



HIGH LEVEL ANALYSIS

Behavioural Finance - analysing the unpredictable and irrational behaviour of investors - has become an increasingly popular discipline in the modern financial literature. This science weakened the foundations of rationale investing and shed the light on maximising wealth under irrational markets. The purpose of this paper is going through a few common-sense rules helping investors to maximise portfolio returns in irrational markets.

1. Introduction	1
2. Understanding Market Efficiency	1
3. Efficient Markets, a Few Key Milestones	2
4. The Emergence of Behavioural Finance	3
5. Investing in Irrational Markets	3
6. Conclusion	4
7. References	4

1. Introduction

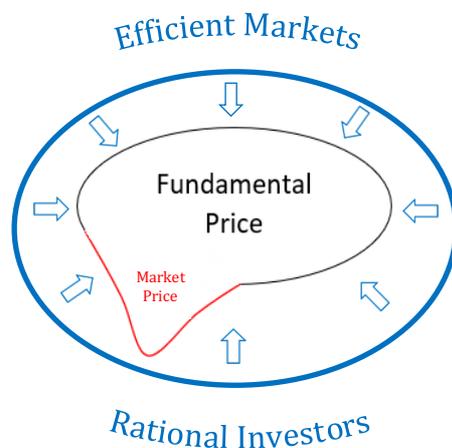
A key aspect of asset valuations in modern financial economics is the Efficient Market Hypothesis (“EMH”) suggesting that the market price of an asset equals its fundamental value. If rationale markets are a cornerstone of finance, research papers progressively started documenting market inefficiencies like, for instance, the biased market response to economic events like dividend distributions. The fact that rational investors can adopt unpredictable or irrational behaviours led to the emergence of a brand-new field of study, the behavioural finance. This increasingly popular discipline weakened the foundations of rationale investing and shed the light on maximising wealth under irrational markets. The purpose of this paper is stressing out a few common-sense investment rules that can be applied in irrational markets.

This paper is organised around a few key Sections, the first one is dedicated to a brief definition of market efficiency, the second one highlights the literature related to efficient markets and theoretical focus, the third Section focuses on the emergence of behavioural finance, the fourth Section is dedicated to investing in irrational markets, the last Section is devoted to a conclusion.

2. Understanding Market Efficiency

The market efficiency theory suggests that the market price of an asset is an unbiased estimate of its fundamental value. The price may sporadically deviate from its fundamental value, but the deviation must follow a random walk, *i.e.* must be temporary, non-correlated with any observable variable and no investors can beat the market continuously. A key assumption of the EMH is assuming that market participants are rational, and that any arbitrage opportunity is automatically traded, leading prices towards their long-term equilibrium. In those markets, participants only are remunerated for the additional unit of Risk they bear.

Three forms of market efficiency are defined, the weak form assumes that the current market price of an asset includes all past information. The semi-strong form considers that the price reflects not only its historical prices, but also all public information. The strong form considers that all information, public and private is included into the price, and that there are no arbitrage opportunities for investors.



3. Efficient Markets, a Few Key Milestones

Market efficiency has been discussed in the modern literature widely; the purpose of this Section is highlighting a few key milestones around the efficient market topic.

Despite that a prominent Italian Mathematician, Girolamo Cardano, was the very first to approach the notion of efficiency in the 16th century, the first real concept of market efficiency was introduced by Louis Bachelier in 1900; he worked on stock and commodity prices to find out if prices randomly fluctuated or not.

John Maynard Keynes introduced the risk-reward concept in 1923, arguing that investors are rewarded not by knowing better than the market but by the additional units of Risk they bear.

In 1933, Alfred Cowles, an American Economist and Businessman, analysed the performance of investment professionals and concluded that market forecasters cannot forecast actually market prices.

Fama defined an efficient market for the first time in 1965 and concluded that financial markets indeed follow a random walk. A random walk presents important challenges both for the technical and fundamental analysis; it is a key contributor in favour of efficient markets because it assumes it is impossible to outperform markets without assuming additional Risk.

In 1970, Fama published "Efficient Capital Markets: A Review of Theory and Empirical Work", in which he defined a market where prices always fully reflect all information.

In 1980, Grossman and Stiglitz exposed the impossibility for a market to be perfectly informationally efficient, mainly because information is costly, and prices cannot perfectly reflect information which is available; if it would be, this would mean that investors spending resources to obtain information would receive no compensation for that.

In 1982, Milgrom and Stokey showed that under certain circumstances, the receipt of private information cannot create any incentives to trade; speculation relies on inconsistent plans and thus is not ruled by rationale expectations.

Schleifer published a paper in 2000 which questioned the assumptions of investors rationality and perfect arbitrage. The same year, Shiller published the first edition of "Irrational Exuberance" which challenged the EMH, by demonstrating that markets cannot be explained historically by the movement of company earnings or dividends.



HIGH LEVEL ANALYSIS

4. The Emergence of Behavioural Finance

Under the EMH, the market price of an asset should represent the discounted value of its future cash-flows, or its fundamental value and any deviation should be temporary; this is a core statement of the theory. As a matter of fact, markets not always react rationally, and market prices often are far from the fundamental values of underlying assets. If market parameters like the liquidity premium may sometimes explain this phenomenon, deviations cannot always be explained by rationale arguments. A new field of study dedicated to study those irrational behaviours recently emerged, the Behavioural Finance. Robert Shiller highlighted a few key theories from psychology, sociology, and anthropology that could explain the irrationality of investors.

- *Trouble to Admit Errors*: There is a human tendency of not accepting having made errors, and not putting such errors into a large perspective. People tend to minimize or forget past errors, leading them to accept gambling again and reproduce past errors.
- *Anchoring*: It has been observed that when people must make a quantitative assessment, it is directly influenced by suggestions.
- *Mental Compartments*: There is a human tendency to place specific events into mental compartments based on superficial attributes. Rather than considering the scope as a whole, they consider small decisions separately.
- *Over-Confidence*: People often tend to show excessive confidence about their judgements, this may lead investors to over or under-react to news.
- *Prospect Theory*: Investors do not necessarily process information the same way depending if they are losing or winning money, which goes against maximising the utility function. It is observed that people tend to be more Risk-averse in situations where they want to settle gains and engage more in Risk-seeking behaviours in situations where they can limit their loss.

Shafir, Simonson and Tversky (1933) also considered the impact of arguments and reasoning into decision-making. They demonstrated the importance of argumentation into the decision-making process and that decision makers often seek and construct reasons to resolve the conflict and justify their choice. Asch (1956) also defined the so-called Herd Behaviour, *i.e.* when one asks an individual a question, the latter would not conform to something incorrect; but if a group of individuals all answer incorrectly to a question, the individual would conform and answer incorrectly.

5. Investing in Irrational Markets

It can be tricky to invest in markets with an irrational component. There is no *panacea* to maximise profits into such markets, but a few common-sense rules are good to apply:

- *Be Quantitative*: You may pick a stock because you have a strong conviction about it, but don't gamble with your entire portfolio. Try to invest using facts and figures, collect as much information as you can before investing. Most of information is usually public and doesn't require costly access to specific databases.
- *Diversify Your Portfolio*: This is one of the most quoted investment advices; spread your wealth and don't put all your eggs in one basket, don't invest into a single stock or sector. You can push the diversification as far as you want, by assets, by geographical location, by sector, by currency, *etc.*
- *Keep Using the Same Investment Criteria*: When building your portfolio, keep monitoring the same metrics for similar assets, *i.e.* if you decide to monitor PB and PE ratios for a stock, keep monitoring those metrics for all stocks you want to add to your portfolio, to make the comparison possible.
- *Invest at Least for a Mid-Term Horizon*: The mispricing of an asset tends to be a short-term event, except for financial bubbles that can take few years to burst. Investing with mid-term or long-term objectives enables investors not considering short-term volatility, analysing news with more objectivity, and not being impacted by short-term markets frenzy.



HIGH LEVEL ANALYSIS

- *Filter the Information Flow:* Information comes from everywhere nowadays and can sometimes be contradictory, *i.e.* social media, traditional media, *etc.* It is important not being squeezed by this continuous flow of information; decide what are the sources you want to use and stick to them to reduce the noise that could pollute your investment decision.
- *Carefully Manage your Cost Structure:* You may face several fees when investing: trading fees, brokerage fees, leverage fees, custodian fees, *etc.* Invest in a sensible way and minimize your cost structure to maximize your long-term profit. As a matter of fact, people don't like paying high fees just for the pleasure, but it is observed that investors may prefer to stay in their comfort zone and sticking to a provider rather than looking for better opportunities.

6. Conclusion

Despite that analysts do try to model inefficient markets for a few decades already, behavioural finance remains by essence random and cannot consequently be modelled with precision. Within this paper, we expected to highlight a few rules that could help to maximise portfolio returns in irrational markets. Those rules are just common-sense guidelines, but despite being basic, the history reveals that following those recommendations can help better dealing with irrational markets and maximising the investor's wealth.

7. References

- Asch S.E., 1956, "Studies of Independence and Conformity I: A Minority of One Against a Unanimous Majority", *Psychological Monographs*, Volume 70(9), p.9.
- Bachelier L., 1900, "Théorie de la Spéculation", *Annales Scientifiques de l'École Normale Supérieure*, Série 3, Volume 17, pp.21-86.
- Cowles A., 1933, "Can Stock Market Forecasters Forecast?", *Econometrica*, Volume 1, pp. 309-324.
- Eades K.M, Hess P, and Han Kim E., 1985, "Market Rationality and Dividend Announcements", *Journal of Financial Economics*, Volume 14(4), pp. 581-604.
- Fama E. F., 1965a, "Random Walks in Stock Market Prices", *Financial Analysts Journal*, Volume 21(5), pp. 55-59.
- Fama E. F., 1970, "Efficient Capital Markets: A Review of Theory and Empirical Work", *The Journal of Finance*, Volume 25(2), pp. 383-417.
- Grossman S. J. and Stiglitz J. E., 1980, "On the Impossibility of Informationally Efficient Markets", *The American Economic Review*, Volume 70(3), pp. 393-408.
- Keynes J.M., 1923, "Some Aspects of Commodity Markets", *The Manchester Guardian Commercial: European Reconstruction*, pp.784-786.
- Mandelbrot B., 1962, "The Variation of Certain Speculative Prices", *The Journal of Business*, Volume 36, pp. 394-419.
- Merton R., 1985, "On the Current State of the Stock Market Rationality Hypothesis", *Working Paper*.
- Milgrom P. and Stokey N., 1982, "Information, Trade and Common Knowledge", *Journal of Economic Theory*, Volume 26(1), pp. 17-27.
- Rendleman R.C., Jones C.P. and Latane H.A., 1982, "Empirical Anomalies Based on Unexpected Earnings and the Importance of Risk Adjustments", *Journal of Financial Economics*, Volume 10(3), pp. 269-287.
- Sewell M., 2011, "History of the Efficient Market Hypothesis", *Research Note*.
- Shafir E., Simonson I. and Tversky A., 1993, "Reason-Based Choice", *Elsevier Science Publishers*, Volume 49(1-2), pp. 11-36.
- Shiller R.J., 1998, "Human Behavior and the Efficiency of the Financial System", *NBER White Paper*, Nr 6375.
- Shiller R. J., 2000, "Irrational Exuberance", *Princeton University Press*.
- Shleifer A., 2000, "Inefficient Markets: A Introduction to Behavioral Finance", *Oxford University Press*.