

A Literature Review of Behavioural Finance

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Abstract. The efficient market hypothesis and behavioural finance theory have been the cornerstone of modern asset pricing for the past 50 odd years. Although both theories are fundamental in explaining modern asset pricing, they are opposing views. The efficient market hypothesis dictates that the price of any asset depends on the information, while the behavioural finance theory dictates that the price depends on the reaction of the market participants to the information. Therein lays the key to the argument influencing modern asset pricing, does price immediately reflect the information or market participants' perception of the information. In this paper, we will critical evaluate the theories influencing the behavioural finance theory. We will review the overreaction/underreaction hypothesis and rational bubbles arguments influencing the behavioural finance theory. In concluding, we find that although the behavioural finance theory has difficulties in testing and the empirical evidence is mixed. Yet it does explain a number of anomalies in the financial world and is a more accurate view of the real world. It is also possible to explain market efficiency using the underreaction/overreaction hypothesis. However, a key advantage of using the efficient market hypothesis is that it is a useful benchmark for regulators and central bankers alike. The lack of a uniformed testable model means that the behavioural finance theory as it stands cannot be used as a benchmark. Conversely, the key to the behavioural finance theory is in its ability to explain the movement from the benchmark. So in essence, both models are required to explain asset pricing.

Keywords. Behavioural finance theory, Efficient market hypothesis, Neoclassical economics, Overreaction/underreaction hypothesis, Rational bubbles

JEL. B13, G02, G03, G12, G14.

1. Introduction: Full reserve banking in brief

In essence, this paper is a study of the theories influencing the asset pricing in the global financial market. In order to understand asset pricing, we must understand the influencing factors underpinning the two fundamental theories of asset pricing: the efficient market hypothesis and behavioural finance theory. As proposed by Malkiel (1962) and Fama (1965), the efficient market hypothesis argues that the price of any asset must immediately reflect fundamental information about the asset. Whereas the behavioural finance theory, as argued by Statman (2008) and Subrahmanyam (2007), states that in order to truly understand the movement of asset prices there is a requirement to include the psychology of the market participants.

Essentially, as stated by De Bondt (2000), there are three perspectives on asset pricing: “the price is right” view proposed by Malkiel & Fama (1970), the price is driven by animal spirit view of Keynes (1936) and any uptrend in an asset price must eventually come down resembling Newton’s law of universal gravitation. Interestingly the third perspective is the key to understanding the empirical studies

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of behavioural finance. Some of the issues regarding the pricing of assets cannot be addressed without a reference to the behavioural finance theory. A criticism (for example De Bondt et al. (2008) and Kourtidis et al. (2011)) often put against the neoclassical economics model and in particular, the efficient market hypothesis is that market participants are homo-sapiens and not homo economics. Hence, in order to address these issues there is a requirement to understand the psychology of the market participants. This led to the alternative theory of behavioural finance being put forward by Statman (2008) and Subrahmanyam (2007) amongst others. A key notion in behavioural finance theory as put by Bernard Baruch is:

“What is important in market fluctuations are not the events themselves, but the human reactions to those events.” (Lee et al., 2002, p. 2277).

One of these issues is the price deviation from the fundamental value. As the comment from Bernard Baruch above hints, the key to understanding this deviation is the reaction of the market participants. This lends itself to the overreaction hypothesis as suggested by Barberis et al. (1998), Daniel et al. (1998), Hong & Stein (1999) and De Bondt (2000). This leads to another issue, the existence of bubbles, which causes the asset price to temporarily deviate from the fundamental value in the short to medium term as illustrated by Kindleberger & Aliber (2005). This paper will open with brief overview of the behavioural finance theory. This will be followed by an in depth review of the overreaction/underreaction hypothesis before continuing on to rational bubbles. The final part is the conclusion.

2. The Theory of Behavioural Finance

In essence, De Bondt et al. (2008) and Kourtidis et al. (2011) argue that there is a necessity to understand the psychology of market participants in order to provide an explanation of market abnormalities, such as asset price bubbles and crashes, and comprehend the efficiency of the financial markets. This would seem to suggest it is difficult to fully understand and research the global financial market without reference to the behavioural finance theory. In addition, as hinted by Kourtidis et al. (2011), the obvious existence of irrational market participants making random transactions in the market can only be adequately explained by taking account of behavioural factors. As stated by Barberis & Thaler (2003), the impact on the price from these irrational market participants can be long-lived and substantial. According to Barberis & Thaler (2003), these two issues (i.e. the psychology and the long-lived impact of irrational market participants) form the building blocks of behavioural finance.

As stated by Kourtidis et al. (2011), whereas traditionally financial theories examine how people behave with respect to wealth maximization, behavioural finance is interested in how people “*actually*” behave in a financial environment. Essentially, as defined by De Bondt et al. (2008) and Statman (2008) behavioural finance is the psychological study of the market participants and their interaction with the financial markets where the market participants may be individual households or organizations. As stated by De Bondt et al. (2008) the behavioural finance theory is not necessarily based on the assumption of rational market participants and efficient markets. An important factor in the behavioural finance theory, indicated by Statman (2008), is that market participants are assumed to behave normal in the sense that they act rational but with a limited information set. As a result, markets are not efficient but hard to beat. The main idea influencing the behavioural finance theory is a number of behavioural factors influences market participants, to fully understand this reaction of market participants there is a need to research these behavioural factors. Kourtidis et al. (2011) state there are many behavioural factors highlighted in the literature on behavioural finance that

explain the behaviour of market participants in the financial market. However, they limit their study to four major behavioural factors in analysing the market participants' behaviour in the financial market: over-confidence, risk tolerance, social influence and self-monitoring.

According to Subrahmanyam (2007) there seems to be evidence to suggest that the assumptions and models underpinning the behavioural finance theory are plausible. He states there is evidence to suggest that non-risk based factors influence the predictions of returns more than risk-based factors. There also seem to be evidence to suggest that psychological hypotheses about market participants' biases can be tested in an ex-ante manner. And although the evidence seems to be suggesting that markets are inefficient and predictable patterns do exist, this does not mean that individual market participants can make large excess returns. However, there is evidence that institutional market participants are able to take advantage of these predictable patterns in the financial markets. He argues that although there is evidence suggesting that irrational agents do influence the market in the short run, however there is also strong evidence that irrational agents do influence the market in the long run.

As hinted by Subrahmanyam (2007), there is evidence to suggest that asset prices are influenced by a reference price and the disposition effect. This evidence seems to be pointing towards the existence of a pattern in the trading activity of individual market participants. Moreover, as he hints although there is evidence to suggest that market participants seem to be constructing their portfolios from a limited number of simple strategies like locality, knowledge and word of mouth. However, there seem to be a lack of emphasis in the literature on portfolio choice of market participants. Another key factor as stated by Statman (2008) is that the hypotheses underpinning the behavioural finance theory, such as the disposition hypothesis which predict market participants will realize rapid gains but defer losses, are testable. Thus meaning they can be rejected or accepted depending on the analysis of the data and have been shown by many empirical studies to be capable of accurately predicting market participant's behaviour.

3. The Overreaction/Underreaction Hypothesis

A key assumption of the efficient market hypothesis is that current prices should fully reflect all information on the asset as hinted by Fama (1965) and Malkiel (1962). There is an issue with this statement in that the current price does not reflect the information but the sentiment of the market participants with respect to the information as suggested by De Bondt (2000) and Daniel et al. (1998) among others. Therein lays the key to understanding the overreaction hypothesis (as hinted by Barberis et al. (1998), Daniel et al. (1998), Hong & Stein (1999) and De Bondt (2000)); since market participants have different perspectives on how to interpret the new information, therefore the price could deviate from the fundamental value. Essentially, as hinted by De Bondt (2000), the overreaction hypothesis states that sometimes market participants tend to disproportionately react to information (fundamentals and news) causing a temporarily and dramatic deviation from the fundamental value. Usually the price does revert to the fundamental value within a short period of time as market participants digest the information.

In essence, according to De Bondt (2000), most overreactions are due to errors in market participants' forecasts. A common issue is that market participants are often upbeat during bull markets and gloomy during bear markets, this is reflected in their perspectives of the asset price. Another issue is the problem of overestimation of the information on the asset during the issuance or initial public offering stage by the agents. According to Barberis et al. (1998), a key factor in the

overreaction hypothesis is that a sequence of good or bad news can lead to an overreaction by market participants assuming the continuation of the trend. Daniel et al. (1998) suggest there is a differentiation based on whether the information is public or private. Thus meaning market participants are overconfident in their private information leading to an overreaction in the market. Whilst in general they tend to underreact to public information. Moreover, as discussed in Barberis et al. (1998) the evidence seems to be pointing at some market participants' conservative attitude to updating their model incurring the underreaction hypothesis.

However, as Hong & Stein (1999) highlight it is essential to analyse the interaction between heterogeneous market participants. They analyse two types of bounded rational market participants: momentum traders and news watchers to illustrate the effects on one another. The results seem to be suggesting that when news watchers pick up new information, in general they underreact. This is mainly due to the gradual diffusing of information and the assumption that they do not observe prices. When short run momentum traders enter the market, seeing a chance to profit, instead of pushing the price towards the fundamental value, they cause an overreaction to any news. While in the short run market participants could make a profit, in the long run they make losses due to the price exceeding the long run equilibrium price. According to Hong & Stein (1999), the inclusion of well-informed fully rational arbitrageurs does not eliminate the effects of other less informed and rational market participants. Thus meaning the overreaction continues to have an impact on the price.

Recent empirical evidence paints a mixed picture for the overreaction/underreaction hypothesis, in Spyrou et al. (2007) they find a split between large and small capitalization stocks in the London Stock Exchange. Large capitalization stocks were consistent with the efficient market hypothesis, while medium to small stocks seem to underreact to news shocks for many days. This underreaction is unexplained by risk factors or any other known effect.

A relevant factor raised by Fakhry & Richter (2015) and Fakhry et al. (2016) regarding the efficient market hypothesis is that during some highly volatile periods some markets seem to be rejecting the null hypothesis of the market being too volatile to be efficient. As hinted by Kirchler (2009), the underreaction/overreaction hypothesis provides one possible explanation, which suggests that market participants' reaction leads to overvaluation or undervaluation during bulls or bears market respectively. Hence, a highly volatile period with instances of both a bear and bull market would give the impression of an efficient market.

However, contrary to the two previous articles, Lobe & Rieks (2011) find significant evidence of short-term overreaction in the Frankfurt stock exchange is not limited to small capitalization stocks. The explanation seems to be in the anomalies and stock characteristics. However, transaction costs and unpredictable markets mean that market participants may not be able to exploit these effects. This means that due to the unforeseeable direction of the reaction and the existence of transaction costs prohibiting the implementation of consistent profit making strategies, they conclude the evidence seem to be suggesting no violation of the efficient market hypothesis.

4. A Review of the Effects of Rational Bubbles

Essentially, as hinted by Barlevy (2007) the popular notion is bubbles are initiated by rapid upwards pressures on the price of a particular type of asset or index in a short interval of time, eventually causing downward pressures to correct the price or more dangerously a collapse in the price. In simple terms, as hinted by Blanchard & Watson (1982), a popular notion defines a bubble as a price deviation

from the fundamental value that is apparently unjustified by the information available at the time. This was evidence in the technology boom of the late 1990s to early 2000s and housing market boom of the early to mid-2000s. As illustrated by Kindleberger & Aliber (2005), history is filled with such episodes, the first recorded bubble often referred to as the Dutch tulip bubble of the 1630s, the South Sea Company bubble of 1719-1720 and the US stock market bubble of the 1920s, which ended with the Wall Street crash of 29th October 1929.

However, as Barlevy (2007) argues this popular definition is ambiguous about the scale and length of time of a bubble. At the heart of this argument is the fact large price swings could occur under normal market conditions due to shifts in supply and demand. An example is an asset with cyclical changes in demand, therefore causing dramatic price changes. These price changes are sometimes known as fads. In essence, as Barlevy (2007) states many economists define a bubble as a rapid upwards deviation from the fundamental value.

As noted by Blanchard & Watson (1982), therein lays the difference between economists and market participants. Economists believe that any deviation from the fundamental value is evidence of irrational behaviour whereas market participants believe extraneous events could influence the price of any asset or index. In other words, “crowd psychology” is an important element in the behaviour of asset pricing as pointed by Blanchard & Watson (1982). And as Brunnermeier (2001) highlights, there is empirical evidence provided by Shiller (1979) among others of excess volatility in asset prices meaning prices deviate from their fundamental value more than predicted by the efficient market hypothesis. This evidence would suggest there could be rational deviation from the fundamental value i.e. rational bubbles. Rational bubbles appear in asset prices

“If market participants are willing to pay more for the stock than they know is justified by the value of the discounted dividend stream because they expect to be able to sell it at an even higher price in the future, making the current high price an equilibrium price” as defined by Gurkaynak (2008, p. 166).

Furthermore, as Blanchard & Watson (1982) point rational behaviour and expectation does not imply that prices must follow fundamental values. Of course, there is some evidence of irrational behaviour in the market that could cause irrational bubbles for a survey of this type of asset price bubbles see Vissing-Jorgensen (2004).

As stated by Abreu & Brunnermeier (2003), the efficient market hypothesis implies that bubbles do not exist by virtue of the existence of rational well informed and financed arbitrageurs guaranteeing that any potential mispricing will be corrected (Fama, 1965). However, as Abreu & Brunnermeier (2003) argue some rational arbitrageurs also like to take advantage of the bubble to further their earnings while the bubble last, hence ideally leaving the market just before the crash. Nevertheless, since each rational arbitrageur have their own model and assumption of when to leave this leads to asymmetrical information and different viewpoints. The key argument against the assumption of the existence of rational and financed arbitrageurs is this incoordination between the very agents that will supposedly correct any mispricing in the assets. Moreover, as Abreu & Brunnermeier (2003) illustrate many supposedly rational agents have lost out on huge profits or made huge losses by mistiming their exit. As exemplified by the different cases of Julian Robert, Tiger Hedge Fund, and Stanley Druckenmiller, Quantum Fund, during the tech bubble of the late 1990s early 2000s see Abreu & Brunnermeier (2003, p. 175).

5. Conclusion

In concluding, it is hard to explain the recent financial and to a certain extent sovereign debt crises without referring to the behavioural finance theory. In essence, the psychology of humans dictates that under normal conditions each market participant would interpret the given information about a financial asset differently. The nature of financial crises is such that information becomes increasingly asymmetrical and news has a greater impact than fundamentals. Hence, as illustrated throughout this section, there is ample evidence suggesting that financial markets are governed by the reaction of market participants to events such as De Bondt et al. (2008), Kourtidis et al. (2011) and Lee et al. (2002). Another factor highlighted by Bernanke (2010) and Barberis (2011) is the possibility of increases in asset prices beyond the fundamental value dictated by the information over a period. These two factors point to the existence of asset price bubbles and overreaction hypothesis influencing the behaviour of prices and hence volatility.

As illustrated earlier, evidence in the financial markets suggest a mixed picture for the overreaction hypothesis see Spyrou et al. (2007), Kirchler (2009), Lobe & Rieks (2011) and recently Fakhry & Richter (2015) and Fakhry et al. (2016). On the other hand, the evidence seems to suggest that market participants do react to certain extreme events such as the 11 September 2001 terrorist attacks, Lehman Brothers Bankruptcy and the Japanese tsunami of 2011. This seem to be explained by Knightian Uncertainty which dictates under certain market conditions market participants are faced with immeasurable systemic risks which lead to market participants overreacting as hinted by Caballero & Krishnamurthy (2008). In essence, this evidence seems to be suggesting that it is news and not fundamentals influencing the financial markets during any financial crisis. In addition, the overreaction/underreaction hypothesis may provide a part of the explanation for the asset price bubbles.

There is ample evidence throughout history of asset price bubbles, yet a fundamental weakness of the efficient market hypothesis is its assumption that bubbles cannot exist due to the existence of rational well-informed and financed arbitrageurs see (Fama, 1965). However, as illustrated earlier in this section, there is a hint of catch 22 for these arbitrageurs that lead to huge losses or miss-opportunities see (Abreu & Brunnermeier, 2003). This highlights the difficulties of planning strategies during episodes of asset price bubbles, since it is very difficult to know when an asset price bubble will burst. The problem is complicated by the existence of mixed evidence in the detecting of asset price bubbles see (Gurkaynak, 2008).

In concluding, behavioural finance is an essential theory in the explanation of the behaviour of asset prices. This is highlighted by the existence of homo-sapiens in the global financial market as the decision makers. In essence, neoclassical economics and the efficient market hypothesis do not explain certain types of behaviours in the financial market such as asset price bubbles and market participants' reactions to news or information. However, the mixed empirical evidence, especially in the case of testing for asset price bubbles and to a lesser extent the overreaction/underreaction hypothesis, seem to be pointing towards a lack of econometrical tests and understanding of how market participants react to certain events and information.

In concluding, the efficient market hypothesis and behavioural finance theory explain different parts of asset pricing. However, as things stand at present, both have strong weaknesses. This means in order to understand the pricing of assets there is still a requirement to use both fundamental theories. Coincidentally, the

behavioural finance theory could be extended to explain the efficient market hypothesis by using the overreaction/underreaction steady state and the key is that this is testable. So in essence the behavioural finance theory is a more complete and therefore theoretically superior theory of asset pricing.

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