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A strategic and systematic approach to quality investing strategies

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Abstract
This comprehensive research study aims to highlight the origin of quality investing and to identify the measures used as a proxy for quality investing in the past. This study evaluated the performance of these quality measures in different markets and found them significant. Among these quality investing measures, F_Score and Gross profitability were found to be outperforming the market and other quality measures. Most of the studies on quality investing were concentrated in North America and Europe. Further, this study identifies areas explored in the field of quality investing and addresses potential research gaps that can be endeavoured by future researchers.

Keywords: Quality investing, quality premium, quality measure, F_Score, gross profitability

Introduction
One of the most prominent theories in Finance during the seventies was the "Efficient Market Theory" (Ang *et al*., 2011; Degutis & Novickytė, 2014; Fama, 1970) [2, 13, 14]. This theory was given for the first time by E. Fama, and this theory propounds that the market is efficient and absorbs all the information available in the public or non-public domain into the security prices (Fama, 1970) [14]. Thus, every security trades at its fair value in the market, and no one can gain any abnormal return from the market, and only average returns can be drawn. If investors want to generate higher returns compared to the market, they will have to bear the risk of investing in risky assets (Bernard *et al*., 1997; Fama & French, 1993; Sharpe, 1964) [7, 16, 40]. However, this theory gained criticism in the 90s from many researchers and academicians as many anomalies emerged. Several anomalies have shattered the myth of an efficient market and proved that it can generate abnormal returns (Jiang, 2022; X. Zhang *et al*., 2023) [25, 52]. These anomalies are related to fundamentals, price action, and investor sentiments. One of those anomalies is investing through quality stocks, which is known as quality investing. Quality investing is about investing in quality stocks, but the meaning of the word quality in the case of equity investing is vague (Hsu *et al*., 2017; Ung *et al*., 2014) [23, 47]. Different contexts have been used to define quality (Asness *et al*., 2019) [3]. Some academicians define quality as micro factors related to stocks, while many others refer to quality as the macro factor associated with the market, i.e., industry and economy (Jiang, 2022; Joyce & Mayer, 2012) [25, 26].

Various measures qualify as quality metrics for investing in the equity market, some of which are classified as micro in nature and some of which are macro. Some other classifications, such as financial and non-financial quality metrics, may also be construed for the division of quality measures to qualify the stocks for quality investing. Non-financial fundamental measures are difficult to trace for retail investors as the information is limited to insiders only. Several strategies based on fundamental and non-fundamental measures have proved themselves to be the source of quality investing. F_Score, Novy Marx's Gross Profitability, Mohanram's G Score, Sloan's Accrual, Q Score, B-Score, etc., are the investing strategies that are based on accounting and fundamental information and have outperformed the different markets across the world over the different period (Mohanram, 2005; Novy-Marx, 2013; Piotroski, 2000) [30, 34, 35]. This research is specifically designed to focus on quality measures, which can be classified as financial quality measures and are micro. The study is descriptive and begins with a detailed analysis of the literature available on quality investing to identify the trends and performance of different quality strategies in Indian and overseas markets.

Objectives of the Study

The main objective of this study is

- To identify the strategies that emerged as quality investing in recent years and how they have performed.
- To know the geographical distribution of the studies conducted on quality investing.
- What research gaps can future researchers in the field of quality investing address?

Research Methodology

The present study follows a descriptive and narrative approach to highlight the strategies that have been proposed as quality and shown improved results as compared to traditional ones. We have extracted 218 research papers that were directly or indirectly using strategies associated with quality investing. Google Sheets, etc., were used to construct the network and generate the organization's geographical concentration, respectively contributing to the field of the study. Using bibliometric data, three clusters were identified. A thorough content analysis of the research papers in each cluster was done to identify the subthemes and establish the relation between them. To maintain the quality, we analysed 72 research papers from the different clusters which were published in A* or A-rated journals.

Content Analysis

Researchers have shown interest in quality investing after the publication of "Gross Profitability; The Other Side of Value" by Novy Marx. After this article, exponential growth has been recorded in publications on quality investing. Zaremba A., Pedersen LH, and Lee CMC are among the top authors who have addressed the issue of quality investing and motivated other academicians to show interest in this field.

Cluster 1: Accounting Measures and Stock Market Performance: Exploring Fundamental Signals and Mispricing

The first cluster focuses on the fundamentals lying in financial statements, which signal future performance. The earliest paper in this cluster was by Sloan (1996) [43], where he found that the investor prefers the cash com23ponent over accruals. (Charitou & Panagiotides, 1999; Wahlen & Wieland, 2011) [1, 12, 48]. Taylor and Wong (2012) [45]. Found that the returns to accrual-based trading strategies are not as robust as previously advocated and are sensitive to research design. So, investors should adopt a comprehensive fundamental analysis instead of using individual signals to invest their money (Jiang, 2022) [25]. Most authors used cash flows, accruals, and earnings accounting measures to design the portfolios (Abarbanell & Bushee, 1998; Charitou & Panagiotides, 1999; Novy-Marx, 2013; Piotroski, 2000) [1, 12, 34]. While the rest of them have used B/P, P/E, PEG, Profitability, Earning Surprise, ROA, ROE, Sales Growth, etc. as fundamental signals to invest, and confirmed the efficacy of these fundamental signals at generating good returns at lower risk (Bernard *et al*., 1997; Wahlen & Wieland, 2011; L. U. Zhang, 2005) [7, 48, 51]. One major finding is that most of the returns are accumulated around the earnings announcement.

Rreturns to the fundamental signals are not always due to mispricing or due to the risk involved in it. Barnard *et al*. (1997) [54] evaluated the six accounting anomalies on different criteria whether their returns were resultant of the mispricing of securities or were the reward against the higher risk taken by the investor. They found that earnings based on momentum were due to mispricing, while others had a risk-based return explanation except for price momentum, whose results suggested it to be a mixed one. Realdon (2013) [37]. Found that credit and default risk create pressure on B/M and P/E ratios; thus, a portion of abnormal returns on these strategies are the result of credit risk. One major source or explanation of these returns was the under-reaction to public information. Conditional performance prevails when the sentiments of investors are quite high, as the investors usually overreact to the fundamentals, and returns show a reversal in a shorter period (Zhu *et al*., 2019) [53]. Some of the fundamental signals might have a seasonal performance, as Zhang (2005) [51] found that the firms with low P/B ratios have higher returns than firms with high P/B ratios and that the value premium is larger in bad times as compared to good times (Turtle & Wang, 2017) [46]. Quality of accounting and price adjustment delay have a negative relation (Callen *et al*., 2013) [10]. One more interesting fact that came to light is that big and influential market players anticipate the fundamental changes earlier as compared to general investors and respond early in the market but are still not able to exhaust all the available information in the public domain (Wahlen & Wieland, 2011) [48].

Cluster 2: Quality investing strategies based on fundamental and non-fundamental measures and their performance in the market.

Piotroski (2000) [35] has developed a quality strategy known as F-Score based on nine accounting signals that have accelerated the performance of book-to-market value and generated return of 23 % on an annual basis. Further, this strategy has traces in various economies, some of which are emerging in nature while others are developing or developed. This strategy has generated significant returns across the countries and time consistently and improved the power of other value measures when used in aggregation (Hyde, 2018; Safdar, 2016; Singh & Kaur, 2015) [25, 38, 41]. In contrast, Kim and Lee (2014) [27]. Have criticized this by saying that these returns are specific to the return accumulation period and thus do not have any practical implications. On the other hand, Safdar (2018) [38]. Has stated that the performance of F-Score is high in less competitive industries as compared to the highly competitive industry, and he concluded that degree in industry competition also has an important bearing on the efficiency of the strategy based on fundamentals.

G-Score is a quality strategy based on eight fundamental signals that have gained positive returns in all 21 years considered for the study, and it also proved that it could be used as a return accelerator to other fundamental measures (Mohanram, 2005) [30]. Shen and Yan (2014) [42]. Proposed improvement over Mohanram's G-score with the help of integrating experts' assistance for the determination of the glamour stock. Stocks were outperforming according to their rank as per improved G-Score for 32-month and 44-month holding periods. Piotroski (2005) [36]. Critically examined Mohanram (2000) and found that the real strength of the G-Score index is the underperformance of the

glamour stock in the market. He also concluded that F-Score (Piotroski, 2000) [27] was competent in finding the positions on both sides, while G-Score was able to find well only the short side. Another interesting finding was that the G-Score's post-earnings announcement performance was opposite to its annual performance. BSCORE, developed by Mohanram *et al*. (2018) [31], also gave another composite measure named BSCORE which has covered the banking and financial stocks which are usually excluded by studies due to their financial background. A long-short strategy has given a significant return, which was formulated based on the BSCORE. Found gross profitability as the most powerful predictor as it subsumes the power of other variables. He also found the presence of hedge capability in combining gross profitability with value strategy, which could generate higher profit at lower risk as compared to their performance and make it perform in any kind of market. Ball *et al*. (2014) [5]. Found an improvement in the performance when they considered gross profitability measured by current expenses against the current income. Actively managed institutional investors such as FIIs, DIIs were found to be more concerned about the quality of stock while deciding their portfolio as these strategies outperformed the various markets, and this fact has been well supported by evidence in five Asian markets (Ng & Shen, 2020) [32].

Frankel & Lee (1998) [19]. Developed and analyzed the analyst's fundamental value to price model and residual income model to track the efficiency of the market and performance of the strategy. They found it has significant predictive power same as the B/M ratio, and it can be enhanced by removing the predictive errors found therein. Beneish *et al*. (2001) [8] used contextual fundamental analysis on growth stocks which involves the two-stage process of sorting firstly on market variables and afterwards using accounting variables to identify the potential winners and losers. Beneish (2001) [8] has used an earning manipulation model M-Score for the prediction of expected future returns. This earning manipulation model gets its predictive power from the accruals, i.e., quality of earnings. This model proved its efficiency in predicting future returns as well as fraud detection in companies. Gallagher *et al*. (2014a) and Gallagher *et al*. (2014b) [20, 21] used fundamental signals and developed a quality measure named Q Score and found it able to generate a significant return in the US and Australia even in a stressed market. Bartram and Grinblatt (2018) [6] used a statistical approach to estimate the fair value and rank them based on their estimated mispricing and trade accordingly. The author found that this approach can generate significant returns over time.

Leippold & Rueegg (2018) [28]. Have compared the performance of two forms of style investing, i.e., integrated approach and mixed approach. Assness *et al*. (2019) [3]. Used the approach of "quality minus junk," where they removed the junk companies from the portfolio constructed based on size anomaly. The authors found that after controlling for junk, the authors find that size effect is much stronger and more stable even market is under stress.

Cluster 3: Non-fundamental Anomalies in Financial Markets: Exploring Low-Risk Strategies and Performance

The third cluster is focused on low-risk investing, i.e., a market-related non-fundamental quality measure for investing. Generally, financial theories say that there is a positive relationship between risk and return, but it's not true. These financial theories follow the CAPM model, which assumes that there is a linear relationship between risk and returns, but there are several studies that oppose the same (Fama & French, 1992) [15]. This gives a platform to an investing style that claims to focus on reducing risk instead of maximizing return, i.e., low-risk investing. A low-risk strategy is an investment approach that seeks to minimize the potential for losses while still generating a reasonable return. Various measures can be taken as a proxy for low-risk investing, such as low beta, low volatility, higher liquidity, etc. The earliest paper in this cluster is by Walkshausl (2014) [49] argues that low-risk investing can provide investors with higher returns at lower risk along with diversification. Further, the risk-adjusted performance of his low-risk strategies was significant and equally beneficial worldwide. Baker *et al*. (2014) [4]. Decomposed the low-risk anomaly into micro and macro components. The findings suggest that managed-volatility portfolios can be constructed by overweighting low-beta stocks and underweighting high-beta stocks. This strategy can help investors to reduce risk without sacrificing returns.

Many academic studies witnessed the performance of portfolios constructed based on low-beta, low volatility, and other low-risk measures with the ability to generate a significant return (Schneider *et al*., 2020; Zaremba *et al*., 2018). Blitz *et al*. (2020) [39, 50, 9]. Marked the presence of the effectiveness of the low-risk approach for quite a long in the recent past across all major stock markets, market regimes and in other asset classes. Fan *et al*. (2022) [17]. Investigated the relationship between equity tail risk and currency risk premiums and found that currencies that are more exposed to global equity tail risk tend to have lower risk premiums. This can be a suitable basis for designing a strategy to invest in international currencies. Luo (2022) [29]. Examines the relationship between environmental, social, and governance (ESG) factors and stock returns, liquidity, and volatility. At the same time, Sridharan (2015) [44] investigated and found that the power of these low-risk anomalies can be enhanced by introducing the fundamentals of accounting information.

Carvalho *et al*. (2014) [11]. Provided several possible explanations for the low-risk anomaly in fixed-income markets. One possibility is that low-risk bonds are more likely to be issued by high-quality borrowers. Fiore (2015) [18]. Found the seasonality component as the possible reason for the performance of low-risk investing. He found that low-risk stocks tend to outperform high-risk stocks in the summer months but underperform in the winter months. While number of evidence have been seen in support, some criticism was also there. Ng and Phelps (2015) [33]. Found little evidence of the low-risk anomaly in the USD Corporate bond market. Blitz *et al*. (2020) [9]. Found another major concern that the anomaly is already being rapidly arbitraged away by mutual funds, ETFs, or hedge funds which more often find such investors to be on the other side of the low-risk trade.

Geographical distribution of studies on Quality Investing

From Figure 1 and Table Number 1, North America and Europe are the main contributors to the quality investing research. South Central Asia is the next highest contributor

to research related to this field, while Africa and Western Asia contribute at minimal. Next, Table Number 1 reports the highest contributing organization in the field of Quality Investing. Central University of Finance and Economics is the top contributor, followed by the University of Chicago and the University of Delhi in second place in this field of quality investing.

Fig 1: Geographical distribution of organisations contributing to study from different regions.

Table 1: Top 10 contributing organizations to the Quality Investing

Affiliation	Location	Region	Articles
Central University of Finance and Economics	China	Eastern Asia	9
University of Chicago	USA	Northern America	6
University of Delhi	India	South-central Asia	6
Banking University of Ho Chi Minh City	Vietnam	South-eastern Asia	5
Indian Institute of Management Kashipur	India	South-central Asia	5
Lappeenranta University of Technology	Finland	Northern Europe	5
Poznan University of Economics	Poland	Eastern Europe	5
University of Chicago Booth School of Business	USA	Northern America	5
University of Toronto	Canada	Northern America	5
Dongbei University of Finance and Economics	China	Eastern Asia	4

Discussion

The first cluster was focused on the fundamental values of security for its selection in its portfolio. It has almost covered every fundamental accounting signal and its performance which can be used by investors to decide the inclusion of securities into their portfolio (Abarbanell & Bushee, 1998; Bernard *et al*., 1997) [1, 7]. The second cluster has thrown some light on strategies with extraordinary performance that use very simple fundamentals to decide the inclusion/exclusion of securities in a portfolio (Mohanram, 2005; Novy-Marx, 2013) [30, 34]. Out of these fundamental strategies, the most outperforming strategy was F-Score which was designed by J.D. Piotroski and was introduced by him as an improvement over the traditional value investing given by Graham and Dodd in 1934 [22]. Further, the most successful strategy was Novy Marx's Gross Profitability which has almost outperformed all other strategies in every region and time. Further, Mohanram's G Score has also shown its performance in predicting returns in growth stocks. While the third cluster had a limited number of studies, it brought some specific low-risk investing techniques, which investors may consider fit for investing their money. In the third cluster, the focus was shifted from fundamental to market-related quality measures. It's not always the fundamental factors that generate the quality return or that help in identifying the quality stock, but some market-related factors are also able to identify the quality stocks from the perspective of return. In this cluster, the market-related measures such as beta, volatility, liquidity, etc were analysed. These factors have shown their power in the selection of stocks that can generate a quality return at lower risk (Baker *et al*., 2014; Schneider *et al*., 2020; Zaremba *et al*., 2018) [4, 39, 50].

Further, Future researchers or academicians can take up the task of mapping the industry-specific performance of these quality measures and strategies as the performance of different measures may have different impacts on different industries. A complex problem of avoiding the short sale and transaction cost constraints can be studied as most of the studies avoid these constraints. Furthermore, these

strategies can be taken up against other investment avenues, such as debts, mutual funds, currencies, and real estate.

Conclusion

This literature synthesis has given us a glimpse into the various fundamental signals that can make the way of investing quite easy. This paper has also brought some successful quality investing strategies, which can be implemented without hesitation as they have proved their performance around the world in different markets despite criticism from a few. Still, this study has some limitations, as it has mainly focused on quality investing strategies that use fundamental information as a base. This study also does not cover the non-financial fundamentals such as business models, plans, competition strategy, CSR, and compliance with regulations, and these non-financial fundamental factors have very critical implications for the future performance of any organization. Another major limitation is the coverage of literature available as this research study has taken only articles in A & A* Journal for content and articles from journals for bibliometric and network analysis. It can be concluded that the research in the field of quality investing was quite slow before 2013 but it got its pace during the pandemic and will witness much more research in this area as this research area has much more potential to explore.

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