'The Effect of Monetary Policy Post the Global Financial Crisis on Value Investments in the US and EU Markets'

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Abstract

"A review of the empirical and academic evidence of the effect of monetary policy on value investments in the US and EU markets. Examining the relationship between historic low interest rates and value returns for the period 2008 – 2019. Contrasting these findings with other popular investing strategies such as "growth investing" and the market as a whole.

This research was conducted to understand the relevance of value investing in today's investing environment and to aid to further research to suggest whether this method of stock selection is heading towards obsolesce or can be revived."

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Abbreviations

- P/E Price to earnings ratio
- P/B Price to book value of equity ratio
- P/S Price to sales ratio
- P/CF Price to cash flow
- DY Dividend Yield
- CAPM Capital Asset Price Model
- ROA Return on Assets
- ROIC Return on Invested Capital
- HML High Minus Low, the spread in annual return between companies

Key Terms

- *Global Financial Crisis 2007-2008*: sever worldwide financial crisis caused by the failure of a number of financial institutions. This caused worldwide economic contractions and forced central banks to intervene to save the financial system.
- *Time period of low interest rates*: 2011 -2019
- *Value Investing*: The term given to the investment strategy, which uses fundamental analysis of equities accounting information to determine investment decisions
- *Monetary policy*: Defines monetary policy as the term given to the process by which a monetary authority of a country, which controls the supply of money manages interest rates to meet its objectives
- *Quantitative easing:* Large scale asset purchasing program, purchasing sovereign and corporate debt on a large scale to increase the money supply in an economy.
- *EU Market*: iShares European Value Index
- *US Market*: iShares S&P 500 Value index
- *Interest rate*: Federal Funds Rate in the US & ECB Marginal Lending rate.

1 Introduction

Penman & Reggiiani, (2017) Define value investing as the term given to the investment strategy, which uses fundamental analysis of equities accounting information to determine investment decisions. This investment style is one of the most widely used methods of investing.

Hoggarth, (1996) Defines monetary policy as the term given to the process by which a monetary authority of a country, which controls the supply of money manages interest rates to meet its objectives.

Benjamin Graham and David Dodd developed this method of investing in 1934, they pioneered this idea and formulised a framework in their book security analysis. The idea encouraged investors to purchase equities which traded at a discount to their intrinsic value.

This research will examine this method of investing in the modern market both through primary and secondary research. The primary research will include the gathering of data from sources such as the Federal Reserve Bank, European Central Bank and stock price data from BlackRock's iShares platform. This data will be analysed to determine whether monetary policy decisions made by both the Federal Reserve in the US or the ECB in the EU have disproportionately affected value investments. This question is a popular topic of discussion among academics and a very important question for the investment management industry going forward.

Yung Li (2019) supports the view that current monetary policy, which has led to the long period of low interest rates is the first culprit to blame for the demise of value investing. The historic outperformance of value investments may require higher interest rates, which could be structurally difficult to achieve in the near future.

Bernstein (2019) outlines how the investment strategy may have become irrelevant thanks to central banks and technology. The sustained period of low interest rates is the major culprit for the underperformance of value investing. Monetary authorities implemented quantitative easing (QE) program to save their respective economies following the global financial crisis. This in turn raised equity valuations across the board, reducing any premium on value stocks. QE may have disrupted the mean reversion process, which is the process of stock prices returning to the average prices this usually occurs in an economic cycle.

Kaisasar (2019) supports this argument outlining that since early 2007 a brutal and rare 12 year stretch of underperformance has occurred. For the last 100 years the time data is available, value has underperformed just twice before the Great Depression and the Dot.Com bubble in the late 1990s. Max (2019), supports the view that central bank monetary policy of ultra-low interest rates and quantitative easing and its impact on the yield curve has led to cheap cash becoming available to rich growth companies and provided an even bigger advantage over value stocks as they tend to carry more debt. These views are further supported by Stepek, (2019) who suggests that the well-known factor which consistently beats the market can no longer be relied on because of persistent low interest rates and the digitisation of the economy.

Stepek (2019) outlines that the world of low interest rates and inflation is a better investment environment for longer term assets that promise to deliver profits in the future rather than today. Low profit high growth tech companies fit this bill perfectly. With monetary authorities deemed likely to lower interest rates further in the near future, will normal monetary policy ever resume or does the fact that value stocks are trading at a historic discount make it important to have some exposure anyway?

This is highlighted by the fact the S&P 500 iShares Value ETF has lagged the market consistently for the past five years. Max, (2019) outlines how historically value investing has performed in peaks and trough's sometimes lagging behind but winning the race eventually from January 1927 – 2016, Value stocks in the US have posted a 12.5% annual return compared to growths 9.5%. However, the gap between value stocks and growth stocks has gotten so wide and so consistent that the question persists will value investments catch up? The spread currently between the Russel value 1000 index and Russell growth index is the widest in its history. Another questions this presents is are value stocks currently the best long term bet in the market or are they on the way to obsolescence.

Fama and French, (2018) argue that investors should not be surprised by values underperformance they examined the NYSE between the period 1963 – 2016, found that it is common for value to underperform in three to five year cycles and ten year cycles are far from rare.

An alternative explanation for the underperformance of value investing is outlined by Carlson (2019) who suggests that the disruption of every major industry is too blame. Intangible assets, such as software or brand, are bigger factors in new world companies, however price to book ratios – a popular measure of value don't reflect these assets. This can make growth companies appear more expensive, and could contribute to the growing disparity between growth and value – and also mislead investors who bank on mean reversion for value stocks.

Yung Li, (2019) raises an important question is the extended period of growth investing outperformance coming as a result of a once in a generation event such as the global financial crisis? This raises an important question for investors, once interest rates return to a normal will the historic outperformance of value return?

This research combines primary and secondary data in an attempt to contribute to these questions. It is important to understand whether the tried and tested strategy will endure into the future if monetary policy normalises, or will growths outperformance continue in perpetuity.

The secondary data will firstly analyse the history of investing and how asset prices are currently valued. The aim of this section is to understand the different variables which contribute to expected returns and how interest rates may effect these models. This review will range from modern portfolio theory Markowitz (1959) the Capital Asset Pricing Model key papers Sharpe (1964), Linter (1965) and Mossin (1966) and Arbitrage Pricing Theory Ross (1976).

The research will then examine the efficient market hypothesis to understand Fama, (1970) which is an underpinning assumption of most asset pricing models. Which states markets are efficient and stock prices cannot be predicted into the future. It is by this area of academic study which provides a definition for the value premium, which is the discount value stocks trade at compared to other stocks mainly growth.

The research examines closely the key academic papers on value investing highlighting its limitations and applications in capital markets key papers include Lakonishok, Shleifer and Vishny (1994).

The historic returns of value are also analysed with many papers available on this topic including Pappas and Dickson (2015), which highlights points through history where value has underperformed. These points in time are the Great Depression and the Dot com bubble are all market events which required monetary authorities to respond with abnormal policy such as low interest rates and quantitative easing.

The research also examines the evidence for value investments outperformance in both the US where the academic literature is vast and deep Ou and Penman (1989) is one of the key papers for that

jurisdiction. International markets where the research is sparse and a gap appears Lewis (1989) is a key paper, which provides evidence of value premium in European markets. A table outlining key papers per jurisdiction can be viewed in appendix 1.

The research also examines primary and secondary research for monetary policy and how monetary policy specifically interest rates effect both investment markets and value investing. Key papers in this area are Hoggarth, (1996) and Palley (2007). Gwilym, (2003) is an important paper which analyses interest rates changes and equity prices.

The primary data analyse takes market information stock price data and interest rates from the iShares Value index and the European Central Bank and Federal Reserve Bank in the EU and US. Statistical tests were conducted and the findings analysed and discussed. The aim of this research was to understand the effect low interest rates has had on the value investment returns. The research also will aim to highlight the significance of any relationship and determine if this relationship is more significant than other investment strategies.

Value investing is a common method of equity selection and has strong support academically and in the market place of reliance and performance. Research in this area is important as it helps to identify if the modern investment environment can still support value returns or has the marketplace fundamentally changes to a place where the value investing strategy will no longer provide returns above a passive investment Theoretical Foundation

2 A Brief History of Investing

The framework for modern portfolio theory (MPT) was developed originally by Harry Markowitz (1959). The concept was that a given return is only achieved by assuming a given risk. As such an investor has the choice between a given set of portfolios, which represent different risk reward profiles. Risk represents an uncertain outcome a loss which cannot be foreseen. Berger, (2011) Markowitz calculated the risk profile of each portfolio with a formula, highlighting for any investor no matter their risk profile there was a portfolio, which would maximise returns. These portfolios are referred to as efficient portfolios. These portfolios can be illustrated on a curve showing the relationship between risk and return described as the efficient frontier. However, the price of the asset in the portfolio represents the present value of its discounted future value.

2.1 Capital Asset Pricing Model

This work was carried forward and evolved Sharpe (1964) Linter (1965) and Mossin (1966) each in isolation developed the basic underpinnings of modern portfolio theory and in doing so created the capital asset pricing model (CAPM). CAPM outlines that the expected return of any given asset can be calculated as the risk free rate, which is typically the yield on a short term US treasury. The formula multiplies the market's beta by the market risk premium and adds this to the risk free rate. CAPM assumes that the market can be divided into sections for market risk and divisibility, this provides an average of valuing assets which only includes market risk. CAPM is widely used, and describes equilibrium asset prices in the market.

Critiques of the assumptions of CAPM such as Ross (1976) presented arbitrage pricing theory (APT) as a competitor model to CAPM. Ross argues that CAPM is too rigid, as its return expectations and the risk profile of investors are assumed to be equal. Bower et al. (1984); Fama and French (1997) Voice other common critiques including the assumption of a sophisticated mean-variance optimising investor.

(Alves, 2013) outlines the assumptions as follows, investors only consider expected returns when investing. Investors must be rational and adjust their portfolios to the optimal allocation frequently. All investors have a harmonised view on global expected returns. Investment markets are competitive and no action of an investor would affect an equities price. The existence of a risk free rate, which all investors can avail of equally to attain credit. No taxes or transactions costs exist which could limit returns.

The Capital Asset Pricing Model was the most popular method to value financial assets and was used both in academic circles and by market participants to calculate the relationship between risk and return until the 1970s. Sehgal & Balakrishman, (2013). However, as markets became more complex the single factor model began to become less influential in practical asset valuation. The evolution of the multi factor models included factors such as: 1) company size 2) the value effect 3) P/E ratio 4) Debt to Equity ratio 5) book market to equity ratio. Sehgal & Balakrishman, (2013) identify the most statistically significant factors as size and value, which was measured by book value to market value.

Fama and French (2003) were fierce critics and represented prominent academics with strong views on asset pricing. They also advocated a three factor model which considered risk, value and size. Their findings identified that the three factor model was a more stable indicator of asset prices and accounted for anomalies in CAPM.

Ross, (1976) Outlined when these assumptions are loosened (APT) can achieve better forecasts for expected return of assets than CAPM. APT outlines how a financial asset return can be defined as a function of a macro-economic factors or theoretically with a beta coefficient for each factor. The rate of return is then used as a discount rate for future cash flows or payoffs to arrive at the correct price. Variations between calculated and actual asset prices in theory should not exist for a prolonged period of time as the market should arbitrage them away. This assumes all market participants have equal full information and are rational enough that stock prices are priced according to their fundamental value.

The arbitrage theory has been the basis for other leading academic work in asset pricing, Black and Scholes (1973) and Merton (1973). This work lead to the development of derivative pricing models mainly for options, which are widely used. Fama and French (1993) built on CAPM further by including factors which were previously not considered. Using the quantitative techniques such time series regression, they could illustrate that a company's accounting ratio and size and book to market equity are key determinants of the variance in equity returns. This approach, which was coined the three-factor model has commonly been adopted to understand asset returns compared to the appearance of "anomalies" in the market (Malkiel, 2003).

(Jovanovich, 2008) Suggests the various asset pricing models outlined thus far are corners stones of financial economics and came to prominence through the scientific accreditation in the 1960s. These pricing models offer differing approaches to asset valuation, often they have the same underlying assumptions as the efficient market hypothesis (EMH). The next section will outline the underpinnings of EMH and illustrate some of the limitations.

2.2   The Efficient Market Hypothesis (EMH).

The aim of the following section is to discuss and critique the theory which underpins the foundations of all the asset pricing models, which are discussed above. The asset pricing models in question all establish parameters or assumptions, which create an artificial environment that replicates real capital markets. The most basic assumption is that EMH assumes the asset price immediately incorporates

all information into its valuation. The inference is that there is no advantage to having superior financial information and that extra return is purely predicated on the given level of risk.

Introduced by (Fama, 1970) EMH is the main assumption of many key asset pricing models. EMH famously outlines that equities follow a random walk. Past stock price information cannot predict future price performance and have no relevance. (Samuelson, 1965) introduced this concept, suggesting randomness is driven by greed of market participants. Investors act on information based on their own interests. As price is driven by demand in the short term, the information which investors act is constantly being absorbed into the price.

As such arbitrage is quickly diminished and returns which would be considered abnormal are extremely rare. (Fama, 1991) summarises EMH as "the simple statement that security prices fully reflect all available information".

EMH is divided into three forms: weak form, semi strong and strong. (Smith, 2012) outlines that weak form suggests that past price information cannot predict future price information. This form of EMH would suggest technical analysis of stock markets has no use and cannot provide excess returns over and above the market. Empirical evidence for weak form EMH is based on variance ratio tests outlined in Lo and Mackinlay, (1988) and supporting findings in Kim and Shamsuddin, (2008).

Semi strong form outlines that all past price information and all available public information, such as earnings reports, financial statements and company news are included in the price. Suggesting any expert analysis of this information can provide no competitive and edge and will not provide excess market returns. (Chordia et al, 2005) illustrates equity price movements in half hour intervals to depict the speed of market price convergence highlighting the speed in which information is consumed into an asset price. The strong form EMH outlines that even with insider information an investor cannot achieve higher than average investment returns, which has no significant academic support.

2.3   Limits of EMH

Fama (1970) outlines three basic assumptions that an efficient market must incorporate to ensure that information is reflected in prices. Financial transaction costs are assumed to be zero, there is no cost to gathering financial information and finally, markets are liquid.

Transaction costs have been falling steadily in the investment management industry since Fama's 1970s seminal paper. This in part is due to the digitisation of the finance industry reducing costs. However, the assumption of zero transaction costs is clearly false.

The assumption of zero cost to attaining financial information is also not a realistic. The cost today of accessing financial information is again cheaper than in 1970s. This assumption was critiqued by Grossman (1976) and Grossman and Stiglitz (1980). The findings outlined that financial research would become unprofitable and therefore would not be a task which any rational investor would undertake. As a result of this halt in research markets would grind to a halt. Fama (1991) addressed this by softening the assumption and saying investors will only pay for information if the marginal benefit exceeds the marginal costs. This in turn negates the first assumption as the cost of information is a transaction cost. As such the theory is mainly focused on the assumption of liquid markets.

The final assumption is open to debate. In Fama (1970) the statement in itself is not explicit in outlining an agreement between investors on price implications or whether if this agreement is reached tacitly. Tacit collusion on this agreement is supported by Clement (1999) outlined that there were variances identified systemic analyst forecasts. This was compounded by Gleason and Lee (2003) when differences in pricing was correlated with analyst coverage.

Academic discussion centres on the search for a better theory. Jensen (1978) provided empirical evidence, which supported EMH. This evidence was highlighted by EMH supporters for decades. The validation of academic theory was summarised by Friedman (1953) stated "it is both impossible to refute theoretical hypotheses and to prove them empirically." In spite of this EMH has been a popular topic among academics.

Banz (1981) initiated the discussion around how this theory could be evaluated and used to identify anomalies, which do not confirm with EMH. Banz studied examined equity risk adjusted returns on company's based on size. The evidence pointed to high returns for small firms that were over and above expected return models like CAPM. Banz (1983) added to this work by outlining how firms with high earnings "quality" firms, outperform compared a sample of other firms. This suggests that these anomalies provided higher return trends. This forecasting ability is in stark contrast with a random walk asset pricing hypothesis.

Another commonly accepted anomaly was known as the holiday effect, it could be forecasted that at certain times in the year market returns were either above or below the market. Siegal, (2002) & Cho et al (2007) outline how returns are even shown to be consistently higher on a Friday and lower on a Monday compared to the average. January was also found by Keim (1983) to exhibit lower returns compared to the other eleven months of the year. This forecasting of returns is at contrast again with the random walk philosophy of returns and also is a clear detractor from the validity of the above mentioned asset pricing models.

The above sections outlining anomalies are not the main focus of this research, they support the conclusion that investors do not in general make rational decisions based on the information available. The humanness of investors was highlighted by DeBondt and Thaler (1985) and Kahneman and Tversky (1982), there argument suggested that overconfidence in an investor's perceived ability to predict market returns. The given optimism or pessimism in the market creates inefficiencies in prices.

The evidence suggests that contrarian strategies, purchasing unpopular equites and potentially selling or shorting favoured stocks could achieve profits. A type of contrarian investment strategy is value investing, which selects investments which are undervalued based on key accounting/financial ratios such as price to book value, price to cash flow and price earnings ratio. By adopting this approach and selecting investments based on financial ratios, value investors aim to return higher than risk adjusted returns compared to the relative market indices. Benjamin Graham and David Dodd (1934) first formalised this approach.

Kothari (2001) provided a review of the empirical evidence on the importance of the relationship between company financial statements and stock markets. This categorised the literature on this topic into five main areas. i)Methodical investment market, ii) review of contrasting accounting performance methods, iii) valuation and fundamental research, iv) market efficiency tests, v) value importance of disclosures according to other accounting standards and the asset valuation consequences of various accounting standards. It should be noted that this dissertation is most concerned with point iii). As such the report assumes that semi strong form EMH is not valid, which outlines that publically available financial information research has no value in aiding in investment making decisions.

The literature is divided with support for and against the efficient market hypothesis. However, I think it is rational to argue that stock prices do not follow a random walk and information, knowledge skill and experience all provide investors with an edge in achieving returns. Fama and French (2006) have even found evidence which contrasts the original outline of the theory. By using CAPM as the pricing

model significant variances for the period 1963 – 2004 were discovered. Among others these included large betas for growth stocks in comparison to value stocks. This is in stark contrast to the assumptions of CAPM which suggests the higher risk stocks "growth" should provide higher returns compared to value.

Fama and French (2012) outlined a value premium across major financial markets that was adversely correlated with size. The effects of the forecasting of this premium on the theory of market efficiency is not discussed in either paper. This was noted by Dempsey (2013) who suggested it was concerning that the papers discussed the limitations of CAPM but not EMH.

2.4   Support for EMH

The validity of EMH has been eroded in recent times as outlined above, however its usefulness for describing financial markets should not be forgotten. EMH describes markets which are in equilibrium, as such this can be described as an idealistic version of markets. Graham (2005) famously described financial markets as a voting mechanism but has evolved to become a weighing mechanism.

This description of markets was coined by Benjamin Graham the father of value investing in the 1960s. The connotation of the phrase is that short term mispricing's are accepted. Advocates of EMH quote Graham, Malkiel (2003) outlined how Graham declared "I am no longer an advocate of elaborate techniques of security analysis in order to find superior value opportunities. I doubt whether such extensive efforts will generate sufficiently superior selections to justify their cost. I'm on the efficient market school of thought." This is startling as Graham a practising investor who created the fundamental method of research for investing decision making, which this dissertation is centred and will be discussed in great detail.

Fama and French (2006) highlighted that CAPM could explain the value premium up until 1963, however after this it cannot be explained. This was supported for the same period by Ang and Chen (2007). Malkiel (2003) provided an explanation for this by outlining that the value anomaly occur because fundamental accounting indicators are a better measure of risk than beta.

2.5   Alternatives Explanations for a Value Premium

Alternative explanations for a value premium have been put forward by academics. Banz (1981), Reinganum (1980) and Stattman (1980) have argued that it is a result of the size of a firm rather than accounting indicators such as price to book value or P/E ratio. Their empirical evidence highlighted a more significant relationship between equity performance and size, than performance and ratios.

Banz (1981) examined the value premium over a long period 1926-1975. Indeed Banz discovered a value premium, however attributed this to firm size. Analysing the NYSE he discovered a premium where small companies by market capitalisation outperformed large companies by market capitalisation. This was an important finding as they could not be attributed to CAPM.

Klein and Bawa (1977) outlines the outperformance of small firms may be attributed too, the reluctance to hold small companies. As there is comparatively less information for these firms available to the public. Commonly risk adverse investors prefer to purchase equities which have the most available information. This inhibits demand for small cap companies, in turn this means a lower price. Once the market recognises the true valuation of a company the price increases. The accounting ratios P/E and book to market value could be a reflection of this.

A three factor valuation model was created by Fama and French (1996). This valuation model includes both the book to market ratio and the size factor. The aim was to concentrate the study on the

existence of a value premium. This valuation model proved extremely popular with academics, this paper provided a thorough overview of the value premium.

Another argument against the existence of a value premium is that the outperformance is attributed to a selection of equities which have a higher risk profile. Chan and Chen (1991) examined NYSE data and were able to establish that there is a risk involved in purchasing equities with a small market capitalisation. They attribute the higher risk to the evidence that small companies listed on the NYSE are highly leveraged.

Chen and Zhang (1998) supports the view that risk is a factor in value investing. Their paper proposed a model which measured risk as the volatility of a company and then this model was applied to six different countries. The results of the study created a formula for value investing which included dividends, financial leverage and the volatility measured as the standard deviation of returns of an equity. The conclusion again attributed the premium to excess risk and supports the argument that over a long time horizon that value strategies outperform growth.

Contradicting this view a number of studies suggest higher risk has a much less significant influence on the value premium. Basu (1977) found that value stocks outperform growth stocks on both a risk adjusted and absolute basis. These findings have been supported by Reinganum (1980), Lakonishok et al (1994), Arshanapali at al. (1998) and Fama and French (1998) and Kwag and Lee (2006) found evidence which would suggest that the value premium, the excess returns relative to growth stocks cannot or only in part be attributed to a higher risk profile of growth stocks.

Risk is typically defined as the volatility of a stock price. However, another definition was put forward by Buffett, (2012) *"Assets can fluctuate greatly in price and not to be risky as long as they are reasonably certain to deliver increased purchasing power over their holding period. And as we will see, a non-fluctuating asset can be laden with risk"*.

2.6   Survivorship bias

Breen and Korajczyk (1994) examined if selection bias could have affected the results of research on NYSE data, this was refuted when the results matched a secondary source. Kothari, Schanken and Sloan (1995) found that companies which report very significant growth rates in the earnings are more likely to have a high book to market ratio. This was supported by Chan, Jegadeesh and Lakonishok (1995) who found that there was no material selection bias impact.

Chan et al (1995) summarised that further research on the value premium should refer to the possibility of selection bias in the data used. The companies which become bankrupt or removed from exchanges over any given period being examined should be highlighted and an explanation on how this affects the findings should be provided. This will be considered in the empirical analyse undertaken in this study.

3   Value Investing

The below section provides a literature review for the value investing strategy, which is a strategy which uses financial statement information and ratios to make investment decisions. This report is centred on value investing and the effect monetary policy has on the expected returns of this strategy. This section will outline the historic returns per region documented in the literature.

This study will examine periods of time when value investing was a profitable investing strategy, which outperformed the market and will also examine periods where value investments underperformed

the market. By analysing these time periods the aim will be to understand if monetary policy is a key determinant to value investments long term success.

The relationship between macroeconomic indicators and investing has been researched extensively and will be discussed in detail below. Resnick and Shoesmith, (2002). Cornell (2010) supports this view "the performance of equity investments is inextricably linked to economic growth" Revenues or earnings are the source of value for equities, which are driven by macroeconomic indicators. The power to predict turning points of the economy are invaluable.

Feng and Baruch (2017) provide further support the value of earnings when estimating a company's worth. "Reported earnings are the single most widely followed measure of firm performance". Whether these earnings meet, beat or miss analyse estimates is a leading factor in stock price movements.

Penman & Reggiani, (2017) Value investing is an investment strategy, which uses fundamental analyse of accounting information to value equities and make investment decisions. The strategy is historically one of the most popular and resilient styles of investing. However, the strategy hasn't evolved substantially since it was first brought to mainstream markets. KOK, et al (2007) defines the strategy as simply the method of selecting equities which represent good value.

Graham & Dodd (1934) first developed the idea of investment selection based on selecting equities which had strong accounting fundamentals relative to the market value of the company. The highlighted book value to market value as a key ratio in determining a company's value. This method became known as value investing.

Fama and French (2007) define value investments, as companies with low ratios of market value to book value and outline that historically they have higher returns to growth companies. Growth companies are defined as companies with weak accounting fundamentals. Loss making with high annual revenue growth rates. Investors invest in growth companies because they are optimistic about their future.

Markowicz (2018) outlines two reasons for value stocks out performance of growth stocks historically. Firstly, investors behavioural tendencies to overreact to good or bad news and project past revenue growth rates into the future. Therefore, investors tend to overpay for growth and underpay for value. The gap which this creates between valuations is a result of sentiment rather than an analysis of the fundamental value of an investment. Baurman et al (1998) summarise this outlining the outperformance is the result of systemic suboptimal market actions on the part all participants.

Finally, the explanation put forth is related to risk and that value investment are riskier investments and therefore the extra return is the compensation an investor received for this increase risk. This view is supported by Fama and French (1992) suggest that value company's may be riskier and thus require a return premium.

As companies are valued using expected earnings, Kahenman and Tversky (1982) outline that investors place more faith in recent market information or news than historic market events. Thaler (1987) outlines that investors overreact to past events. As such equities with recent favourable market sentiment have the majority of capital flowing to them. This demand increases prices, however valuable information which highlight companies with strong value which are not currently in vogue is not heeded in the same manner.

Thalers hypothesis suggests speculative factors result equity prices to deviate from the historic factors and that over time prices revert to their historical averages. Therefore, equities which are trading below their historic averages are forecast to provide market outperformance in the future.

The theory discusses an academic review of value investing; however, it may be beneficial to outline some practical examples. The most successful value investor, Warren Buffet has consistently achieved significantly above market returns. This outperformance was documented by Martin and Puthenpurackal, (2008). Buffet focuses on accounting fundamentals information, which is contained in a company's financial statement. This framework for value investing is limited as it ignores some relevant indicators of value such as, cash distributions and the liquidity of an investment.

Chee et al (2013) suggested that defining value investments as companies by just examining stocks with low book to market ratios would be an oversimplification. The problem with this method of estimating a stock's value is that there is no robust evidence to that a company's book value reverts to its market value. This limitation has meant a modern interpretation of value investments focuses on earnings power as the key determinant in selecting value investments.

Berk & H Van Binsbergen (2018) This earning power commonly manifests as projecting the company's future cash flows. These cashflows are then discounted into a present value by using a discount factor. This count factor is typically the cost of capital for a company or plainly the interest rates a company is obliged to pay on any debt they have issued.

Lakonishok, Shleifer and Vishny (1994) defines a value premium as the variance in returns between equities with low and high valuations, in these cases excess returns cannot be associated with higher risks. Investors categorise stocks with high book value compared to market value (B/M), a low price to earnings ratio (P/E) or a high cash flow yield (CF) as value stocks. Other equities which could be considered, have characteristics such as high return on assets (ROA) or (ROIC) return on invested capital should also be included as value stocks. This is because they are purchased to a relatively low price compared to their recent performance.

The strategy of investing in equities based on accounting indicators gained notoriety and attention in academic circles initially with Basu (1977) who was able to highlight a link between the P/E ratio and equity price performance, supporting this Chan, Hamao and Lakonishok (1991) and Capaul, Rowley and Sharpe (1993) observed a strong correlation between the book value to market value and equity returns. Bauman, Conover and Miller (1998) and EMH hardliners Fama and French (1998) analysed value investing strategies internationally and found that value outperforms growth strategies in almost every country. These studies used P/E and P/B as indicators of value. Growth stocks refer to companies with high revenue growth rates, investors favour these investments even if the companies are loss making. Hoping to reap the rewards of unearthing a unicorn type company in the future. Growth is commonly thought to be the opposite of value.

Haugen (1995) and Lakonishok et al (1994) suggested that the value premium is caused when investors undervalue companies which are currently in turmoil and that the market overvalues growth companies. These price discrepancies are corrected in the long term, this results in lower returns for growth stocks and higher returns in values stocks.

Index providers such as Russell, Dow Jones and Standard & Poor utilise these indicators of value to compile value benchmarks. Which is a composite of companies with value characteristics, whose performance is tracked and used as an indicator to how the strategy is performing.

3.1 Value Investing Returns

Various academics have conducted research outlining how value stocks provide superior returns to growth stocks and the general market historically. Pappas and Dickson (2015) However, highlighted since the financial crisis in 2008 value investments have endured a decade of underperformance. This report aims to identify the reasons for this underperformance and if the actions taken by monetary authorities in the wake of the crisis have changed the value investment landscape for good.
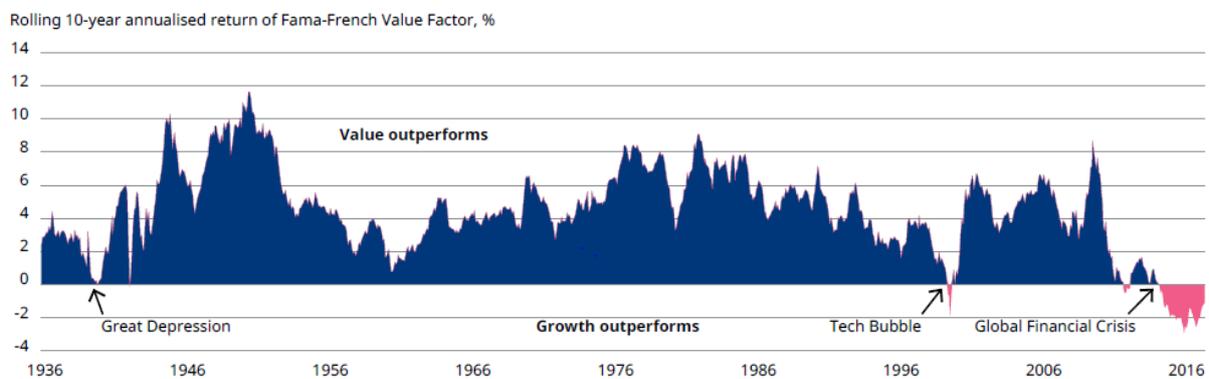
(Figure 1)

The graph above outlines the performance of value strategy relative to a growth strategy over the period 1936 – 2016. This value model was devised based on the three-factor model created by Fama and French.   From reviewing the above, it is evident that when the economy is strong value outperforms growth significantly. However, it is also clear that once the market experiences a shock and as economies are contracting growth gains ground or outperforms value.

The common factor in the in the above dips in value performance are market shocks, these events coincide with recessions. The Great Depression the Tech Bubble in the late nineties and the Global Financial Crisis in 2008, all lead to the Federal Reserve and the monetary authorities in the EU lowering interest rates.

Fama and French (1992) State value investments have been a source of outperformance historically and have experienced a drop in the cumulative value of their index three times in history. Marckowicz, (2018) these bear markets occurred in the 1930' Great Depression, the Technology bubble in 1990's and the Global Financial Crisis 2008. In each event the macroeconomic picture had been distorted by the manipulation of interest rates by monetary authorities. However, the action by central banks since 2008 has been extreme both in the length of time and in the action taken. The sluggish recovery from the Global Financial Crisis may be responsible for value investments underperformance.

Fama and French (2018) suggested that in a slow growing economy revenue growth is a rare commodity, as such investors place a premium on growth companies. This is highlighted specifically by the "FAANG" stocks (Facebook, Amazon, Apple, Netflix and Google).

Markowicz, (2018) the lack of revenue growth has motivated investors to place hope in companies with the capacity to achieve growth, specifically companies not overweight in any one jurisdiction. Pappas and Dickson, (2015) this shift in demand has altered the underlying mechanics of the value premium. Historically value investors take advantage of markets overreaction to recent events, which affect valuations in the short term. Webb (2015) outlines Richard Thaler's theory that investors are irrational and were incapable of making good decisions based on information.

Typically mean reversion occurs during the recovery period of a market shock. This "sweet spot" period did not occur post the 2008 Financial Crisis.

Concurrently monetary authorities have embarked on a historically high and sustained period of quantitative easing. Further depressing long term interest rates, when rates are cut future cash flows are valued at a lower discount rate. Fama and French, (1992) This in turn raises the present value of cashflows and as such the value of the business is increased. However, growth stocks unlike value stocks have a greater proportion of their cashflows occurring in the future as they are assumed to be grower at a higher rate. As a result of this growth stocks have benefited far more than value stocks from the low rate environment.

Resnick & Shoesmith, (2002) Describe how the yield curve, which is the measure of short and long term returns on sovereign debt. The yield curve shows that value outperforms when the curve steepens and do poorly once it flattens. One potential reason for this is that financial sector tends to be most sensitive to the idea that leverage and beta with the business cycle drive returns, which are fundamental characteristics of value stocks. Banking stocks typically thrive with a higher yield curve as the premium charge between borrowing short term and lending long term is at its highest.

Markowicz, (2018) However, the recent experience has favoured growth stocks as the yield curve has flattened extensively during the period 2009 – 2018. During this period long term yields fell as they had a greater sensitivity to inflation expectations and economic growths, when growth improved short term yields started to climb as investors priced in interest rates increases. Yet long term yields continued to fall because inflation expectations, as measured by the break – even inflation rate plummeted. This macroeconomic setting has disproportionality affected value stocks.

Yung Li, (2019) highlights that growth companies assets are intangible which in many cases are not captured in book value and retained earnings, making the usefulness of book value as an indicator questionable.

Strael and Ibbotson (2017) outline that another factor affecting the performance of value is share buy backs. Quantitative easing, which is the term given to the process of which monetary authorities increase the money supply in an economy. The FED and ECB increase their respective money supplies by 80bn a month, which was used in the purchasing of corporate debt.

This availability of cheap credit has fuelled a frenzy of share buy backs. Over the past 10 years, US companies have spent $4.2Trn on repurchases making them the largest consumer of equity's of US stocks. Company's favour this approach to dividends as it affords them greater flexibility and investors are attracted because by reducing the numerator (no. of shares in issue) the share price of a company is increased.

Consequently, this has hindered value stocks as dividend pay-out ratios have declined. Dividends are a key fundamental when analysing value stocks. Miller and Modigliani, (1961) suggest that investors should be indifferent about whether they receive via dividends or buybacks. However, as value investors hold their shares when a buyback is completed this increase in the per share value of the company. This also reduces the dividend yield and pay out, which is an important factor in the compound returns for value investors.

3.2 US Analysis

One of the first academic reviews of the usefulness of using accounting ratios was undertaken by Ou and Penman (1989). They looked at 69 accounting ratios related to earnings from 1965 and 1985. They used a measure which estimates the probability of revenue growth in the next calendar year. As

dividends in the future are reliant on revenues, a rise in revenues is associated with a rising share price. The authors divided the accounting ratios into two categories for the different time periods and focused on the most relevant indicators. Category A had 16 indicators and category B had 18 indicators, then a hypothetical zero investment long – short investment strategy was applied where by positions where assigned to 10 different portfolios according to their given composite value, with a holding period of 2 years. The two year holding period ensured that any survivorship bias was taken into consideration.

The authors findings showed that using the composite indicator as a measure of valuation, returns could be forecasted up to three years after initial portfolio construction, with any mispricing disappearing. Returns of buy and hold strategies totalled 12.5% and to 7.0% when adjusted for the company size effects.

These findings were disputed, as many academics argued that the data was sampled fit Greig (1992) and Richardson et al (2010). A solution to this issue was developed by Lev and Thiagarajan (1993) outlined 12 fundamentals that investors trust drive equity valuation. Their findings highlighted 10 of the 12 indicators to be statistically important and the adjusted returns of the fundamentals model is significantly greater than that of a standard expected returns model.

Academics have debated what the correct dependant variable in estimating coefficients for this type of valuation model may be. As outlined above Ou and Penman (1989) incorporated earnings, which was criticised as revenue/earnings is only indirectly related to stock price. Other academics like Larcker (1989) presented the idea of using directly related factors such as dividends and cash flows. Ou and Penman did have support for the use of earnings as the dependant variable for a fundamental based valuation method. Abarbanell and Bushee (1997) rational for using earnings was that this variable is correlated to economic variables that are a key component of all other variables, which could be used in a valuation model. This was outlined when they utilised 9 of the fundamental based indicators to construct an investing strategy. The strategy achieved significant returns 13.2%, which was over and above the market return. This was supported further by Lev and Thiagarajan (1993) , they highlighted how selecting a variables should be driven by the economic benefits and not by data selection.

3.3   The International Analysis
The literature examining the effect of accounting variables on equity returns in the United States is both deep and vast. The international research is quite sparse, this is not surprising as the financial centre of the world and the greatest academic institutions all reside there. Some literature on the topic includes Lewis (1989) found variances in the price behaviour of the London Stock Exchange (LSE) during the period 1956 – 1985. Strategies based on the above mentioned size effect and also strategies based on dividend yield, price-earnings ratios and market cap all followed trends of predictable profitability. Morgan and Thomas (1998) illustrated how stocks with high dividend yields exhibited higher risk adjusted returns.

Dimson et al (2003) regardless of size outlined a value premium in the UK market during the period 1955 -2001. This study again showed the dividend yield to be a reliable indicator of value for the following year. A deeper look at the returns of such strategies showed how after transaction costs returns can be much more normalised, Siganos (2012) showed during the period 1988 – 2009 based on seven individual return predictors that only returns based on earnings to price strategy was profitable after transaction costs where taking into account. In a more focused paper, Gregory et al (2013) illustrated that directors of companies in the United Kingdom achieved long-term above market returns when compared with a standard value glamour strategy between the periods 1986 – 2003.

The results did not define the term value, this would suggest that a contrarian strategy was adopted and directors sell growth investments and purchase value investments.

Spyrou and Kassimatis (2009) provided further supporting evidence of value premium in European Markets. The value premium is visible in certain years with very high returns, many years show no sign of excess returns for value investments. High minus low is the term coined by Fama and French's three factor pricing model. This refers to the spread between the returns on companies with high and low book to market values.

A study of 18 capital markets completed by Arshanapalli, Coggin and Doukas (1998), the analysis covered four different regions USA , Europe, Japan and Asia Pacific between the period 1975- 1995. The evidence highlighted a significant difference between low and high book to market stocks in 95% of the markets covered. In 2012 (Fama and French) completed an updated study on value premium in international markets. They highlighted patterns in returns in developed markets, supporting evidence from earlier studies.

4   Monetary Policy

Hoggarth, (1996) Defines monetary policy as the term given to the process by which a monetary authority of a country or institution in the case of the Eurozone, which controls the supply of money to manage inflation or sets the cost of borrowing through the setting of interest rates.

4.1   Academic Review of Investment and Monetary Policy

The academic inputs of the effect of monetary policy on the economy and investment markets is deep and extensive. Blaug (1996) outlines that it has influenced the seminal work of Adam Smith, who is credited with the invention of capitalism with the book the wealth of nations in the year 1700. David Ricardo is credited with a achieving a milestone in the 1800s when analysing economic principals. The next section will outline the key aspects of the relationship between monetary policy and capital markets.

The questions of whether Ricardo linked economic variables with investment has been further analysed by famous scholars, such as Karl Marx, John Stuart Mill and John Maynard Keynes among many others.

The Neoclassical theory of monetary policy Palley, (2007) was the leading school of thought up until the financial crisis in 2008. This theory outlines that monetary policy controls inflation through the manipulation of nominal interest rates, this in turn determines the growth of demand in an economy. As a result, monetary policy has an unintended effect on inflation, income distribution, equality and economic growth in the short run. The aim of monetary policy is to manage interest rates in the long term and control inflation and steadily grow the money supply.

However, academics have analysed the impact of macro factors on equity returns in the stock market. Spyrou and Kassaimtas (2009) identified real GDP and manufacturing output were key determinants of asset prices. The role of monetary factors on equity prices academics and economists have not been able to come to agreement. The Adam Smith definition of money as a medium of exchange and a store of value and that the neutrality of money assumed that it had no effect on the real economy. Brue & Grant (2013).

Friedman (1953) suggested that the role of monetary authorities was to provide liquidity to the economy and to oversee a sustainable growth to the money supply. Brue & Grant (2013) suggested this focus on the long run money neutrality ignored the short run effect on equity prices. Agritis, (2013)

outlined how financial policies can provide a significant influence on the value of a company's assets. Summarising that contractionary monetary policy negatively affect assets prices and expansionary monetary policy positively affects asset prices.

Agritis, (2013) outlines the importance of money has dramatically changed, it has now a much more pivotal role in capital markets since the 2008 financial crisis. The role of money since 2008 has highlighted the correlation between markets and the real economy. The role of the monetary authorities such as the European Central Bank and the Federal Reserve has broadened. The new role requires both parties to consider economic growth when deploying monetary policy. Another aspect of the new role is the obligation for oversight and regulatory authority over the entire financial sector. This is a significant expansion on the longstanding mission of maintaining the price level .i.e. managing inflation. Chen (2007) outlined that in this new world the most powerful tool is the setting of interest rates. The Federal Funds Rate in the US and the Marginal Lending Facility in the Eurozone.

An instrument known as the Federal Funds Future was developed from an academic study conducted by Bernanke and Kuttner (2003), who highlighted that that an unforeseen impacts of monetary policy or non-scheduled policy announcements have a serious impact on equity prices due to an alteration of the equity premium and a change in the cost of capital. The expectations communicated to the market with regard to interest rate changes had a significant impact on the stock market.

Argitis (2003) Outlines that the traditional view of a monetary authority is referred to as the new consensus model. Managing inflation, regulating the financial system and setting interest rates to cool down and heat up an economy. The academic support behind these views on central banking came from the neo Keynesian and neo-classical school of thought.

4.2   Money aggregate

Brue & Grant, (2013) defines the total quantity of money or the liquidity of the total transactions is the money aggregate. The proper liquidity is necessary to encourage the correct level of economic growth. Fisher concluded from his work that the supply of money affects the price level in an economy. By controlling the money supply the economy is also controlled. This hypothesis could be the rationale which central bankers had when implementing the quantitative easing program after the 2008 financial crash. The influx of cheap credit created by the Federal Reserve and ECB bond buying program which peaked at 80bn a month was intended to provide liquidity and maintain the price level. The idea was the liquidity would boost economic growth Gwilym, (2003).

Chen, (2007) completed research which has shown that changes in the money supply have a delayed effect on stock prices. Providing an opposing view Cooper, Pesando, and Rogalski and Vinso highlighted a gap between alterations to the monetary aggregate and changes in equity prices. The timing difference is the result of increased liquidity increasing the aggregate demand and in turn this affects the equity market. Increased demand results in revenue growth, whereas decreased demand results in falling revenue. There is strong academic research to support a correlation between monetary policy and investing. Chen (2007) emphasised the strong relationship between changes in monetary policy and the stock market. Highlighting that the effects on the stock market were greater than the effects to the real economy. For example tightening monetary policy lowers stock prices causes sell offs, which are worsened by behavioural influences. The real economy tightening policy has a more considered gradual effect on economic growth generally.

4.3   Interest Rates and Equity Prices

Brue & Grant (2013) outline how the great depression in the USA in 1929 caused central banks to rethink the quantitative theory of money. This was the beginning of policies such quantitative easing,

interest rate changes and the alteration of banks deposit reserve requirements. Bernanke and Blinder showed there is a distinct relationship between the Federal Reserve's main interest rate than any other monetary variable. Chen (2007) evidenced how the interest rate and equity prices had a positive correlation. The interest rates determine the cost of capital for investors and are the discount rates used in valuing companies. The aim of this research is to outline the effect of monetary policy on value investing in the US and EU the main rate used by the FED and ECB will be the best indicator.

Doh and Connolly (2013) the issue with analysing interest rates and equity prices is that the reason monetary authorities change interests rates are varied and are not completely motivated by the stability of the equity market. After the Financial crash in 2008 the FED adopted a lower zero bound philosophy on interest rates

Gwilym, (2003) highlighted an asset bubble in the year 2000 and in 2008, which is now known as the dot.com bubble and the global financial crisis respectively. Also noting that there is a relatively shallow research on the topic. Bernanke and Gertler (2001) highlighted how monetary policy does have an influence on asset prices. They created a model which showed that asset prices increased in value over time, eventually causing a bubble. Once this bubble ended the asset would revert back to their fundamental value.

Gwilym, (2003) raises the questions how should monetary authorities react to asset price movements and bubbles in general. The options are to deal with the aftermath of a bubble, which has burst the consequences being recession and unemployment. The second option is to and normalise the economy during a bubble and manage it down before a crash. Bernanke and Gilchrist (1994) argues that central banks should ignore bubbles and focus on managing the price level in an economy and meeting inflation expectations. Cecchetti et al opposed this view and stated that central banks should take action when it comes to bubbles.

Bernanke strongly criticised central banks for taking action during bubbles. His argument was that bubbles can be created by a number of factors including behavioural factors such as noise trading. Cecchetti found this distinction more difficult to determine when bubbles where caused by behavioural factors and economic activity. This made managing them during their growth a daunting task for policy makers.

Gwilym (2013) suggest that interest rates should be cut once a bubble bursts and a recession is in full affect. Lowering interest rates stimulates demand by encouraging investment and consumption, it also lowers the discount rate attributed to valuing assets and as a result increases there value. The current thinking on what action monetary authorities should take in the event of asset bubbles. Suggests that since equity prices are strongly correlated to economic indicators that central banks should consider asset prices when making policy decisions.

Blinder (2010) argues that a combination of systemic regulation, quantitative easing and interest rates changes should be used by central banks to manage asset bubbles.

Borys (2011) identified that some equities react differently to monetary policy changes. Characteristics of companies with a high sensitivity to monetary policy include, low levels of cash flows, small capitalisation and poor credit ratings. The effects of monetary policy on markets is different depending on the stage of the cycle. The study highlight show firms with low debt to equity and high P/E ratios are particularly affected by changes in monetary policy.

Chen (2007) outlined how monetary policy significantly affects asset prices during a downturn of more than twenty per cent. This is what is known as a bear market. Changes in the discount rate caused by interest rate increase or decreases had a greater impact on equity prices in a bear market.

The research also covers how different sectors and industries react differently to Thorbecke (2013) outlined that technology, cyclical consumer goods and telecommunications are affected more significantly than other sectors. Other industries which showed above average reactions were commodity producers and internationally produced goods.

5   Summary and Conclusion

There is a gap in the literature on the effect of monetary policy on value investments that this study aims to address. Value stocks are defined in this study as stocks with stable cash flows, low P/E and low book to market value. The above outlined research has identified that changes in monetary policy does have an impact on asset prices. Does this impact investment strategies that target fundamental value as outlined above? If so is the long held view that value investment is a safe reliable investment strategy that can be used by investors who have long term time horizons safely outdated. Or has the landscape changed and index tracking investments or investment concentrated on growth company's a better long term investment.

Economic theory and the problems with valuing an asset using any currently available models has led to the identification of factors which formulate an investor's expected rate of return. The required rate of return is comprised of two factors the risk free rate and the market risk premium. This highlights that there is a correlation between risk and return for every asset. CAPM was the breakthrough which highlighted this relationship for a particular investment. The assumption is that investors will consider the risk of each asset in their portfolio and how this relates to the risk of the entire portfolio. Chiarella et al, (2013) highlights that the CAPM expected return relationship with the market beta affect the expected risk premium for any single stock.

With this in mind I have analysed the factors which affect the risk of a specific investment highlighting in detail the research of the 1) value effect, 2) the price to earnings ratio and 3)the book equity to market ratio which are the main concern of this study. Agritis, (2013) supported the important point that any change in monetary policy has an effect on asset prices. The most significant affects arise with changes in the interest rate or through quantitative easing.

The empirical analysis of this study will be based on a model which will incorporate the above three factors along with interest rate changes using historical data. The research contributes to the current body of work by highlighting the effect of interest rate changes and the increase of the supply of money on value investments in the US and EU stock markets.

6   Research Question

The main research questions is:
- Has the post Global Financial Crisis monetary policy negatively affected value stocks in the EU and US equity markets?

Secondary research questions are:

- Are the conditions which have inhibited values performance over the last decade here to stay or are they a result of the low interest's rates?
- Do low interest rates disproportionately negatively affect value investments over growth investments?

The next section will examine the methodology taken throughout the research to attain the data to conduct an empirical analysis to understand the relationship between interest rates and value investing in the US and EU markets.

7   Methodology

This research aims to analyse the effect of post financial crisis monetary policy on value investments in the EU and US markets. The report adopts a quantitative analysis research method. This approach was designed on an ex post facto basis. Ex post facto basis was compatible with this study as the data was historical in nature and no intervention was required

The data is historic stock price and interest rate information, which is used to complete a number of statistical tests. The regression analysis is designed to take interest rates as the independent variable and stock prices as the dependant variable to estimate the relationship between the variables. A correlation is computed to again understand the significant of the relationship between the two variables. A number of other descriptive statistics are estimated to compare and contrast the relationship between the variables at different points in time. Excel 2016 data analysis tool was used to run the test which are outlined in detail below.

Regression analysis was appropriate for panel data, which again is historic data analysis. Therefore, the research design for this dissertation involved conducting regression analysis to examine the relationship between interest's rates and value investments.

This research may help investors understand the reason for value investments underperformance over the last decade. It may also aid investors in deciding what strategy should be undertaking in the future. Are the conditions which have inhibited values performance over the last decade here to stay or are they a result of the low interest's rates? As such will once interest rates return to historic averages will values historic outperformance be revived?

The report analyses' 19 years of stock and interest data for the period 2000 – 2019. From both the EU and US markets specifically focusing on the iShares S&P 500 and European value index. The interest rate data came from the Federal Reserve in the US and the ECB in the EU.

Rahamn (2016) outlines the advantages and disadvantages of both a qualitative and quantitative approaches to researchers. These methodologies are contrasting approaches and provide very different results. Strauss and Corbin (1990) define qualitative research as the type of research which produces results not discovered using statistics. It is best used when researching social topics such as people's opinions, emotions experiences. As such it has no statistical input and has multiple outcomes. Its uses nonstandard information to come to conclusions on topics.

As this study is based statistical information specifically historical equity and interest rates a qualitative approach was not compatible. Byrman (2012) defines quantitative research as "A research strategy that emphasis quantification in the collection of data" A limitation of the quantitative approach is outlined by Denzin & Lincoln (1998) suggesting that it fails to outline deeper meanings and explanations.

8   Regression

Rahamn (2016) Bivariate Regression is a statistical technique which can measure the relationship between a dependent and independent variable. The independent and dependant variable should be continuous. However, it is possible to include variables which branch into two parts. Regression aims to predict the value of the dependant variable. Furthermore it can estimate the significance of the

statistical relationship of the independent variable with the dependant variable. However it does rely on a number of assumptions.

8.1 The Assumptions

Rahamn (2016) Outliers can affect the accuracy of the findings and must be considered before conducting research. Sample size can cause sensitivity's for regression results, if the sample is small then this will inhibit the accuracy of the results. To accurately estimate regression coefficients, it is essential to have a large sample size. Another assumption is multicollinearity (correlation) makes the regression unreliable and can cause large standard errors. Variables have no requirement to be normal distributed, however regression assumes normality. The accuracy is increased if variables are normally distributed, however if variables are not normally distributed accuracy is diminished.

8.2 Biases in Regression

Nachimas & Nachimas (2008) Regression estimates the effect of *Y* due to the equivalent changes in *X*. Regression allows statistical inferences from one data set to the next. The hazards to the internal validity of regression are overlooked variable bias, sample selection bias, errors in variables bias, and simultaneous. Omitted variable bias persists if an omitted variable is determined by Y and correlated to one independent variable.

Trochim (2006) Outline that when an error with data measurement like data input errors then errors in variables bias occurs. The researcher can account for this by examining data to ensure accuracy and ensuring data is sufficiently measured. Practically this means cross checking the sample of data to various records. Sample selection bias is caused by random data selection, as such sample selection bias results in correlation between the independent and the error term. Concurrently causality bias is a bias which can be controlled by random selection.

8.3 Rationale for Methodology

The report examines the relationship between the dependant variables and independent variables by utilising an ex post facto design. Specifically ex facto design was chosen because the independent variables cannot be manipulated as such it is impossible to collect data through experimentation. Trochim (2006) the ex post facto design utilising existing data was the most compatible design for this research. This design is commonly used in various literature. Regression coefficient for testing variables is the most used method in the literature reviewed in this study.

8.4 Population

The target population for the study are publicly listed value investments which are constituents of the iShares S&P 500 Value index and Ishares European Value Index. The research examines the returns of the index in totality and also highlights key equities in each index. Sample size consideration is determined by sampling theory. This theory outlines sampling distributions parameters of the population. Each parameter has a unique sample distribution. Sampling distribution of the mean of the mean of a large population is normal and sampling distribution of correlation coefficient is the F distribution. The power of the test is the probability to reject the null hypothesis when it is in not true

8.5 Relevance of Research

Kim & Lee, (2008) Outline how capital markets have played a significant role in the economic production for the global economy. The financial system has become significantly more complex as economies have developed, this complexity was highlighted during the Global Financial crisis. In modern times all citizens of developed countries are participants of financial markets.

Among others pension funds, mutual funds and insurance companies invest cash into the stock market on a daily basis. To invest this cash investors, need to forecast expected return on any given equity and estimate the given risk of an investment. The demand for this market leads to the question how are equities valued. Berger, (2011) outlines how the academic consensus on how an asset should be valued is determined by three factors 1) the value of all future cash flows 2) the expected rate of return which is then used to calculate the present value of future cash flows 3) the time series of cash flows. Chen, (2007) highlight how the discount factor is determined by the interest rate environment and as outlined above this is key to determining asset prices.

Argitis (2013) outlines that Increasing interest rates lowers stock prices as the discount factor used when calculating the value of future cash flows is increased and vice versa. This has wide academic and practical support. This dissertation analyses this question and examines whether low interest rates affect all equities equally or does value stocks performance suffer more than others. Often viewed as the polar opposite growth stocks will be used as a measure.

Therefore, different assets are valued depending on their risk profile, their cost of capital and their varying cash flows. This leads to a variance in the expected rate of return. As such the measurement of risk and its relationship with expected returns is the foundation of all asset models. The aim of this study is to examine economic factors that influence these valuation models specifically monetary policy after the 2008 Financial Crisis.

This study defines value stocks by their accounting ratios, equities with low price to earnings ratio and book value to market value specifically. iShares S&P 500 Value Index defines value stocks with the same criteria. Graham and Dodd (1934) & Basu (1977) this is consistent with the academic consensus and market definition of value investments. Morgan and Thomas (1998) argue however other academics employ a broader definition which include ratios such price to cash flow and dividend yield.

The definition was decided upon as the S&P 500 value index has a complete historical price data set for value investments in the US for the period 1996 – 2019. This data will form the foundation for all statistical tests for the US portion of the report.

The analyses is based on the relationship between risk, return and macro variables specifically interest rates. Although other variables affect asset prices such as GDP and unemployment among others. I have chosen to focus on interest rates as these are particularly below historic averages over the last decade. The interest rate analysis will examine how changes in the FED Reserve rate and the main ECB marginal rate affect value investments.

Hypothesis 1

Ho: There is a relationship between the interest rate and value investments in the EU maket

H1: There is a no relationship between the interest rate and value investments in the EU market

Hypothesis 2

Ho: There is a relationship between the interest rate and value investments in the US market

H1: There is no relationship between the interest rate and value investments in the US market

Hypothesis 3

Ho: There is a more significant relationship between interest rates and value investments than interest rates and growth investments.

H1: There is not a more significant relationship between interest rates and value investments than interest rates and growth investments.

The next section will examine these results in details and discuss the significance of the results.

9 Findings and Discussion

This section will analyse the statistical tests outlined in detail in the methodology section, in summary this include descriptive statistics, correlation and regression analysis.

Statistics	Value Returns 00-19	Growth Returns 00-19	Interests Rate 00-19
Mean	0.02118%	0.023433%	1.69
Standard Error	0.0175%	0.01698%	0.03
Median	0.07%	0.06%	1.02
Mode	0.00%	0.00%	0.09
Standard Deviation	1.22%	1.18%	1.88
Sample Variance	0.01%	0.01%	3.53
Kurtosis	786.53%	702.77%	0.03
Skewness	-10.38%	1.03%	1.12
Range	19.98%	19.86%	6.82
Minimum	-9.27%	-9.26%	0.04
Maximum	10.70%	10.60%	6.86
Sum	102.29%	113.18%	9065.81
Count	4830	4830	5363

(Table 1: Descriptive analysis (00-19))

The above table, however, outlines the difference in returns over the period 2000-2019. This table is a comprehensive view as it includes a period of time of low interest rates since 2008. As mentioned during the literature review growth has indeed outperformed value over this period of time. The accumulative sum is 102.29% return for the value index. Whereas, growths accumulative return is 113.18% over the same timeframe. The average interest rate for this given of time is 1.69%.

Statistics	Value Return 08-19	Growth Returns 08-19	Interests Rates 08-19
Mean	0.023%	0.04%	0.922165605
Standard Error	0.024%	0.02%	0.023655621
Median	0.063%	0.08%	0.18
Mode	0.000%	0.00%	0.09
Standard Deviation	1.289%	1.20%	1.390258379
Sample Variance	0.017%	0.01%	1.932818361
Kurtosis	921.755%	929.43%	3.072936274
Skewness	-17.417%	-15.11%	1.987711243
Range	19.979%	19.86%	5.37
Minimum	-9.274%	-9.26%	0.04
Maximum	10.704%	10.60%	5.41
Sum	66.790%	116.24%	3185.16
Count	2921	2921	3454

(Table 2: Descriptive Analysis (08 – 19))

Table 2 is a more focused look at value returns at a point in time when the average interest rate is 0.92%. At this lower interest rate the accumulative returns for value is 66.79%. However, the return for growth in the same time frame with this lower interest rate is 116.24%. The contrast between the statistics suggest that low interest rates may be a factor in values underperformance over the period. However, the question remains whether this is the only determinant of the underperformance.

Correlation; was used to understand the strength of the relationship between the two variables.

Value Returns	1	-0.02626
Interest Rates	-0.02626	1

(Table 3: Relationship between the variables)

| Correlation <.20	Weak Correlation
Correlation >0.2, <0.5	Moderate Correlation
Correlation >0.5 up to 1	Strong Relation

(Table 4: Correlation Measures)

Table 3 outlined above illustrates that there is a negative weak correlation between interest rates and value stocks. Because its value us less than 0.20, which is an indicator of weak regression.

9.1 Regression Analysis

The below tests show regression between the dependant (returns) and the independent variable (interest rates). Regression includes factors such as Multiple R, Adjusted R square, Standard Error, and Number of observations, P – Value, T-Stat, Coefficient and significance F. R square allows us to know the proportion of variation that is explained by self – sufficient variables. Coefficient shows the change in the dependant variable with change of 1 unit in the independent variables. If the significance F is less than or equal to 0.05 than it is significant and if It is greater than 0.05 then it is in significant.

9.2 Value and Interest Rates

Value Returns and IR Residiual Plot 00-19
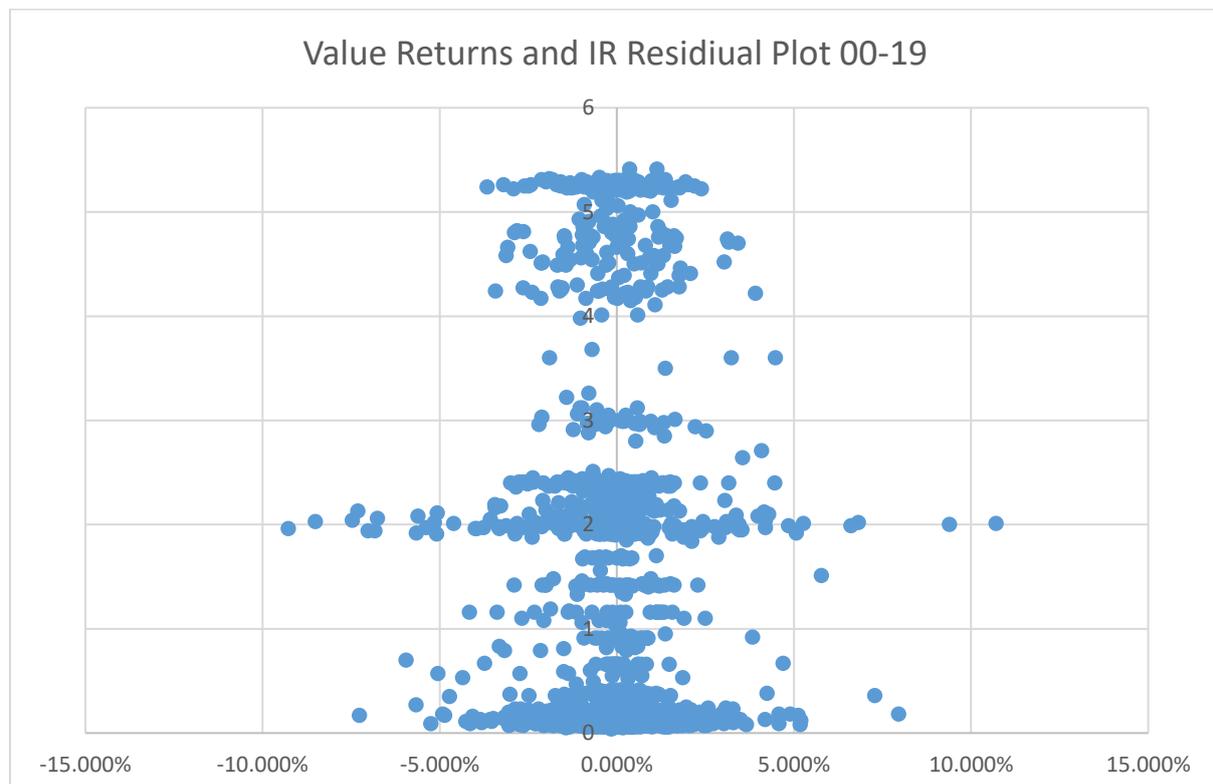
(Figure 2)

Figure 2 outlines the variance of the daily return of value for a given interest rate for the period 2000-2019. The horizontal X axis depicts value investment returns and the horizontal access is he given interest rate.

SUMMARY OUTPUT	
Regression Statistics	Percentage
Multiple R	2.54%
R Square	0.06%
Adjusted R Square	0.03%
Standard Error	1.27%
Observations	3171

(Table 5)

ANOVA	df	SS	MS	F	Significance F
Regression	1	0.000330962	0.000331	2.039863	0.153322013
Residual	3169	0.514161385	0.000162		
Total	3170	0.514492347			

(Table 6)

Variables	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.000422444	0.00027045	1.562003	0.1183871	-0.0001	0.00095	-0.01%	0.001
X Variable 1	-0.000212695	0.000148921	-1.4282376	0.153322	-0.0005	0.008%	-0.05%	0.01%

(Table 7)

The R square, as it is regression of value returns on the index and interest rates of a twenty-year period on a daily basis. The test calculated R square at the value 0.06% which mean 0.06% of the variance in value returns on a daily basis is explained by changes in interest rates. The value of Multiple R, adjusted R square and standard error are 2.54%, 0.03%, 1.27% respectively.

The value of significance F is greater than 0.05 so statistically we can say the relationship is insignificant. Coefficient show the change occurs in the dependant variable with the 1 unit change in independent variable. In this regard 1 unit change in interest rate represents 0.04% change in the index price. P value is also greater than 0.05 illustrates a weak relationship between interest rates and value returns.

9.3 Growth and Interest Rates

Growth Returns & IR Residiual 00-19
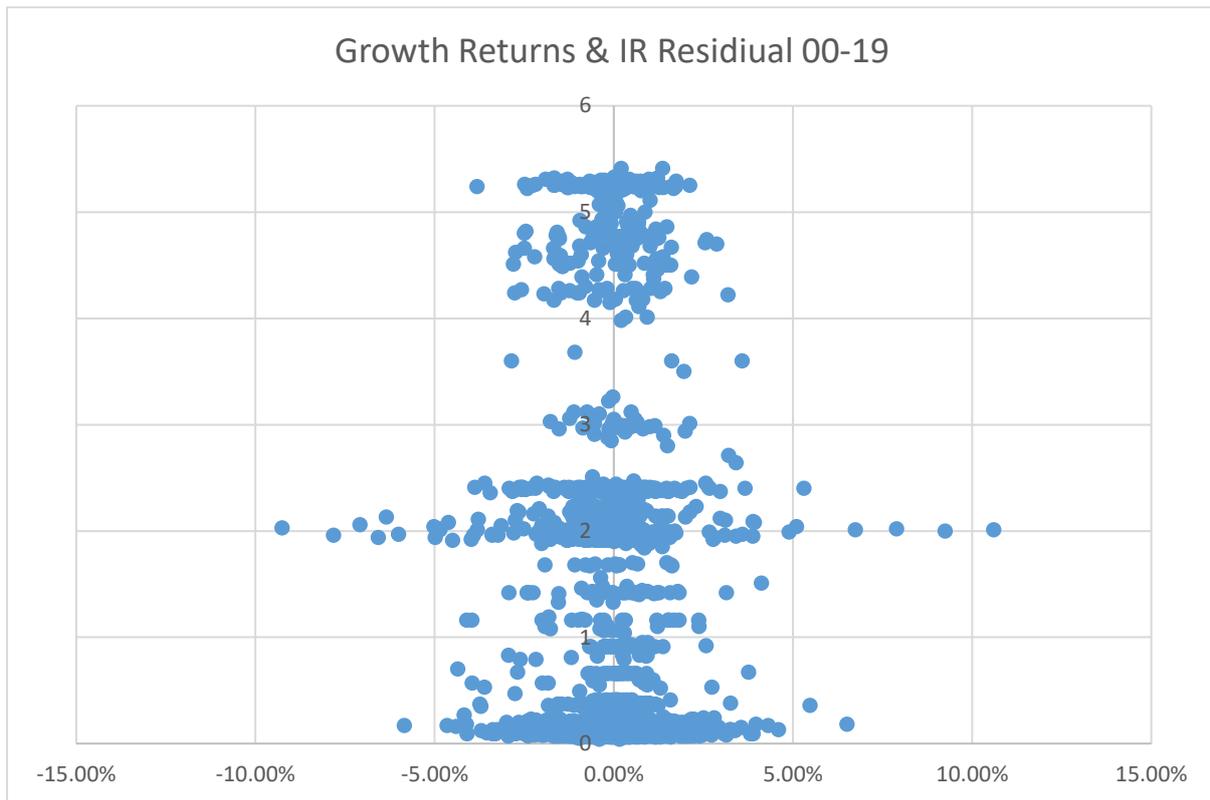
(Figure 3)

Figure 2 outlines the variance of the daily return of growth for a given interest rate for the period 2000-2019. The horizontal X axis depicts value investment returns and the horizontal access is he given interest rate.

Regression Statistics	Percentage
Multiple R	2.10%
R Square	0.04%
Adjusted R Square	0.01%
Standard Error	1.18%
Observations	3171

(Table 8)

ANOVA	df	SS	MS	F	Significance F
Regression	1	0.0002	0.000194	1.403816	0.236174596
Residual	3169	0.4391	0.000139		
Total	3170	0.4393			

(Table 9)

Identifiers	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.055%	0.00025	2.2198246	0.0265012	0.00648%	0.10448%	0.00648%	0.10448%
X Variable 1	-0.000163051	0.00014	-1.1848273	0.2361746	-0.04329%	0.01068%	-0.04329%	0.01068%

(Table 10)

The R square, as it is regression of value returns on the index and interest rates of a twenty-year period on a daily basis. The test calculated R square at the value 0.04% which mean 0.04% of the variance in growth returns on a daily basis is explained by changes in interest rates. The value of Multiple R, adjusted R square and standard error are 2.10%, 0.01%, 1.18% respectively.

The value of significance F is greater than 0.05 so statistically we can say the relationship is insignificant. Coefficient show the change occurs in the dependant variable with the 1 unit change in independent variable. In this regard 1 unit change in interest rate represents 0.055% change in the index price. P value is also greater than 0.05 illustrates a weak relationship between interest rates and growth returns.

The statistical test completed above fail to highlight a significant relationship between interest rates on either value or growth returns in the US for the period 2000 – 2019. However, the R square test ad F test show a less significant negative relationship between interest rates and growth returns than value returns.

Descriptive Statistics	IR 00-19	IR 08-19	IR 08-15
Mean	1.777093299	0.922165605	0.355%
Standard Error	0.026376379	0.023655621	0.015%
Median	1.06	0.18	0.130%
Mode	0.09	0.09	0.090%
Standard Deviation	1.952030265	1.390258379	0.702%
Sample Variance	3.810422156	1.932818361	0.005%
Range	6.82	5.37	4.230%
Minimum	0.04	0.04	0.040%
Maximum	6.86	5.41	4.270%
Sum	9733.14	3185.16	8.0739
Count	5477	3454	2276

(Table 11 Interest Rates)

9.4   Analyse of Low Interest Rate Environment

Companies	BKR	JPM	P&G	J&J	AT&T	BAC	GE	Intel	Citi	Wal	MCD
Mean	0.05%	0.04%	0.01%	0.04%	0.02%	-0.01%	-0.05%	0.05%	0.03%	0.01%	0.04%
Standard Error	0.03%	0.05%	0.03%	0.03%	0.03%	0.07%	0.04%	0.04%	0.06%	0.03%	0.03%
Median	0.01%	0.05%	-0.02%	0.03%	0.07%	0.00%	-0.05%	0.04%	0.00%	0.04%	0.07%
Mode	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Standard Deviation	1.17%	1.70%	1.21%	0.91%	0.99%	2.31%	1.35%	1.47%	2.12%	1.02%	0.96%
Sample Variance	0.01%	0.03%	0.01%	0.01%	0.01%	0.05%	0.02%	0.02%	0.04%	0.01%	0.01%
Minimum	-7.31%	-9.41%	-6.19%	-3.27%	-5.03%	-25.50%	-10.80%	-6.31%	-16.42%	-10.04%	-4.46%
Maximum	9.42%	8.44%	5.52%	5.38%	4.17%	14.34%	6.54%	9.27%	13.85%	4.72%	8.12%
Sum	57.12%	55.97%	13.00%	52.19%	20.87%	-18.41%	-63.27%	62.40%	32.60%	18.46%	48.65%
Count	1258	1258	1258	1258	1258	1258	1258	1258	1258	1258	1258

(Table 12 Value Returns 11-15)

Table 12 outlines the descriptive statistics of the daily returns for value returns for the period 2011 - 2015, this period was selected as it represents a period of historically low interest rates of 0.35%. The above table is select group of the iShares Value index companies, which represent 25% of the entire

benchmark. When analysed in conjunction with table 11 and 13 below it can be seen that the average return for the majority of these companies is lower than in times of higher interest rates. The cumulative returns for this period are lower on average as a result. The findings are limited as the cause for this relatively poor performance cannot be solely attributed to interest rates. Consideration must be given to macroeconomic picture of the time, which saw a major recession and massive decrease in consumption in the economy.

9.5 Comprehensive view of the Interest Rate Environment

Companies	BKR	JPM	P&G	J&J	AT&T	BAC	GE	Intel	Citi	Wal	MCD
Mean	0.05%	0.06%	0.04%	0.04%	0.02%	-0.03%	-0.01%	0.06%	0.04%	0.05%	0.05%
Standard Error	0.02%	0.03%	0.02%	0.02%	0.02%	0.04%	0.02%	0.03%	0.04%	0.02%	0.02%
Median	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	0.05%	0.00%	0.03%	0.05%
Mode	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Standard Deviation	1.42%	2.41%	1.41%	1.29%	1.67%	2.81%	1.92%	2.38%	2.98%	1.62%	1.50%
Sample Variance	0.02%	0.06%	0.02%	0.02%	0.03%	0.08%	0.04%	0.06%	0.09%	0.03%	0.02%
Range	30.21%	45.82%	40.45%	28.07%	28.94%	66.86%	32.49%	42.16%	96.85%	21.26%	23.68%
Minimum	-10.94%	-20.73%	-30.24%	-15.85%	-12.66%	-40.78%	-19.70%	-22.03%	-39.02%	-10.18%	-12.82%
Maximum	19.26%	25.10%	10.21%	12.23%	16.28%	26.07%	12.79%	20.12%	57.82%	11.07%	10.86%
Sum	276%	345%	230%	232%	98%	-181%	-88%	354%	217%	300%	291%
Count	5850	5939	5939	5939	5939	5939	5939	5939	5939	5939	5939

(Table 13 Value Returns 00-19)

Table 13 provides a comprehensive over view of a selected basket of value stocks returns over the period 2000 -2019.

10 Summary of Findings and Discussion.

In the tables and graphs above the reader can find the composition of returns of the iShares S&P 500 Value index and European Value Index. Additionally, the information compiled also examines interest rates returns, iShares Growth index returns and a special basket of stocks from the indices.

The tables and graphs were constructed with the purposes of allowing the reader to analyse the stocks at points in time where interest rates were at historic norms and also at times when there were far below historic averages. The tables and graphs illustrate a picture of different return environments and allow the reader the information necessary to suggest that conditions of low interest rates have a more acute affect on value investments than the market and specifically growth stocks.

The hypothesis which were presented above can now be analysed and considered in more detail. I believe we can fail to reject the null hypothesis and say there is a relationship between interest rates and value returns in both the US and EU markets. This is supported by the literature where there is consensus among academics that interest rates affect asset prices. The research is limited in it ability to extensively address the third research questions. However, it can be seen that there is a slightly more significant relationship between interest rates and value than growth. In this instance we also fail to reject this hypothesis.

This literature has extensively researched the effect of interest rates on asset prices across most major market places. However, there appears to be a gap in the literature specifically concerning the

relationship between value investments and the low interest rate environment. This research may contribute to this area.

The limitations of this study include, the sample size available to analyse the historic low rates is less than a decade old. As such the depth of data may not be sufficient to extract concrete findings as to the determinants of values underperformance. Studies mentioned in the review such as Lewis (1989) 1956 – 1985 or Fama & French (2006) 1963 -2004 examine the returns attributed to different factors over a much broader timeframe. As such their results are statistically more significant.

The study also researches one variable interest rates as the determinant for values underperformance. This excludes other factors such as risk, business cycle and technology. Value investments tend to be consumer stables, utilities and financials. These sectors all have key determinates of success outside of interest rates which may have attributed to values underperformance in the period.

Markowics, (2018) outlined that these industries have experienced headwinds such as the financial crisis and the bailout which followed, reducing financial revenues for a sustained period. Technological disruption to the consumer staples sector with the rise of online shopping. Yung li, (2019) Technology has disrupted" moats that used to exist around certain industries which protected value investments. Bernstein, (2019) outlines how Amazon has destroyed moats which used to protect retail sector earnings this in turn has eliminated mean reversion for these companies share prices.   Finally, the sustained low energy prices which have arisen due to the increase in production of natural gas and oil. This may also have led to the underperformance of value in the last twenty years.

However, it must be given further consideration as the popularity of the investment strategy suggests many individual investors are exposed to any weakness in the framework going forward. As such the research presented above may contribute too many building blocks which will be required to provide a robust analysis of the determinants of value and how these factors will achieve investment returns in the future.

The final section of the research will provide a summary of the salient points taken from the research. The aim is to provide the reader with view of the key findings.

11 Conclusion

In this section the empirical findings and the academic literature are combined to answer the main research question and its sub questions. The main question will be addressed first and followed by the sub questions. For the readers convenience the questions are stated once more with a conclusion comment following.

- Has the post Global Financial Crisis monetary policy negatively affected value stocks in the EU and US equity markets?

The empirical results concluded there is an insignificant relationship between interest rates and value returns. However, the descriptive statistics specifically the average returns for value investments in times of low interest rate and high interest rates, suggest there may be a negative relationship between low interest rates and value returns. The majority of the theory suggests this is true, the efficient market hypothesis states that no value premium should exist and low interest rates cannot predict future price performance.

However, as outlined above markets may not be efficient and the evidence for a value premium is strong in both the US and EU markets. As such the returns for the strategy are effected by interest rates, as interest rates affect all valuations. I believe the academic theory supports the view that ultra-

low interest rates implemented post 2008 Financial Crisis have been a key determinant to its underperformance.

Interest rates are just one factor in this underperformance, technology and the disruption of sectors such as the finance, technology and consumer stables can put forward as arguments to explain the recent underperformance of value. However, the evidence suggest that if the yield curve steepens and interest rates increase value investments will be in a position to achieve higher returns. Therefore, it can be suggested that the post Global Financial crisis monetary policy did negatively affect value investments.

- Are the conditions which have inhibited values performance over the last decade here to stay or are they a result of the low interest's rates?

The empirical results highlighted that since 2008 there has been an interest rate environment, which has contributed to values underperformance. The theoretical research supported the view that low interest rates inhibit value returns. The low interest rate environment which was implemented post Financial Crisis and the concurrent quantitative easing which accompanied it have been in place for nearly a decade. As outlined in the literature review Smith, (2019) predicts the Federal Reserve will lower interest rates five times by 2020 and Europe is already at almost 0%. As such the interest environment is more likely to worsen for value investors rather than improve. Until the yield curve steepens and interest rates are increased the conditions which have inhibited values performance will persist.

- Do low interest rates disproportionately negatively affect value investments over growth investments?

The empirical results showed a slight lower negative relationship between growth and interest rates than value and interest rates. This suggests that interest rates may disproportionality affect value investments over growth. The academic literature supports this view, low interest rates support companies which do not rely on cash flows for valuation. As growth companies have a larger proportion of their cash flows occurring in the future as a higher annual growth rate is assumed. Why would an investor invest in a company like JP Morgan or Johnson and Johnson when they could purchase an Amazon or a Netflix as a result of their recent performance? This demand for growth also drives price and is supported by the high valuations given to companies in part because of their low cost of capital.

This research suggest that the low interest rate environment brought about by the Global Financial Crisis in 2008 has led to an investment market where the determinates of value returns are inhibited. These may not be the only factor but as past research highlights at times of low interest rates. Such as the Great Depression, Tech Bubble and Global Financial Crisis, value underperforms.

Further research is required on a broader data set to determine the significance of this relationship. The research also suggest that if monetary policy is normalised too historic averages value may be positioned for a return to its historic outperformance. As value investments are currently trading at historic discounts it may be a key time in the cycle to gain exposure.

Appendix 1.

Author	Year	Research Area	Period	Indicators	Conclusion
Fama, French	1998	US, Japan, UK, France, Germany, Italy, Netherlands, Belgium, Switzerland, Sweden, Australia, Hong Kong, Singapore	1974-1994	B/M , P/E , P/CF , DY	Value stocks tend to have higher returns than growth stocks in markets around the world for each of the mentioned indicators
Levis, Liodakis	1999	United Kingdom	1968-1997	B/M	Value stocks did outperform growth stocks
Gonenc, Karan	2003	Turkey	1993-1998	B/M, size	There is no value premium on the Istanbul Stock Exchange. Neither value nor growth stocks manage to outperform the market
Michou	2009	United Kingdom	1975-2006	B/M,Size	The value spread is not a good predictor of stock returns. There is some predictive power among small stocks, but none among large stocks
Spyrou, Kassimatis	2009	Austria, Denmark, France, Germany, Greece, Ireland, Italy, Netherlands, Spain, Sweden, Switzerland, UK	1982-2005	B/M	The value premium is strong on average, but the outperformance of value stocks is significant only in a few occasions
Arisoy	2010	France	1997-2007	B/M , P/E , P/CF , DY	The value stocks outperform growth stocks in good times, but they lose more during bad times
Fama, French	2012	North America, Europa, Japan (23 countries, not specifically mentioned)	1989-2001	B/M , Size	Value premiums were found in each of the four regions. When taking size into account, the value premium is larger for small stocks in all countries except Japan

Author	Year	Research Area	Period	Indicators	Conclusion
Chan, Lakonishok					
Capaul, Rowley, Sharpe	1993	France, Germany, Switzerland, UK, Japan, US	1981-1992	P/B	Value stocks provided superior risk-adjusted performance in each of the researched countries. However, it is not clear what causes the outperformance.
Arshanapalli, Coggins, Doukas	1998	US, Canada, Austria, Belgium, Denmark, France, Germany, UK, Netherlands, Norway, Spain, Sweden, Switzerland, Australia, Hong Kong, Japan, Malaysia, Singapore	1975-1995	B/M	The results show the superiority of value stocks compared to growth stocks during the period 1975 till 1995. Size and book-to market ratio both have a predictive value in future returns.
Chen, Zhang	1998	US, Japan, Hong Kong, Malaysia, Taiwan and Thailand	1970-1993	B/M , DY , Size	Strong value stock effects persist in the U.S, but Japan, Hong and Malaysia markets show less value investing advantage. In Taiwan and Thailand the benefits of value investing are undetectable
Bauman, Conover,Miller	1998	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Italy, Japan, Malaysia, Netherlands, Norway, Singapore, Spain, Sweden, Switzerland, UK	1985-1996	B/M , P/E , P/CF , DY	Value stocks generally outperform growth stocks, but in some years value stocks did underperform.

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