing market efficiency: Evidence from the NASDAQ", *American Business Review*, Vol. 22 No. 2, pp. 20-25.

Hagstrom, R. G. (2024). *The Warren Buffett Way.* Hoboken, NJ: Wiley.

Harvey, R.E. (1998), "The world (of investing) according to GARP", *The CPA Journal*, Vol. 68 No. 9, pp. 19.

Haugen, R.A. and Baker, N.L. (2010), "Case closed", In: Guerard Jr., J.B. (Ed.) *Handbook of Portfolio Construction.* New York: Springer, pp. 601-619.

Hirschey, M. (2000), "The "dogs of the Dow" myth", *Financial Review*, Vol. 35 No. 2, pp. 1-16.

Hodnett, K. and Hsieh, H.-H. (2012), "The value of growth at a reasonable price: Evidence from the Taiwan Stock Exchange", *International Business & Economics Research Journal (IBER)*, Vol. 11 No. 9, pp. 1041–1050.

Ho, K.Y. and An, J. (2020), "Decomposing the value premium: The role of intangible information in the Chinese stock market", *Emerging Markets Review*, Vol. 44 September 2020, No. 100700.

Hou, K., Xue, C., Zhang, L. (2017), "A comparison of new factor models", *Fisher College of Business Working Paper Series.* Available from https://deliverypdf.ssrn.com/delivery.php?ID=755006069070006076002065028019103124054081028050051017127068094125004069068090078027054000019062029017012020064095106098103100016013039080081067005082068096089120098086006066114096104024065004016019122081104082026080103018095068083079000126072065114004&EXT=pdf&INDEX=TRUE [Accessed 23 May 2024].

Israel, R., Laursen, K., Richardson, S.A. (2020), "Is (systematic) value investing dead?", *Journal of Portfolio Management Forthcoming.* Available from

https://www.ivey.uwo.ca/media/3790890/is-systematic-value-investing-dead.pdf [accessed 23 May 2024].

Iwanicz-Drozdowska, M., Rogowicz, K., Kurowski, Ł., Smaga, P. (2021), "Two decades of contagion effect on stock markets: Which events are more contagious?", *Journal of Financial Stability*, Vol. 55 August 2021, No. 100907.

Jansen, B.A. (2009). *Operating leverage's role in stock returns, the value premium. And the profitability premium: international evidence.* (Doctoral dissertation, Florida Atlantic University). Available from https://fau.digital.flvc.org/islandora/object/fau%3A40730 [Accessed 18 September 2024].

Ji, Z., Chang, V., Lan, H., Robert Hsu, C.-H., Valverde, R. (2020), "Empirical research on the Fama-French three-factor model and a sentiment-related four-factor model in the Chinese blockchain industry", *Sustainability*, Vol. 12 No. 12, pp. 5170.

Kim, T. K. (2015), "T test as a parametric statistic", *Korean Journal of Anesthesiology*, Vol. 68 No. 6, pp. 540-546.

Klein, D.B. (2018), "Eugene F. Fama", *Economic Journal Watch*, Vol. 5 No. 3, pp. 365-375.

Klein, P. (2023), "Lecture 7: The stochastic growth model" (lecture), *Economics 7218, Quantitative Macroeconomics*, Stockholm University. Available from https://paulklein.ca/newsite/teaching/7218notes723.pdf [Accessed 18 August 2024].

Klinge, T. J., Hendrikse, R., Fernandez, R., & Adriaans, I. (2023), "Augmenting digital monopolies: A corporate financialization perspective on the rise of Big Tech", *Competition & Change*, Vol. 27 No. 2, pp. 332-353.

Kotilainen, M. (2012). Performance comparison of behavioral finance-based investment strategies in the Finnish stock market 1996-2010. (Master's Thesis, Lappeenranta University of Technology). Available from https://lutpub.lut.fi/bitstream/handle/10024/77235/Performance%20Comparison%20of%20Behavioral%20Finance%20-based%20Investment%20Strategies%20in%20the%20Finnish%20Stock%20Market%201996-2010.pdf?sequence=1 [Accessed 23 May 2024].

Lakonishok, J., Shleifer, A., Vishny, R.W. (1994), "Contrarian investment, extrapolation, and risk", *The Journal of Finance*, Vol. 49 No. 5, pp. 1541–1578.

Lam, F.Y., Wang, S., Wei, K.C. (2015), "The profitability premium: Macroeconomic risks or expectation errors?", *Financial Management Association (FMA) 2014 Conference.*. Available from https://deliverypdf.ssrn.com/delivery.php?ID=014117064098127095064097026068002069057020066018053053081100101094126115075127006093100057062011027030018070006004104005091002051035011087029122096098103124083104122061001031089119002118076068087031029018085117113025084031024122073064016023074110072002&EXT=pdf&INDEX=TRUE [Accessed 23 May 2024].

Larkin, P. J. (2009), "Can individual investors capture the value premium?", *Journal of Business & Economics Research (JBER)*, Vol. 7 No. 5, pp. 25-34.

Leavy, B. (2013), "Rita McGrath explores the risks and opportunities of the transient-advantage economy", *Strategy & Leadership*, Vol. 41 No. 4, pp. 10–16.

Lee, S., and Park, S.B. (2014), "A study on the association between operating leverage and risk: The case of the airline industry", *International Journal of Economics and Finance*, Vol. 6 No. 3, pp. 120–125.

Lev, B. (1974), "On the association between operating leverage and risk", *Journal of Financial and Quantitative Analysis*, Vol. 9 No. 4, pp. 627-641.

Lev, B. (2000). *Intangibles: Management, measurement, and reporting.* Lanham, MD: Rowman & Littlefield.

Lev, B. (2018), "The deteriorating usefulness of financial report information and how to reverse it", *Accounting and Business Research*, Vol. 48 No. 5, pp. 465-493.

Lev, B. and Srivastava, A. (2019), "Explaining the recent failure of value investing", *NYU Stern School of Business.* Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3442539 [Accessed 23 May 2024).

Li, M., and Nissim, D. (2014). *Growth, profitability and equity value.* Columbia Business School. Available from

https://www.columbia.edu/~dn75/Growth,%20Profitability%20and%20Equity%20Value%20-%20Li%20and%20Nissim%20-%20July%202014.pdf [Accessed 24 May 2024].

Li, Y. (2015), "Fragile new economy: Intangible capital, corporate savings glut, and financial instability", *Columbia Business School Research Paper*, No 15-46. Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2598182 [Accessed 24 May 2024].

Linnainmaa, J. T., and Roberts, M. R. (2018), "The history of the cross-section of stock return", *The Review of Financial Studies*, Vol. 31 No. 7, pp. 2606-2649.

Lynch, P., and Rothchild, J. (1994). *Beating the street.* New York: Simon & Schuster.

Lynch, P., and Rothchild, J. (2000). *One up on Wall Street: How to use what you already know to make money in the market.* New York: Simon & Schuster.

Magnuson, N. (2011), "The role of expectations in value and glamour stock returns", *Journal of Behavioral Finance*, Vol. 12 No. 2, pp. 98-115.

Mandelker, G. N. and Rhee, S. G. (1984), "The impact of the degrees of operating and financial leverage on systematic risk of common stock", *Journal of Financial and Quantitative Analysis*, Vol. 19 No. 1, pp. 45-57.

Markonah, M., Salim, A., Franciska, J. (2020), "Effect of profitability, leverage, and liquidity to the firm value", *Dinasti International Journal of Economics, Finance & Accounting*, Vol. 1 No. 1, pp. 83–94.

Mauboussin, M. J. (2018), "What does an EV/EBITDA multiple mean?", *Bluemont Investment Research.* Available from https://scholar.google.com/citations?view_op=view_citation&hl=en&user=tzttrvsAAAAJ&citation_for_view=tzttrvsAAAAJ:zA6iFVUQeVQC [Accessed 18 September 2024].

Mauboussin, M. J., Callahan, D., Majd, D. (2017), "The incredible shrinking universe of stocks", *Credit Suisse*. Available from https://topforeignstocks.com/wp-content/uploads/2017/05/Listed-US-companies-Report-by-Credit-Suisse.pdf [Accessed 24 May 2024].

McGrath, R.G. (2013). *The end of competitive advantage: How to keep your strategy moving as fast as your business.* Brighton, MA: Harvard Business Review Press.

Mellal, M.A. (2020), "Obsolescence–A review of the literature", *Technology in Society*, Vol. 63 November 2020, No. 101347.

Mosoeu, S.and Kodongo, O. (2022), "The Fama-French five-factor model and emerging market equity returns", *The Quarterly Review of Economics and Finance*, Vol. 85 August 2022, pp. 55–76.

Muhammad, H.N.S., Hasnawati, S., Fiska, H. (2020), "Fama-French three factor model: A study on LQ 45 companies in Indonesia Stock Exchange", *Journal of Economics and Finance*, Vol. 11 No. 2, pp. 25–30.

Neves, M.E., Abreu Pinto, M., Assunção Fernandes, C.M. de, Simões Vieira, E.F. (2021), "Value and growth stock returns: international evidence", *International Journal of Accounting & Information Management*, Vol. 29 No. 5, pp. 698–733.

Nissim, D. (2021), "Earnings quality", *SSRN Electronic Journal* (Columbia Business School Research Paper: preliminary and incomplete). Available from https://www.researchgate.net/profile/Doron-Nissim/publication/350730869_Earnings_Quality/links/627b969b37329433d9a811c3/Earnings-Quality.pdf [Accessed 24 May 2024].

Nissim, D., and Penman, S. H. (2001), "Ratio analysis and equity valuation: From research to practice", *Review of Accounting Studies*, Vol. 6, pp. 109-154.

Novy-Marx, R. (2013), "The quality dimension of value investing", *Rnm. Simon. Rochester. Edu*, pp. 1–5. Available from https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=3dbf79882ef71aef0e128281142ef074777c09fe [Accessed 24 May 2024].

Obreja, I. (2013), "Book-to-market equity, financial leverage, and the cross-section of stock returns", *The Review of Financial Studies*, Vol. 26 No. 5, pp. 1146–1189.

Paired t-test in SPSS (2024). Available from https://www.bristol.ac.uk/cmm/media/research/ba-teaching-ebooks/pdf/Paired%20t%20tests%20-%20Practical.pdf [accessed 18 July 2024].

Park, H. (2019), "An intangible-adjusted book-to-market ratio still predicts stock returns", *Critical Finance Review*, Vol. 25 No. 1, pp. 207–236.

Pástor, Ľ. and Vorsatz, M.B. (2020), "Mutual fund performance and flows during the COVID-19 crisis", *The Review of Asset Pricing Studies,* Vol. 10 No. 4, pp. 791–833.

Pätäri, E. J., and Leivo, T. H. (2009), "Performance of the value strategies in the Finnish stock markets", *Journal of Money, Investment and Banking*, Vol. 2 No. 8, pp. 5-24.

Pätäri, E.J. and Leivo, T.H. (2010), "Persistence in relative valuation difference between value and glamour Stocks: The Finnish experience", *Banking & Finance Letters*, Vol. 2 No. 3, pp. 319–324.

Pätäri, E. and Leivo, T. (2017), "A closer look at value premium: Literature review and synthesis", *Journal of Economic Surveys*, Vol. 31 No. 1, pp. 79–168.

Pettengill, G., Chang, G., Hueng, C.J. (2014), "Choosing between value and growth in mutual fund investing", *Financial Services Review*, Vol. 23 No. 4, pp. 341–359.

PR Newswire (2011), "Zacks investment ideas feature highlights: Datalink, Cabela's, Team, Rocky Brands and Penn National Gaming", *PR Newswire US.*

Price, T.R. (2013). *Picking growth stocks.* Whitefish, MT*:* Literary Licensing, LLC.

Priyanto, P. (2020), "The value of GARP Investing: evidence from the Indonesian Stock Exchange", *Journal of Accounting and Business Education,* Vol. 5 No. 2, pp. 9-20.

Qadan, M., Jacob, M. (2022), "The value premium and investors' appetite for risk". *International Review of Economics & Finance*, Vol. 82 November 2022, pp. 194-219.

Raiwani, Y.P. (2013), "Internet of things: a new paradigm", *International Journal of Scientific and Research Publications*, Vol. 3 No. 4, pp. 1–4.

Ramezani, C.A., Soenen, L., Jung, A. (2002), "Growth, corporate profitability, and value creation", *Financial Analysts Journal*, Vol. 58 No. 6, pp. 56–67.

Rappaport, A., and Mauboussin, M. J. (2003). *Expectations investing: Reading stock prices for better returns.* Brighton, MA: Harvard Business Press.

Rasul, M.S. (2013), "Pervasiveness of value premium: A study on Dhaka Stock Exchange", *Asian Journal of Research in Business Economics and Management*, Vol. 3 No. 10, pp. 289-302.

Rodney, B.D. (2020), "Understanding the paradigm shift in education in the twenty-first century: The role of technology and the Internet of Things", *Worldwide Hospitality and Tourism Themes*, Vol. 12 No. 1, pp. 35–47.

Rogers, D.L. (2000), "A paradigm shift: Technology integration for higher education in the new millennium", *AACE Review (Formerly AACE Journal)*, Vol. 1 No. 13, pp. 19–33.

Rohuma, H. (2023), "Value stocks versus growth stocks: An examination of Bursa Malaysia", *International Journal of Economics and Financial Issues*, Vol. 13 No. 4, pp.143-151.

Sharma, D.K., Srivastava, R.K., Gupta, P. (2024), "Study of stock returns through P/E, PEG and PERG: evidence from Nifty-100", *International Journal of Business and Globalisation*, Vol. 36 No. 1, pp. 83–96.

Soloviova, N. (2020). Consistent outperformance of the value investing paradigm: The performance of superinvestors and pragmatic investors. (Master Thesis, Lappeenranta-Lahti Univerisity of Technology). Available from https://www.researchgate.net/publication/350495694_Consistent_Outperformance_of_the_Value_Investing_Paradigm_The_Performance_of_Superinvestors_and_Pragmatic_Investors [Accessed 18 September 2024].

Spierdijk, L., Bikker, J.A., Van den Hoek, P. (2012), "Mean reversion in international stock markets: An empirical analysis of the 20th century", *Journal of International Money and Finance*, Vol. 31 No. 2, pp. 228–249.

Sprague, R. (2010), "Applying the electronic communications privacy act in the workplace: Struggling to keep pace with paradigm shifts in technology". *SSRN Electronic Journal*, No. 1728197. Available from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1728197 [Accessed 18 September 2024].

Stagnol, L., Lopez, C., Roncalli, T., Taillardat, B. (2021), "Understanding the performance of the equity value factor, *SSRN Electronic Journal*, No. 3813572. Available from DOI:10.2139/ssrn.3813572 [Accessed 18 September 2024].

Stiglitz, J. E. (2003), "Globalization and growth in emerging markets and the new economy", *Journal of Policy Modelling*, Vol. 25 No. 5, pp. 505-524.

Stiglitz, J. E. (2017), "The overselling of globalization", *Business Economics*, Vol. 52 August 2017, pp. 129-137.

Tao, Q., Zahid, Z., Mughal, A., Shahzad, F. (2022), "Does operating leverage increase firm's profitability and bankruptcy risk? Evidence from China's entry into WTO", *International Journal of Finance & Economics*, Vol. 27 No. 4, pp. 4705–4721.

Tapscott, D. and Caston, A. (1994), "Paradigm shift: The new promise of information technology", *Economic Development Journal of Canada*, pp. 62–66. Available from https://ecdev.journals.yorku.ca/index.php/default/article/view/178 [Accessed 24 May 2024].

The surprising world according to GARP (2020), *Dow Theory Forecasts*, Vol. 76 No. 46, pp. 1–5.

Tóth, B. and Kertész, J. (2006), "Increasing market efficiency: Evolution of cross-correlations of stock returns", *Physica A: Statistical Mechanics and its Applications*, Vol. 360 No. 2, pp. 505–515.

Turney, S. (2023), "Skewness | Definition, examples & formula", *Scribbr*. Available from https://www.scribbr.com/statistics/skewness/ [Accessed 19 August 2024].

Turney, S. (2024), "What is kurtosis? | Definition, examples & formula", *Scribbr*. Available from https://www.scribbr.com/statistics/kurtosis/ [Accessed 19 August 2024].

Urban, D. L. (2020). Do value stocks outperform glamour stocks? (Bachelor's Thesis, Erasmus University Rotterdam). Available from https://thesis.eur.nl/pub/53088/ [Accessed 24 May 2024].

Ventura, C. M., Cizek, P., & Benink, H. (2024), "Financial fragility indexes for Latin American countries", *CentER Discussion Paper*, Vol. 2024 No. 004, pp. 1-90.

Wang, J. (2011), "Impact of investment horizon on the performance of value versus growth styles and style allocation", *Journal of Asset Management*, Vol. 12 May 2011, pp. 438-446.

Weis, C., Woltering, R.-O., Sebastian, S. (2021), "Which stocks are driven by which interest rates? evidence from listed real estate", *Journal of Property Research*, Vol. 38 No. 3, pp. 175-197.

Wirawan, G.H., Sumirat, E. (2021), "Performance analysis of investment portfolio strategy using Warren Buffett, Benjamin Graham, and Peter Lynch Method in Indonesia Stock Exchange", *European Journal of Business and Management Research*, Vol. 6 No. 4, pp. 394-401.

Woo, K.-Y., Mai, C., McAleer, M., Wong, W.-K. (2020), "Review on efficiency and anomalies in stock markets", *Economies*, Vol. 8 No. 1, pp. 20. Available from https://www.mdpi.com/2227-7099/8/1/20 [Accessed 24 May 2024].

Yang, L., Tapon, F., & Sun, Y. (2006), "International correlations across stock markets and industries: Trends and patterns 1988–2002", *Applied Financial Economics*, Vol. 16 No. 16, pp. 1171-1183.

Yang, J.-S., Kwak, W., Kaizoji, T., Kim, I. (2008), "Increasing market efficiency in the stock markets", *The European Physical Journal of Business*, Vol. 61 February 2008, pp. 241–246.

Yen, J.Y., Sun, Q., Yan, Y. (2004), "Value versus growth stocks in Singapore", *Journal of Multinational Financial Management*, Vol. 14 No. 1, pp. 19–34.

Zhang, A. H. (2024). *High wire: How China regulates big tech and governs its economy*. Oxford: Oxford University Press.

Zhang, L. (2005), "The value premium", *The Journal of Finance*, Vol. 60 No. 1, pp. 67-103.