Ella Koivuranta

Momentum as a Challenge to the Efficient Market Hypothesis

A behavioural finance perspective

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Author: Ella Koivuranta
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ABSTRACT:

This thesis examines the contradiction between the Efficient Market Hypothesis (EMH) and momentum, highlighting how the EMH assumes that security prices fully reflect all available information. The EMH implies that past prices or historical data should not influence current valuations. The momentum phenomenon, where past winners continue to outperform past losers in the short and medium term, directly challenges this assumption and therefore raises questions about the informational efficiency of markets.

The thesis also analyses behavioural factors that may explain the emergence of momentum, with particular attention given to underreaction and overreaction as mechanisms shaping how investors process new information. Based on the research literature presented, underreaction to fundamental information appears to be one plausible mechanism that contributes to the slow adjustment of prices and thus to the formation of the momentum effect. On the other hand, overreaction may lead to excessive price movements followed by subsequent corrections.

The findings of the study indicate that momentum is a broad and persistent phenomenon documented across multiple markets and asset classes. This challenges the credibility of the EMH and suggests that markets do not always incorporate information fully efficiently. Although underreaction provides one credible explanation for the emergence of momentum, the phenomenon cannot be attributed to a single mechanism, as investor behaviour is complex and influenced by both cognitive and structural market factors.

KEYWORDS: The Efficient Market Hypothesis, Behavioural finance, Momentum, Long-term reversal, Underreaction, Overreaction

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TIIVISTELMÄ:

Tässä opinnäytetyössä tarkastellaan tehokkaiden markkinoiden hypoteesin (EMH) ja momentum-ilmiön välistä ristiriitaa. Tehokkaiden markkinoiden hypoteesin mukaan arvopaperien hinnat heijastavat kaiken saatavilla olevan informaation, jolloin menneillä hinnoilla tai historiallisella tiedolla ei tulisi olla vaikutusta nykyisiin hintoihin. Momentum-ilmiö, jossa aiemmin hyvin tuottaneet osakkeet jatkavat tuottamistaan lyhyellä ja keskipitkällä aikavälillä, haastaa tämän oletuksen suoraan.

Tutkielmassa tarkastellaan myös käyttäytymistekijöitä, jotka voivat selittää momentumin syntyä. Erityistä huomiota kiinnitetään ali- ja ylireagointiin, jotka vaikuttavat siihen, miten sijoittajat käsittelevät uutta informaatiota. Esitetyn tutkimuskirjallisuuden perusteella alireagointi fundamentaaliseen informaatioon on yksi todennäköinen mekanismi, joka voi johtaa hintojen hitaaseen sopeutumiseen ja siten momentum-ilmiön muodostumiseen. Vastaavasti ylireagointi fundamentaaliseen informaatioon voi aiheuttaa hintojen liiallisia liikehdintöjä ja myöhempiä korjausliikkeitä.

Tutkimuksen havainnot viittaavat siihen, että momentum on laaja-alainen ja pysyvä ilmiö, jota on dokumentoitu useilla markkinoilla ja eri omaisuusluokissa. Tämä haastaa tehokkaiden markkinoiden hypoteesin uskottavuutta ja viittaa siihen, että markkinat eivät aina hinnoittele informaatiota täysin tehokkaasti. Vaikka alireagointi tarjoaa yhden uskottavan selityksen momentumin synnylle, ilmiötä ei voida selittää yksinomaan yhdellä mekanismilla. Sijoittajakäyttäytyminen on monimutkaista ja siihen vaikuttavat sekä kognitiiviset että markkinarakenteelliset tekijät.

AVAINSANAT: The Efficient Market Hypothesis, Behavioural finance, Momentum, Long-term reversal, Underreaction, Overreaction

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Note: The thesis has utilized ChatGPT 5.3 and Microsoft Copilot AI tools for translating text from Finnish to English, proofreading, and clarifying the structure of the thesis. The research design, analysis, interpretations, and conclusions of the thesis are the author's own work.

1 Introduction

Financial markets are traditionally viewed through the framework of the Efficient Market Hypothesis (later referred to as the EMH). It assumes that asset prices fully reflect all available information (Fama, 1970, p. 383). According to this assumption, investors are assumed to behave rationally, all information is incorporated into prices without delay, and price movements follow patterns consistent with market efficiency. As a result, it should not be possible to systematically achieve abnormal returns using available information.

However, investors do not always behave fully rationally, and real-world observations therefore challenge these assumptions. Behavioural finance started to emerge in the 1980s in response to the limitations of traditional finance. Rather than assuming that investors always act rationally, behavioural finance examines the psychological factors that influence judgement and decision-making. In contrast to perfect rationality, behavioural finance emphasizes the role of cognitive biases and other psychological factors in shaping financial behaviour. (Kumar & Goyal, 2015, p. 89-90)

Understanding these behavioural tendencies is important for evaluating how markets function in practice. If investors systematically underreact or overreact to new fundamental information, it can lead to predictable patterns in stock returns through delayed or exaggerated price changes. Such behavioural patterns are difficult to reconcile with the assumptions of the EMH.

One of the most well-documented and widely researched anomalies in financial markets is momentum. It refers to a phenomenon in which past price movements continue in the same direction over a period of time (Jegadeesh & Titman, 1993, p. 65). In other words, it is a tendency for stocks that have performed well in the past to continue to perform well in the near future, while poorly performing stocks tend to continue to underperform.

Behavioural finance has been offered as a possible explanation for momentum. Investors' underreaction to new information has been suggested as a key mechanism behind the persistence of short- and medium-term returns. This thesis will also view long-term returns as a result of overreaction.

A central insight from behavioural finance is that investors often base their decisions on observed gains and losses rather than on final outcomes (Kahneman & Tversky, 1992, p. 298). When investors rely on biased interpretations, their reactions can become either too strong or too slow. This thesis assesses the relationship between momentum, investors' behaviour and market efficiency.

1.1 Research Questions and Hypotheses

The purpose of this thesis is to examine how behavioural factors such as investors' underreaction and overreaction challenge the assumptions of the EMH. Another purpose of this thesis is to examine whether momentum can be explained by behavioural factors in investors' decision-making.

Momentum strategies rely on the persistence of stock returns over time, which may contradict the assumptions of market efficiency. Behavioural finance suggests that such patterns could arise from investors' delayed or exaggerated reactions to new information. Based on this, the thesis addresses the following research questions:

RQ1: How does the momentum effect challenge the assumptions of the Efficient Market Hypothesis?

RQ2: To what extent can momentum profits be explained by investors' underreaction to new fundamental information?

To answer these questions, the following hypotheses are made:

H1: The momentum effect is inconsistent with the assumptions of the Efficient Market Hypothesis.

H2: Investors' underreaction to new fundamental information provides a credible explanation for momentum in stock returns.

Through these questions and hypotheses, this thesis aims to deepen the understanding of how behavioural biases influence investor decision-making and to evaluate whether these behavioural patterns provide explanations to deviations from market efficiency. The focus is limited to behavioural explanations, and the thesis does not include empirical testing or evaluation of risk-based models.

1.2 Structure of the Thesis

The introduction outlines the research topic and presents the research questions and hypotheses, as well as the motivation and purpose of the study. Chapter two provides the theoretical background by defining the Efficient Market Hypothesis and its key assumptions, followed by an overview of behavioural finance. The chapter also discusses the concepts of underreaction, overreaction, and momentum. Chapter three reviews the empirical evidence on momentum across different time horizons and markets and examines how markets react to new fundamental information. Chapter four evaluates whether the momentum effect is inconsistent with the EMH and assesses the extent to which behavioural explanations, particularly underreaction, can explain the persistence of momentum profits. Chapter five concludes the thesis with a summary of the main findings.

2 Theoretical Background

This chapter delves into the theoretical background of the EMH, overreaction, underreaction, and momentum.

2.1 The Efficient Market Hypothesis

The Efficient Market Hypothesis (EMH) is one of the most well-known models in financial theory. It was first introduced by Eugene Fama in the 1970s. Fama (1970, p. 383) defines efficient markets as one in which prices fully reflect all available information. In other words, the EMH emphasizes that individual stocks and the stock markets are efficient when they reflect available information and can incorporate it into current stock prices (Konstantinidis, Katarachia, Borovas & Voutsa, 2012, p. 17).

As previously stated, according to the EMH, information and its content have an impact on stock prices. However, information can be divided into different categories depending on what the information content relates to. Cutler, Poterba and Summers (1989) define that fundamental information includes factors such as future dividends, earnings, or discount rates that determine the fundamental value of a firm. Non-fundamental information, in turn, refers to factors in news that do not directly affect the value of the firm itself. Non-fundamental information is often associated, for example, with noise trading and behavioural biases that cause investors to react to signals that have no direct impact on the value of the company (De Long et al., 1990; Barberis, Shleifer & Vishny, 1998).

Fama (1970, p. 383) classified the EMH into three different forms depending on the nature of information. These characterisations are “weak”, “semi-strong”, and “strong”.

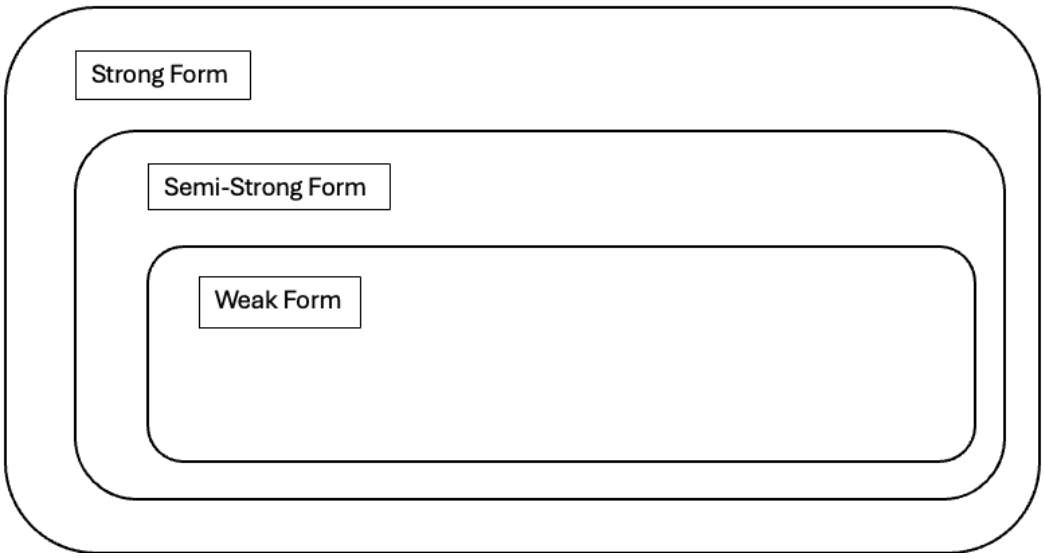

Table 1. Forms of the Efficient Market Hypothesis.

In the weak form of the EMH, current stock prices already reflect all prior information (Fama, 1970, p. 383). This would mean that if historical data, such as past prices, trading volumes, and short interests, were already reflected in stock prices, investors would not be able to use this information to systematically predict future returns. If such data provided reliable signals about future performance, investors would have already learned to make use of them. According to Hon and Tonks (2003, p. 43), the null hypothesis of weak-form market efficiency states that the performance of stock portfolios should therefore be independent of past returns.

The semi-strong form of the EHM states that all publicly available information, such as earnings announcements or stock splits, is already reflected in the stock prices (Fama, 1970, p. 383). According to Fama (1970, p. 415), the semi-strong form of the EMH states that abnormal returns can't be earned using publicly available information because the market prices rapidly adjust to new information.

The third form of the EMH is the strong form. It states that stock prices reflect all information about the firm, including public information, but also the information that

only company's insiders have access to (Fama, 1970, p. 383). In other words, in this form of the EMH, all information, both public and private, is already included in the price.

2.1.1 Market Conditions

Fama (1970, p. 387) identifies market conditions that allow prices to adjust efficiently to new information:

I. There are no transaction costs.

II. All information is available to all market participants without cost.

III. All agree on the implications of current information for the current price and distributions of future prices of each security.

Fama (1970, p. 387) points out that these market conditions do not fully reflect market in practice. He argues that these conditions are not necessary but sufficient for market efficiency. Financial markets rarely fulfil these ideal assumptions. Although, according to Fama (1970, p. 388) the existence of these frictions does not necessarily imply that markets are ineffective. If enough investors have access to relevant information and incorporate it into their investment decisions, prices can still adjust quickly to new information (Fama, 1970, p. 388).

2.1.2 Methods for Testing the Efficient Market Hypothesis

In his work Fama (1970) presents the Fair Game model, the Submartingale model and the Random Walk model as models of stock market behaviour. Fama (1970, p. 385) states that according to the Fair Game model, it is impossible for investors to make abnormal profits using available information because the expected return on an investment when all available information is given, is zero. Instead, the Submartingale model suggests that

the expected value of the price in the next period is equal or bigger than the current price (Fama, 1970, p. 386).

The Random Walk model is an extension of the Fair Game model. Fama (1970, p. 387) argues that the Random Walk model provides stronger features and a more detailed picture of the economic environment than the Fair Game model. The Random Walk model proposes that price changes and expected return distributions are independent of the information available (Fama, 1970, p. 387). Malkiel (2003, p. 59) defines its logic by arguing that if the flow of information is unimpeded and information is immediately reflected in prices, then tomorrow's price change will reflect only tomorrow's news and will be independent of today's price changes.

The three forms of the EMH correspond in different ways to different types of tests. The semi-strong tests of the efficient market models are mostly concerned with whether current prices fully reflect all publicly available information (Fama, 1970, p. 404). The strong model also concerns whether the information is fully reflected in prices, but also that no individual has greater trading profits because they have potentially monopolistic access to some fundamental information (Fama, 1970, p. 409). The weak form concerns mainly the predictability of future returns based on past returns (Fama, 1970, p. 401). This thesis pays special attention to the weak form of market efficiency.

2.1.3 Problems of the Efficient Market Hypothesis

Although the EMH is the central organising principle of academic finance, its relevance has been questioned. The problems arise from market behaviour, such as behavioural biases and irrationality, market anomalies, and limits to arbitrage that derive from the EMH's assumptions of rational investors, frictionless markets, and quick information processing.

As Fama (1970) defines in his article, the EMH is often associated with the idea of a random walk. However, this has also been considered problematic. For instance, Maloumian (2022, p. 1) notes how bubbles and crashes appear too frequently to be consistent with the Random Walk Model. According to Maloumian (2022, p. 3) financial markets are a complex and non-linear system that the assumptions of the EMH can't describe. In general, Maloumian (2022) argues that the EMH fails to account for real-world complexity and emergent market behaviour.

Another problem to the EMH stems from behavioural finance and market anomalies. Behavioural finance suggests that investors deviate systematically from rational decision-making and psychological biases such as overconfidence and herding can lead to predictable patterns in asset prices (Naseer & Tariq, 2015, p. 3). This contradicts the EMH's assumption that investors behave rationally. The next chapter will deepen to behavioural finance and momentum as 'anomaly'.

2.2 Behavioural Finance

Humans are complex beings influenced by various psychological aspects. Financial choices are usually made by investors who are under the influence of psychological traits. Behavioural finance provides guidance and assistance in understanding investors' financial choices (Noreen, Shafique & Saeed, 2022). Biases, emotions, and other social aspects are some examples of psychological foundations of behavioural finance.

In normative decision theory, Bayes' rule provides a mathematically correct standard for how beliefs should be updated when new information emerges. Slovic, Fischoff, and Lichtenstein (1977, p. 6) note that Bayes' rule represents a normative benchmark against which human judgement can be compared. Bayes' rule states that individuals combine their prior beliefs with the probability of observed evidence to form posterior beliefs. This principle is central to rational choice models, where belief updating is assumed to follow the basic assumption of probability theory.

In financial theory, Bayes' rule forms the foundational basis for how the behaviour of rational investor is defined. Barberis and Thaler (2002, p. 2) emphasise that a rational individual should updates their beliefs quickly and correctly according to Bayes' theorem and then make decisions based on these updated beliefs in a normatively acceptable way. According to this framework, only fundamental information should influence beliefs and prices, while non-fundamental signals should be ignored.

Sandroni (2005, p. 131) further develops this idea by arguing that in efficient markets, investors are expected to update their expectations in a Bayesian manner, meaning that prices should immediately reflect all available information. In this view, Bayesian updating provides the theoretical link between rationality and market efficiency. If all investors were to update their beliefs according to Bayes' rule, prices would adjust instantly to new fundamental information.

As noted earlier, the EMH assumes that people are 'rational' but behavioural finance contradicts this. Fama (1970) defines a rational investor as one who processes all available information perfectly and objectively. Barberis and Thaler (2002, p. 2) define rationality as a process by which, upon receiving new information, agents update their beliefs correctly and without delay, in the manners described by Bayes' rule. Second, agents make decisions based on these updated beliefs in a normatively acceptable way (Barberis & Thaler, 2002, p. 2).

Barberis and Thaler (2002, p. 2) contrast this with irrationality, which refers to systematic deviations from these normative principles. Irrational investors may update their beliefs in a biased or inconsistent manner, relying on heuristics, opinions or non-fundamental signals rather than objective information (Barberis & Thaler, 2002, p. 3). As a result, irrational investors' decisions may lead to predictable patterns, such as underreaction, overreaction, or other behavioural biases that can distort prices.

Behavioural biases can be described as tendencies or assumptions that affect how investors behave (Schulz, 2023, p. 41). Behavioural finance emerged from the need to explain why investors' behaviour deviates from rational investment decision-making and instead tends to make irrational decisions when processing financial information (Kumar & Goyal, 2015, p. 90). According to Kumar and Goyal (2015) the answer to this question is behavioural biases that affect investors' rational decision-making.

One of the first foundations for modern behavioural finance was proposed by Kahneman and Tversky in 1979 with the introduction of prospect theory. Their later work, published in 1992, exceeds the original theory. According to their later work (1992, p. 299), in prospect theory, people evaluate outcomes relative to a reference point, react more strongly to losses than gains and distort probabilities in predictable ways. Kumar and Goyal (2015, p. 90) point out that these phenomena are due to cognitive biases that affect the evaluation of the gains and losses.

2.3 Market Reactions

Investors receive fundamental information that affects the companies' market prices. When news deviates from expectations, either exceeding or falling short of them, it triggers different market reactions (Fink, 2021, p. 2). The most well-documented reactions in financial theory are underreaction and overreaction.

Barberis, Shleifer, and Vishny (1998) presents a model that describes how investors form beliefs that lead to underreaction and overreaction in financial markets. In their framework, the earnings of an asset follow a random walk, but investors mistakenly believe that returns vary between two regimes. In the first regime, earnings are mean-reverting, while in the second, they are expected to continue rising after an increase. According to Barberis et al. (1998, p. 310), when a positive earnings surprise is followed by another, investors increase the probability that the company is in the

trending regime. Conversely, when a positive surprise is followed by a negative one, they give a higher probability to the mean-reverting regime.

Several studies have divided behavioural factors into categories to capture short- and long-horizon mispricing. For example, Daniel, Hirshleifer, and Sun (2020, p. 1674) illustrate how investors with limited attention underreact to incoming public information quite often, but such subsequent results should be corrected quickly when new earnings are reported. In contrast, Daniel et al. (2020, pp. 1674–1675) argue that behavioural factors such as overconfidence can lead to overreaction, making investors relatively unwilling to revise their beliefs as new earnings news arrives. As a result, the correction of this mispricing occurs over a much longer time horizon.

2.3.1 Underreaction

Underreaction refers to a situation where investors incorporate new information into stock prices gradually rather than immediately. Instead of adjusting prices immediately after news is released, markets respond slowly, causing returns to drift in the direction of the original announcement. Underreaction represents a systematic deviation from the Bayesian benchmark introduced earlier, because investors incorporate fundamental information more slowly than the normative model predicts.

Barberis et al. (1998, p. 310) define underreaction as a pattern in which the average return following good news exceeds the average return following bad news. According to Barberis et al. (1998, p. 308), when investors do not to adjust their expectations to new fundamental information, prices adjust only gradually, leading to continuation of short-term returns. Their key finding is that after a series of positive earnings surprises, stocks tend to outperform those that have experienced negative surprises.

Behavioural finance offers several psychological explanations for this gradual incorporation of fundamental information. Biases such as conservatism and

self-attribution suggest that cognitive limitations and biased belief updating slow down investors' reactions to new information, creating predictable patterns in stock returns.

Underreaction has been explained by psychological biases such as conservatism. It suggests that individuals are slow to update their beliefs when new information or evidence becomes available. Conservatism may lead investors to ignore the entire content of, for example, earnings announcements. Individuals tend to underweight useful statistical evidence relative to less useful evidence that they have used to form their prior views. (Barberis et al. 1998, p. 315).

Another behavioural factor that explains underreaction as a market reaction is self-attribution. Daniel, Hirshleifer, and Subrahmanyam (1998, p. 1844) explain this as a people's tendency to credit themselves for past success while blaming past negative outcomes on external factors. According to this, people's confidence strengthens when the information is consistent with their prior beliefs, but contradictory information does not affect it to the same extent. Thus, investors' beliefs adjust slowly and partially and may create delayed or inadequate reactions. Daniel et al. (1998) show that firms with high past returns earn significantly positive abnormal returns for 3–12 months, reflecting the slow correction of biased belief updating.

2.3.2 Overreaction

Overreaction refers to a situation where investors place too much emphasis on recent information and extrapolate past trends too far into the future. As a result, stock prices may deviate too much from their fundamental values. This, in turn, may later lead to long-term return reversals.

Barberis et al. (1998, p. 313) describe overreaction as a pattern in which the average returns following a series of good-news are lower than the returns following a series of bad-news. They find that overreaction to similar news patterns tends to occur over a

long period of three to five years (Barberis et al., 1998, p. 308). According to their model, series of positive news can generate excessive optimism, while negative news can create unwarranted pessimism. Because of this, investors can overestimate the persistence of recent trends and misprice future prospects (Barberis et al., 1998, p. 313). In other words, investors tend to assume that the trend will continue when market receives repeated good or bad news.

Like underreaction, overreaction has been widely associated with behavioural factors. Several psychological biases can lead investors to respond too strongly to fundamental information and thereby causing stock prices to deviate from their fundamental values. Overreaction can also be interpreted as a deviation from Bayesian updating, as investors overestimate recent signals relative to their prior beliefs.

Overreaction has been explained, for example, by the representativeness bias. Tversky and Kahneman (1973, p. 237-238) describe this bias as the tendency for individuals to perceive consistent patterns in random sequences. Barberis et al. (1998, p. 313) illustrates how investors may assume that a company with a long history of strong earnings growth will continue to grow at the same pace in the future. Consequently, investors may easily ignore the fact that a history of high earnings growth is unlikely to repeat itself, and as a result of the heuristic, overvalue the company (Barberis et al., 1998, p. 316).

Another behavioural bias related to overreaction is overconfidence. Daniel et al. (1998) examines the role of overconfidence in market reactions. They define overconfidence as a situation in which individuals tend to overestimate their own abilities. They argue that overconfident investors place too much weight on their private information signals, to which they feel a stronger personal attachment. At the same time, they react less strongly to public information. This potential imbalance can lead to mispricing, when private signals are overweighted and public signals underweighted.

Together, these behavioural biases help explain why investors may overreact to fundamental information or trends, leading to excessive price movements and long-term return reversals.

2.4 Momentum in Stock Returns

Behavioural finance has been used to explain anomalies such as momentum by emphasising the role of psychological biases and irrational behaviour among investors (Degutis & Novickyte, 2014). Schwert (2003, p. 2) defines anomalies as empirical results that are inconsistent with maintained theories of asset-pricing behaviour.

Momentum is one of the most well-documented ‘anomalies’ in financial markets. It is most commonly observed over short- to medium-term horizons which is typically 3–12 months. On the other hand, over long horizons there may occur reversals in returns.

Jegadeesh and Titman (1993) were the first to document momentum in the form in which it is commonly understood today. They define it as a phenomenon where stocks that have performed well in the past continue to perform well, while stocks that have performed poorly continue to perform poorly (Jegadeesh & Titman, 1993, p. 659). This suggests a positive relationship between past and future returns, which is difficult to reconcile with the assumptions of the EMH, especially in its weak form.

Jegadeesh and Titman (1993, p. 65) found that strategies that buy stocks with rising prices and sell stocks with declining prices, generate significant positive returns over holding periods of 3–12 months. In their later study, published 2001, Jegadeesh and Titman were able to confirm their results that were published in 1993. This later work showed that momentum profits remain strong across time periods and market conditions.

Asness, Moskowitz, and Pedersen (2013) show that the momentum effect is present in all global markets. Although momentum is considered one of the most persistent 'anomalies', its magnitude varies considerably across countries (Fama, 1998; Xia, Hu, Xia & Chi, 2023). Xia et al. (2023, p. 1142) find that the momentum effect is generally stronger in mature markets than in emerging markets. They further note that when fundamental traders dominate, momentum is usually stable and followed by a reversal, while in extreme market conditions it becomes less reliable.

Although the existence of momentum is widely documented, the reasons behind it are still debated in the literature. Explanations can broadly be divided into risk-based and behavioural-based approaches. Risk-based explanations view momentum profits as compensation for systematic risk factors, such as liquidity risk or limits to arbitrage. In contrast, behavioural explanations emphasize the role of investor's biases and deviations from rational expectations. Explanations based on human psychology and behaviour often stem from underreaction and overreaction, which are also used in the hypothesis of this thesis. However, momentum has not been conclusively explained by any single model.

Underreaction to new information has been proposed as a key mechanism behind short- to medium-term momentum. When investors incorporate fundamental information into prices gradually rather than immediately, prices continue to adjust over time, leading to return continuation. This interpretation is consistent with the evidence presented by Jegadeesh and Titman (1993) as well as Hong and Stein (1999), who argue that information spreads slowly across market participants.

Despite extensive research, no single explanation can fully explain for the momentum effect. This makes momentum a particularly important phenomenon in evaluating the validity of the EMH and highlights the importance of behavioural finance in explaining deviations from market efficiency.

3 Literature Review

The literature review builds on the theoretical background by examining how key concepts interact in practice and how previous research has evaluated the relationship between investors' behaviour and return predictability. This chapter highlights how behavioural factors shape price dynamics and may lead to deviations from the predictions of the EMH.

Underreaction, overreaction, and momentum together form a behavioural finance framework that is examined in this chapter. Investors' slow and excessive reactions to fundamental information generate systematic price trends.

3.1 Underreaction as an Explanation for Momentum

As mentioned previously, underreaction is typically observed over short time periods (1–12 months). During this period, fundamental information is incorporated gradually in the prices, creating positive autocorrelation (Barberis et al., 1998, p. 308). This means that price movements tend to continue in the same direction for some time after the initial news event.

Empirical evidence also supports the idea that stock returns exhibit short-term continuation patterns consistent with underreaction. Cutler et al. (1991, p. 535) find positive autocorrelation in excess stock returns over time horizons of one month to one year. Cutler et al. (1991) state that the average one-month autocorrelation in excess stock returns is about 0.1 across the world. Their findings suggest that returns tend to continue in the same direction over short time horizons, suggesting that information is incorporated into prices gradually rather than immediately. This type of delayed price correction is consistent with the underreaction hypothesis and helps explain the persistence of momentum returns.

Momentum has been proposed to arise from markets' reactions to new fundamental information. When prices do not immediately reflect all available information, positive news is incorporated into market prices gradually, which in turn, leads to the continued of returns over several months. This model of slow information diffusion is central to the findings of Jegadeesh and Titman (1993) and Hong and Stein (1999).

Jegadeesh and Titman (1993) present an argument that investors' underreaction leads to short- and medium-term momentum because prices do not respond immediately to new fundamental information. According to Jegadeesh and Titman (1993, p. 67) momentum arises because fundamental information spreads only gradually among different types of investors, which causes prices to adjust with a delay. Because momentum traders react mechanically to past price movements, their trading strengthens the short-term trends. This interaction creates a predictable return continuation in the short and medium term. Within this framework, momentum is not a clear sign of irrationality, but rather a consequence of heterogeneous information processing, which can prevent prices from fully reflecting fundamental news.

Hong and Stein (1999) also highlight in their study how momentum is generated by investors' underreaction to fundamental information. Their model includes two groups, the so-called "news watchers" and "momentum traders". News watchers make predictions about the future based on publicly available information, while momentum traders act on past price movements. According to their study, information spreads slowly among investors, and investors are unable to extract fundamental information from prices. As a result, this leads to return continuation in the short term and, at the same time, to positive autocorrelation in returns.

Barberis et al. (1998, p. 312) show that in addition to the period of underreaction, prices also underreact to relatively mundane news, such as earnings announcements. According to Fink (2021, p. 2), stocks react to earnings surprises with a price adjustment that reflects the new fundamental information contained in the announcement.

Empirical studies show that this correction can take months to even out, leading to a clear drift pattern in stock prices (Fink, 2021, p. 2).

3.1.1 Post-Earnings Announcement Drift

Post-earnings announcement drift (PEAD) is a type of market anomaly to which underreaction is closely related. The basic idea is that stock prices adapt gradually to the news surprise of earnings announcements (Fink, Palan & Theissen, 2024, p. 2800). First, the price underreacts and then drifts in the direction of the surprise for long periods of time (Fink et al. 2024, p. 2800).

Bernard and Thomas' (1989) article is one of the classic studies demonstrating PEAD. They offer several possible explanations of why there is a delayed reaction to information. According to their article, stock prices continue to move in the same direction of the surprise several months after because investors are unwilling to form unbiased expectations of the future. Another reason is that investors overestimate historical returns and easily underestimate the persistence of earning surprises. Prices continue to move in the same direction, causing autocorrelation in returns.

Bernard and Thomas (1989) provide strong empirical evidence for PEAD, showing that stock prices continue to move in the direction of earnings news long after the announcement date. Their results show that stocks that experience positive earnings surprises generate an additional drift of about 2% over the next 60 trading days, which corresponds to an abnormal quarterly excess return of about 4. This delayed price adjustment suggests that investors do not fully incorporate new earnings information at the time of announcement, which is consistent with the underreaction hypothesis. Rather than adjusting immediately, markets appear to process information gradually, leading to return continuation after the initial news event.

Fink et al. (2024, p. 2800) argue that the underlying cause of the drift is a slow and incomplete adjustment of prices to fundamental prices. Fink, et al. (2024) focus mainly

on the link between earnings autocorrelation and PEAD. They show that the drift remains observable even in the absence of positive autocorrelation, reinforcing the notion that, behavioural factors, in addition to statistical properties, drive the anomaly.

3.2 Evidence of Momentum

As explained previously momentum refers to a situation where the stocks which have performed well in the past tend to continue to perform well in the future. This section presents well-known empirical studies on the momentum phenomenon. The studies differ in how momentum strategies generate returns over short- and medium-term horizons.

3.2.1 Short-term and Medium-term Momentum

A significant amount of empirical research provides strong support for the existence of momentum in stock returns. Jegadeesh and Titman's article (1993) is widely considered as the foundation of modern momentum research. It systematically documents that past winners continue to outperform past losers over a 3–12-month horizon. In their research Jegadeesh and Titman divide K as a holding period and J as the formation period, during which the price changes are observed. Based on this, they form ten equally weighted deciles portfolios and arrange them in order, with the top decile portfolio called "winners" and the bottom decile portfolio called the "losers". Each month, the strategy buys the winning portfolio and sells the losing portfolio. After this the position is held for K months. This winner-loser portfolio is rebalanced monthly.

Jegadeesh and Titman (1993) find that the portfolio generates positive returns for all combinations of holding periods of 3, 6, 9, and 12 months from the date of formation. For example, a strategy that selects stocks based on their past six-month returns and holds them for six months produces an average annual return of 12,01% (Jegadeesh & Titman, 1993, p. 89). After 12 months, however, momentum strategies no longer

produce positive returns. This finding is especially important because it contradicts the predictions of the weak form of the EMH.

The robustness of the momentum effect is further supported by Jegadeesh and Titman (2002), who confirm their earlier findings on momentum. In their early 2000s study, they focus particularly on stocks that have performed well during the six months prior to portfolio formation. Their findings indicate that the performance of momentum strategies is not tied to a specific period, but rather that the phenomenon remains consistent across different market environments. They also examine potential risk-based explanations and structural changes in markets, but their results do not suggest that the performance of momentum strategies declines as market conditions evolve. Therefore, their findings support the persistence of the momentum effect and the view that it is difficult to explain using traditional risk models, reinforcing the argument that behavioural factors play a significant role in the distribution of returns in both short- and medium-term.

While momentum is widely accepted, there is less consensus on the time horizon over which it is strongest. Novy-Marx (2012) challenges the traditional emphasis on short-term past returns by arguing that medium-term returns provide more meaningful information about company's performance. Novy-Marx (2012) does not challenge the existence of the momentum phenomenon itself, but rather the time horizon that best captures it. In other words, unlike Jegadeesh and Titman (1993), Novy-Marx (2012) argues that 6–2-months returns do not reflect a company's performance as well as returns from 12–7-months before the portfolio is formed. His study finds that medium-term returns (7–12 months) generate the highest returns 1,2% per month while the 6–2-month strategy generates 0,67% per month. This suggests that momentum is sensitive to the way past returns are measured and highlights the importance of distinguishing between different formation periods.

Supporting this view, Gong et al. (2015) provide further evidence that momentum profits vary over time horizons. Gong et al. (2015) divide stocks into ten groups based on how stocks have cumulatively performed over the 12–7, 11–7, 6–2, and 6–3 months prior to portfolio formation. Their study finds that momentum returns are highest (0,78) over the 12–7-month period and lowest in the 2–6 month returns (0,25). On the other hand, they also find that returns over the 3–6-month period increases to 0,66, which is significantly higher than the returns over the 2–6 month but still lower than the 12–7 month returns. Looking at the returns over the 11–7 month (0,65), it is observed that they are lower than the 3–6 month returns. In other words, Gong et al. (2015) find that momentum strategy returns are highest when the first two months before portfolio formation are excluded. However, returns are also generated in the second month, as indicated by the 2–6 momentum strategy although to a much lesser extent.

Hong, Lim and Stein (2000) find that momentum is particularly strong among small firms and firms with low analyst coverage. Their findings suggest that momentum profitability declines sharply as firm size increases. This suggests that firm-specific information diffuses more slowly among smaller firms. They further argue that extensive analyst coverage reduces the strength of momentum because information is incorporated into prices more rapidly when analysts are following closely companies. In particular, the study reports monthly momentum profits of approximately 1% for small and less-followed firms, while momentum profitability significantly weaker for large firms. These findings support the idea that fundamental information is slow to spread in some stocks, which makes momentum stronger when investors are not receiving new information quickly.

All these findings support momentum as a well-established phenomenon. However, the strength of the profits depends on the time horizon and the possible way of measuring it. There is no single momentum strategy that produces consistently stable returns. This highlights the complexity of the momentum effect and the importance of understanding the key mechanisms behind it.

3.2.2 Momentum Across Markets

Several studies have succeeded in demonstrating that momentum is a statistically significant and repeatable 'anomaly'. Early studies focused mainly on the U.S. market, but later research show that the impact of momentum is not limited to a single geographical area. Momentum has been observed in many market areas and across asset classes, confirming that it is a broad and robust phenomenon.

Rouwenhorst (1998) is among the first to study the existence of momentum outside the USA. In his work, he examines the momentum phenomenon in 12 different European countries. According to his study, a momentum strategy that buys past medium-term winners and sells past medium-term losers generates 0,98 % profits per month. According to him, European and U.S. momentum strategies may have a common component that could explain the profitability of the strategy in both markets. This may indicate that the phenomenon is not market specific.

Further support for the global nature of momentum is provided by Griffin, Ji, and Martin (2003). In their study, they use stocks from approximately 40 countries. They show that in all these countries across Africa (1,42 %), America (0,50%, excluding the US.), Asia (0,13%), and Europe (0,70%), momentum strategies generate positive returns. As illustrated, their study indicates that momentum returns are weaker in Asian countries than elsewhere. Griffin et al. (2003, p. 2522) show in their study that momentum is weaker in emerging markets (0,27% per month) than in developed markets (0,72% per month, non-U.S. developed markets).

Based on this, Chui, Titman, and Wei (2010) examine whether cultural factors across countries, especially individualism, affect the emergence of momentum. They demonstrate, consistent with Griffin et al. (2003), that momentum exists globally, but is weaker in Asia and particularly in East Asian countries. The highest momentum returns in their study were observed in Poland (1,76% per month), Bangladesh (1,67% per

month), New Zealand (1,58% per month), and Canada (1,34% per month). All countries except Japan, Korea, Taiwan, and Turkey generated positive returns.

At the same time, Chui et al. (2010) find that momentum returns increase monotonically with individualism. In countries where the momentum strategy did not generate positive returns, individualism is also relatively low. Chui et al. (2010) explain this by, for example, weaker overconfident behaviour. In less individualistic cultures, individuals place less emphasis on their own views, and deviating from the majority is less common. Momentum has thus been documented worldwide, although significant differences in its strength do exist. In addition, momentum has been found to occur across different asset classes. Asness et al. (2013) examine the presence of momentum across eight different markets and asset classes. They provide consistent evidence of momentum across asset classes, such as equities, commodities, and government bonds. In addition, Novy-Marx (2012) also illustrates evidence on momentum in different asset classes such as commodities, currencies, and country indexes.

Overall, the empirical evidence suggests that momentum is a global and persistent 'anomaly', although its strength varies across countries, market structures, and cultural environments. It is important to consider both institutional and behavioural factors when explaining momentum.

3.3 Long-term Reversal and Overreaction

As explained in the previous chapter, momentum is well-documented over the short- and medium-term horizons. However, over longer time horizons of 3–5 years, returns have been observed to reverse. This pattern is inconsistent with the persistence of short-term returns and suggests that different mechanisms may drive returns over different time horizons. Jegadeesh and Titman (1993), among others, suggest that investors may underreact to short-term firm-specific news while overreact to long-term prospects.

A classic empirical example of long-term reversal is provided by DeBondt and Thaler (1985). In their article, they show that portfolios of past “loser” stocks outperform past “winner” stocks over long holding periods. In their article DeBondt and Thaler (1985) document that during a period of 3–5 years after foundation of the portfolios the “loser” stocks are earning more than the “winner” stocks. For instance, in the conclusion of their article DeBondt and Thaler (1985, p. 804) state: “Thirty-six months after portfolio formation, the losing stocks have earned about 25% more than the winners…”. Importantly, DeBondt and Thaler (1985) interpret this pattern as an overreaction by investors, who overestimate past performance while underestimating fundamental information. As a result, prices deviate from fundamental values and later correct, leading to reversal.

More evidence for long-term reversal is provided by Fama (1998). He argues that investors overestimate historical returns and underestimate the fact that returns often normalise over time. Fama (1998, p. 285) further refers to Lakonishok, Shleifer and Vishny (1994) who show that valuation ratios such as E/P, C/P, and BE/ME reflect firm’s past performance. Firms with high valuation ratios typically have weak historical growth, while firms with low ratios have strong past growth. Fama (1998, p. 286) argues that this suggests that market’s overreaction to past growth patterns leads to surprises when earnings return to their long-term average. However, Fama (1998) is critical towards the evidence of long-term returns. He argues that most anomalies are too fragile and tend to disappear when alternative approaches are used to measure them and therefore do not provide enough valid evidence (Fama, 1998, p. 287-288).

While early studies focus on empirical regularities, later research provides behavioural explanations that combine momentum and long-term reversal to a unified framework. Daniel et al. (1998) highlight long-term reversal and link it to investors’ overreaction. They explain a behavioural mechanism that combines both momentum and long-term reversal.

According to Daniel et al. (1998, p. 1842), momentum arises because investors overreact to fundamental information in the short term. They explain this as a result of overconfidence and biased self-attribution. Investors place excessive weight on their own knowledge relative to public information, which leads them to overreact to private fundamental information. Biased self-attribution further reinforces this when investors interpret successes as their own merit and at the same time strengthening their confidence. In the long term, public information gradually begins to compensate for the earlier overreaction, which leads eventually to reversal. The dynamics of the model are consistent with prior empirical literature, which shows that portfolios formed on the basis of overreaction can lose several percentage points in the long run as the initial mispricing eventually corrects itself.

Similarly, Barberis et al. (1998) and Hong and Stein (1999) also combine short-term momentum and long-term reversal into a single behavioural mechanism in their studies. In both articles, momentum is seen as the result of investors' slow reaction to new information, while long-term reversal is the result of investors' overreaction that corrects over time. This perspective highlights the dynamic nature of market inefficiency, where different behavioural biases dominate different horizons.

However, some studies suggest that momentum and long-term reversal do not necessarily arise from the same behavioural mechanism. George and Hwang (2004, p. 2146) argue that momentum can be driven by behavioural forces that are distinct from long-term overreaction. Specifically, investors' tendency to anchor their expectations to past price levels such as the 52-week high. They show that stocks trading close to their 52-week highs generates a monthly momentum profit of about 0.45%, and these returns do not reverse. Their evidence therefore indicates that momentum and long-term reversal may reflect different underlying processes rather than two opposite phases of a single behavioural effect.

In their later study, George and Hwang (2007) examine whether long-term return reversal is due to investors' overreaction or tax-motivated trading. They present two competing explanations. The first is the overreaction hypothesis, which suggests that investors may misinterpret past performance and push prices above levels justified by fundamentals after which prices eventually reverse as the mispricing corrects. The second explanation is based on tax-related trading behaviour, which states that investors tend to sell losing stocks at the end of the year to realise tax losses, causing temporary price declines that reverse at the beginning of the following year. Their empirical results show that long-term reversal is more consistent with tax-motivated trading than with investor overreaction.

Put together, the literature suggests that long-term reversal is a robust empirical phenomenon although the reasons behind it are still debated. While behavioural explanations based on investor overreaction provide a compelling framework, alternative explanations highlight, for example, the role of market structure. Overall, the ongoing debate about the causes of both momentum and reversal suggests that they may arise from multiple interacting mechanisms rather than one single cause.

3.4 Summary of Findings

The third chapter reviewed momentum and related scientific research. In this thesis, the phenomenon was approached specifically from the perspective of behavioural finance. A key finding in the literature is that momentum can be partly explained by tendency of investors to underreact to new fundamental information. Underreaction leads to the slow adjustment of stock prices, which produces predictable return patterns in the short and medium term.

Empirical research provides extensive evidence of the existence of the momentum phenomenon in different markets and time periods. In particular, short- and

medium-term momentum strategies have proven to be profitable, which is inconsistent with the weak form of the EMH.

Studies have shown that in the long term, stocks that have previously performed well begin to underperform, while stocks that have performed poorly begin to outperform. This reverse pattern indicates that investors overreact to fundamental information. According to the literature presented in this thesis, momentum and reversal together form a behavioural pattern among investors that reflects how psychological characteristics affect investor behaviour and the achieved returns. Underreaction and overreaction form a behavioural pattern that can occur at the same time financial markets, but they usually to manifest over different time horizons.

The table below summarises the empirical studies presented in section three. The table shows whether the study examines the short, medium, or long term, where the sample is collected from, how it is collected, and what the average deviation in the study is. All these studies suggest the existence of momentum, but its strength varies.

Table 2. The summary of empirical studies.

STUDY	THE SAMPLE	TIME PERIOD	THE METHOD	AVERAGE DEVIATION
De Bondt & Thaler (1985)	US stocks (NYSE)	3–5 years	Long-term winner–loser reversal portfolios	Losers outperform winners by 25% over 35 months
Bernard & Thomas (1989)	US firms	1–12 months	PEAD tests	PEAD drift 2 – 3% next 60 days
Jegadeesh & Titman (1993)	US stocks	3–12 months	Winner–loser portfolios	0.5 – 1% / month
Rouwenhorst (1998)	European stock markets	3–12 months	Winner–loser portfolios	0,98 % / month
Hong & Stein (1999)	US stock market	1–12 months	Information diffusion model tested empirically	Momentum strongest where coverage low
Hong, Lim & Stein (2000)	US stocks	1–12 months	Momentum returns by firm size	Around 1% / per month among small firms
Lakonishok, Shleifer & Vishny (1994)	US stocks	3–5 years	Contrarian portfolios	1% / month
Novy-Marx (2012)	US stocks	7–12 months	Alternative momentum windows	1,2 % / month
Gong, Liu & Liu (2015)	US stocks	2–12 months	Subperiod momentum returns	Highest reruns 0,78% / month (12–7 months)
Chui, Titman & Wei (2010)	Global markets	3–12 months	Momentum by country & culture	1,3 – 1,7 % / month
Griffin, Ji & Martin (2003)	Global markets	3–12 months	Global momentum portfolios	Developed markets 0,72 % / month Emerging markets 0,27 % / month
Asness, Moskowitz & Pedersen (2013)	Global equities, bonds, FX and commodities	3–12 months	Cross-asset momentum	Positive momentum across all assets

4 Discussion

This section discusses the findings of the literature review in relation to the research questions and hypotheses, which focus on the momentum effect and its implications for market efficiency. The research questions addressed are RQ1: How does the momentum effect challenge the assumptions of the Efficient Market Hypothesis, and RQ2: To what extent can momentum profits be explained by investors' underreaction to new fundamental information. The corresponding hypotheses are H1: The momentum effect is inconsistent with the assumptions of the Efficient Market Hypothesis, and H2: Investors' underreaction to new fundamental information provides a credible explanation for momentum in stock returns.

Regarding the first research question (RQ1), the findings of this study highlight a clear tension between the EMH and the empirical evidence on momentum. While the EMH assumes that stock prices reflect all currently available fundamental information and are independent of past prices, momentum is instead based on the idea that past returns contain signals that can be used to predict the future price development of stocks.

As noted earlier, this analysis has also received its challengers. Malkiel (2003, p. 62) shows that many documented anomalies tend to disappear once they become widely known and this has been explained as evidence supporting market efficiency. For example, in the January effect, where investors' anticipation of the anomaly may lead to them buying stocks earlier in December and selling them earlier in January, eventually eliminating the effect altogether (Malkiel, 2003, p. 63).

Malkiel (2003, p. 60) also presents a more nuanced perspective in which markets could remain efficient even if investors behave partly irrationally or if anomalies appear in market. According to this view, market efficiency does not necessarily require perfect rationality, but rather that indicates that investors find it difficult to systematically exploit the fundamental information available to them.

However, the literature review shows consistently that momentum returns appear across different markets and time periods. This challenges the assumption within efficient markets that anomalies are only temporary and short-lived. For example, the views presented by Malkiel (2003) and Fama (1970), suggesting that markets could remain efficient even if irrational behaviour occurs, are difficult to justify convincingly given how the concept of market efficiency is defined. Momentum inevitably challenges, in particular, the weak form of the EMH.

Based on the literature, a question can also be raised as to what extent momentum should be regarded as a market 'anomaly', even though it has been present in financial markets for several decades. Within the EMH literature, anomalies are often interpreted as temporary deviations from market efficiency rather than as evidence against the EMH itself. The long-term nature of momentum suggests that it may reflect deeper structural or behavioural mechanisms rather than a short inefficiency. This makes it even more difficult to assess market efficiency within the EMH framework.

When evaluating the first hypothesis (H1) and considering these findings, it can be concluded that the momentum effect is inconsistent with the EMH. The existence of momentum conflicts with the core assumptions of the EMH. Therefore, momentum constitutes a fundamental contradiction, especially for the weak form of market efficiency. The conflict is less direct in the semi-strong and strong forms, which consider a larger data set. On the other hand, another anomaly, the PEAD is in direct contradiction with the semi-strong form of the EMH. Although this thesis does not focus directly on PEAD, its existence can be considered as further evidence of the inconsistency within the current formulation of the efficient market concept.

In terms of the second research question (RQ2) and hypothesis (H2), the findings support the idea that investors' behaviour plays a role in explaining momentum. The literature presented offers significant evidence for investors' underreaction to

fundamental information and its impact on their decision-making. Underreaction suggests that investors do not fully incorporate new fundamental information into prices immediately but instead gradually change their expectations over time. As a result, prices continue to drift in the direction of the original news, creating momentum in the short and medium term. The gradual adjustment of prices suggests that markets do not always process fundamental information efficiently, supports the notion that psychological biases and cognitive limitations influence investors' behaviour.

However, it is important to approach this explanation with caution. While underreaction provides a plausible and widely supported explanation for momentum, the literature does not prove that it is the only underlying cause. Financial markets are complex systems in which multiple factors interact simultaneously. Alternative explanations, such as risk-based factors and limits to arbitrage, may also contribute to momentum returns. Furthermore, different explanations may be more relevant over different time horizons, with behavioural factors playing a larger role in the short term.

From a practical investment perspective, the findings suggest that momentum strategies can offer opportunities for investors to earn abnormal returns, especially over the short to medium term. The evidence that prices adjust gradually to new fundamental information suggests that past return patterns can provide useful information about future price movements. However, practical implementation remains quite challenging. For example, transaction costs, market frictions, changing market conditions, and the widespread popularity of momentum strategies can reduce their profitability over time. In addition, momentum strategies often involve significant drawdowns and higher risks when market reversals. While momentum can offer practical benefits for portfolio management and trading strategies, investors should approach these strategies with caution and understand that their effectiveness may change in different market environments

Overall, the results of this study offer a support for both hypotheses. The results suggest that momentum challenges the assumptions of the EMH and that investor behaviour can be seen as one explanation for the phenomenon. However, it is important to take into account that financial markets are influenced by multiple interacting factors, and human behaviour itself is inherently complex. While behavioural explanations can offer a compelling framework for understanding momentum, alternative explanations, such as risk-based factors or market dynamics, may also contribute to the observed effects. Thus, momentum should be understood as a varied phenomenon and not as the result of a single explanatory factor.

5 Conclusion

This thesis examines how the momentum effect challenges the assumptions of the EMH and to what extent investors' behaviour can explain the persistence of momentum profits. The theoretical background and literature review show that, while the EMH assumes that prices reflect fully all available fundamental information, actual market behaviour often deviates from this ideal. Behavioural finance provides a framework for understanding these deviations by emphasizing the role of cognitive biases, limited attention, and psychological tendencies in shaping investors' decisions.

The findings of this thesis demonstrate that momentum is a robust and widely documented 'anomaly' across different markets, time periods, and asset classes. Empirical studies consistently show that stocks with strong past performance continue to outperform in the short and medium term, while poorly performed stocks continue to underperform. This pattern is difficult to reconcile, especially with the weak form of the EMH, which states that past price data should not predict future returns.

The empirical evidence on momentum raises important questions about the extent to which markets are truly efficient. Even if the principles of the EMH hold true in theory, it is hard to demonstrate that investors behave perfectly rationally in practice. Deviations from rationality can occur consciously, for example through manipulation, fraud, or noise trading, or unconsciously as a result of psychological and behavioural patterns or a lack of knowledge.

At the same time, advances in machine learning and artificial intelligence provide new tools for analysing investors' behaviour and detecting patterns that may not be visible through traditional methods. As AI-based models become more integrated into financial analysis, future research will benefit from combining behavioural insights with data-driven approaches to gain a deeper understanding of how market participants process information and how anomalies persist.

Overall, this thesis shows that understanding financial markets requires acknowledging both rational and behavioural components of investor's decision-making. Momentum remains a compelling example of how psychological factors can shape price dynamics in ways that traditional theories fail to explain. As financial markets continue to evolve, incorporating behavioural perspectives is essential to developing more realistic models of investors' behaviour and market efficiency. By recognising the limits of rationality, researchers and practitioners can better anticipate market anomalies and improve decision-making in an increasingly complex financial environment.

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