International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Why Using Behavioral Approaches to Understand Stock Price Behaviour Makes Sense

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ABSTRACT

In much of the financial literature the price of a security is determined by calculating the net discounted present value of the future stream of cash flows,where the discount rate is the expected rate of return on the security estimated using pricing models like Capital Asset Pricing Model (CAPM) or its variants. Investors in the CAPM framework are assumed to be rational and risk-averse. In reality, investors are not always rational. Biases in investor's behaviour leading to inertia,overconfidence, herd behavior, and loss aversion can cause investors to make irrational decisions.By explicitly taking into account the psychological underpinnings of investor's behaviour, a more realistic approach to study stock price behaviour can be established.

Keywords: Neoclassical Approach, Behavioral Approach, Asset Pricing Models, Behavioural Biases

1. INTRODUCTION

In finance, researchers have used various approaches to study stock market behaviour.Broadly speaking we can identify three different frameworks for understanding stock price formation–the neoclassical , the behavioural and the technical.

The neoclassical perspective employs different financial indicators that represent the company's well-being and the state of the economy to assess a stock's valuation.This approach to economics relies on the principles of utility maximization, equilibrium, and efficiency. The optimizing assumptions of neoclassical approach leads to a mathematically appealing framework that has been used to study and test various forms of economic behavior. However because it imposes exacting assumptions on the behaviour of economic agents, its usefulness in understanding various market phenomena is limited.On the other hand,the behavioural approach by explicitly taking into account cognitive limitations and behavioural biases gives a more realistic understanding of the stock market. The technical analysis uses historical data on price and volume to predict future price movements. The pattern in these data is identified and using various tools like moving averages, Relative Strength Index (RSI), Bollinger Bands, price forecasts are made and potential reversal points identified.

In this paper we highlight the limitations of the neoclassical approach and argue why the behavioural approach has a greater merit in understanding the various stock market phenomena.

2. NEOCLASSICAL APPROACH

In financial literature, the concept of stock market efficiency is discussed at three levels. The weak form of efficiency asserts that markets operate efficiently when historical price movements do not assist

investors in developing profitable investment strategies. The semi-strong form of efficiency indicates that prices incorporate all publicly accessible information, making it impossible for investors to earn excess returns by trading based on any public information. The strong form of efficient markets claims that the current price embodies all pertinent information, meaning that even with access to private information, investors cannot surpass the market's performance.

In an efficient market the real price P_t of a share at the beginning of the period t is given by $P_t = \sum_{k=0}^{\infty} \gamma^{k+1} E_t D_{t+k}$.....$0 < \gamma < 1$

Where D_t is the real dividend paid at the end of time t and E_t represents mathematical expectation conditional on information available at time t and γ is the constant real discount factor. Further, $\gamma = \frac{1}{1+r}$

Where 'r' is the constant real interest and is determined using a suitable asset pricing model. The underlying equation of the valuations model indicates that if investors expect a change in the future stream of dividends, stock prices will change. The expectations regarding future stream of dividends may vary across investors. The value of 'g' is subjective and will be influenced by the 'mood' of the market. Stock price will fluctuate if the market estimate of the expected rate of growth of dividends, 'g' changes. Similarly the discount factor would differ depending on the assumptions guiding the choice of the asset pricing model.With 'r' and 'g' differing across individuals, investors may take different positions regarding the price of a stock. For some the current price may appear to be far above the 'true value',whereas for others it may be very attractive at the current valuation. Therefore, conclusions regarding market efficiency become dependent on the chosen model for expected returns. Empirical validation of these pricing models would indicate a support for the risk- return relationship posited by the model as also the market price being efficient. However if the specific asset pricing model is rejected, it becomes challenging to determine whether the risk-return relationship indicated by these models is flawed or if the market itself is inefficient.

2.1 ASSET PRICING MODELS

Though Capital Asset Pricing Model (CAPM) is the most popular asset pricing model researchers have used its various versions like the conditional CAPM, Intertemporal CAPM (ICAPM),multifactor asset pricing models and Arbitrage Pricing Theory (APT) to estimate the necessary rate of return for a security. The CAPM was simultaneously and independently developed by Sharpe (1964), Lintner (1965) and Mossin (1966) building on the seminal work of Markowitz (1959) who presented portfolio selection as an outcome of economic agents maximizing utility under conditions of uncertainty. The fundamental premise of this theory is that assets with equivalent risks should yield the same anticipated returns. CAPM introduced the concept that in a market equilibrium, assets earn returns above the risk-free rate that escalate with their risk level, with the key factor influencing risk premiums being the covariance of the asset with the so-called market portfolio i.e. the beta (β) of the asset rather than the asset's intrinsic risk.

A key assumption of CAPM is that the market consists of risk-averse investors who engage in optimal diversification to maximize potential returns. The basic formulation of CAPM further asserts that all investors share identical expectations regarding the returns of various securities, as well as the variances and covariances of these returns. The model overlooks transaction costs and taxes altogether. Furthermore, its basic structure simplifies the intricacies of real-time income and spending choices. It is derived under the assumption that all investors face the same single-period investment horizon during which the real interest rate remains constant. It is assumed that individuals can borrow or lend at that rate without any risk, regardless of how much they need to optimize their portfolio choices.

Modifications to the basic formulation of CAPM to tackle some of these unrealistic assumptions resulted

in Consumption CAPM developed by Breeden (1979). In this version it is recognized that individuals primarily maximize their consumption over lifetime and not merely return on their assets. It thus becomes important to consider the variance in the returns of assets not just due to the variance in market portfolio but also due to variation in earnings from work in making investment decisions.The assumptions of single period investment horizon and a constant rate of interest on a risk free asset are also not very realistic. The Intertemporal Capital Asset Pricing Model of Merton (1973) assumes that investment and trading occurs continuously over time and the interest rate fluctuates.This model, therefore, has two 'betas'-β_1 and β_2, both measure systematic risk associated with the stock. While β_1 captures risk due to covariance of stock returns with market portfolio, β_2 the risk due to correlation of returns with the movements in the risk-free rate.

Fama et al. (1993) developed a three factor model for expected returns by including size and book-to-market value as the two additional factors apart from 'beta' to measure the portfolio risk. The book-to-market factor is an indicator of the health of the firm and high values of this factor implies greater risk that needs to be compensated with higher expected returns. Similarly stocks of small firms are more risky than those of big firms and should have higher expected returns. In a later study (Fama, et al., 2015) they add two more factors namely profitability of the firm and investment levels to get a more comprehensive measure of risk. Firms that have low profitability and invest heavily will be perceived to be more risky and the investors need higher expected returns to invest in such firms.

A more generalized asset pricing framework is the Arbitrage Pricing Theory (APT) developed by Ross (1976). APT assumes that multiple factors influence the return of an asset. These factors could be macroeconomic variables such as inflation, interest rates, industrial production, or GDP growth or market-specific variables. The APT postulated that a portfolio constructed by combining short and long positions in such a way that both risk and the net investment of the portfolio are zero must earn zero return in a market with no transaction costs. Simply speaking, what this pricing model implies is that if investors can make profit by simply arbitraging between different stocks, and that too without making any investment, before long such a profit opportunity would be detected and eliminated by the actions of other investors.APT is a more flexible model as it allows for multiple factors and more suitable for empirical exercises as it can be adapted to different economic conditions and asset types.

3. BEHAVIORAL APPROACH

The neoclassical perspective, which focuses on rationality and the maximization of utility by individuals, has significant theoretical attraction but limited practical applicability. While economists have recognized since the time of Adam Smith the impact of psychological factors on human behavior, substantial efforts to integrate behavioral biases into economic analysis emerged much later. In a world filled with uncertainty, individuals function under many resource constraints. As a result, they often resort to various heuristics or rules of thumb to make decisions. Individuals often lack full understanding of the phenomena in hand and have neither the time nor the ability to process all the relevant information to arrive at constrained optimisation. It is unrealistic to expect individuals to behave consistently rational in the face of rapidly changing situations. It is therefore important to acknowledge that individuals possess, at best, limited rationality. Simon (1955) coined the term 'bounded rationality' to represent a more accurate view of human problem-solving abilities. Given their restricted time and cognitive capacity, individuals cannot be expected to find optimal solutions to complex problems. Consequently, the narrow assumption of

economic agents acting to maximize their outcomes must be replaced with a more realistic notion of 'satisfying behavior' in the face of cognitive limitations and bounded rationality.

Another assumption that is considered beneficial for optimization models is that, once individuals have identified the optimal choice, they will select it. However, this is not always true. Even when individuals understand what is best for them, they may fail to choose it due to issues with self-control. Furthermore, the belief that individuals are constantly motivated by self-interest does not hold entirely true; people frequently engage in altruistic behaviors, such as donating to charity and participating in volunteer work.

With these revised assumptions, it becomes uncertain whether equilibrium values can be attained. For example, in the capital market, while trades made by rational participants move the market towards equilibrium, the actions of irrational traders can drive it away from this point. Equilibrium prices reflect a weighted average of the perceptions held by both rational and irrational traders, and the impact of each group on price levels depends on their ability to bear risk. It may be a little far-fetched to argue that some irrational traders may overestimate while others may underestimate prices resulting in the weighted average price being close to rational level. Market sentiments are often all pervasive and markets get dominated by a bull or bear run. As a result, arbitrage opportunities may not fully correct mispricing. The process of arbitraging is not always efficient, as it is difficult for an investor to ascertain whether others have recognized and acted on the mispricing. Additionally, shifts in investor sentiment, which are often unpredictable, can cause prices to drift further away from fundamental values.

Chronic mispricing can also happen when crucial public information is overlooked or improperly interpreted by everyone, leading to instances where market prices consistently diverge from fundamental values. Assuming that errors are independent across individuals and will naturally offset in equilibrium is misleading, as individuals often share similar biases. Neoclassical economists who advocate for the existence of equilibrium believe that individuals who persistently and consistently make the same mistakes will eventually learn from them. However, experimental research has demonstrated that learning may not occur, even over indefinite timeframes. Since there are opportunity costs associated with learning, even a wholly 'rational' learner might opt not to explore alternatives, remaining in a non-optimal equilibrium simply because the cost of experimenting is too high. Furthermore, the duration required to reach an equilibrium strategy can be exceedingly long, particularly in a changing environment.

Consequently, markets may find themselves stuck in a state of perpetual non-convergence.

3.1 BIASES IN BELIEFS AND CHOICE

Time limitations, restricted memory, and limited processing ability compel individuals to concentrate on specific segments of the information at hand. The neoclassical perspective posits that price fluctuations are influenced by firm-specific fundamentals such as earnings and dividends, as well as macroeconomic factors like interest rates, and that stock prices incorporate all accessible information. Consequently, it fails to adequately account for the development of asset price bubbles, which occur when asset prices exceed their fundamental worth. In this framework bubbles and market crashes are a result of excessive monetary expansion or a result of external shocks, such as geopolitical events,technological innovations or regulatory changes rather than inherent flaws in the working of the market. Shiller (2000) explores how psychological elements like herd behavior, social contagion, and irrational expectations regarding future profits contribute to the emergence of asset price bubbles. In a later paper, coauthored with Akerlof he asserts that bubbles frequently arise from human behavior that markedly diverges from the rational agent model prevalent in economics (Akerlof,et al.,2009). Ackert et al. (2010) employ experimental economics and examples from financial markets to illustrate how emotions and cognitive biases lead to irrational

market behavior. They demonstrate how psychological biases, such as overconfidence and loss aversion, play a role in the creation of asset price bubbles.

Under the presumption of market efficiency, it is also challenging to explain price trends or the momentum effect, along with anomalies like value investing. Price momentum may result from investors demonstrating herd mentality, driving up asset prices beyond their intrinsic values, even when fundamentals suggest the asset is overpriced. Investors typically presume that recent trends will persist, leading them to overestimate the probability of a specific outcome - a concept known as representativeness. Jegadeesh et al. (1993) provided evidence that momentum investing strategies yield abnormal returns in various stock markets. Investors might overestimate their ability to anticipate stock movements, resulting in excessive trading and risk-taking, reflecting their overconfidence bias. The behavioral perspective acknowledges that market psychology and investor sentiment significantly influence stock prices. Positive or negative sentiment can sway prices upward or downward, even amid minimal fundamental alterations. For instance, investors may become excessively optimistic during bull markets and overly pessimistic during bear markets, resulting in price fluctuations that fundamental analysis alone cannot elucidate. Barberis et al. (1998) create a model that illustrates how investor sentiment (optimism/pessimism), overreaction, and herding propel prices to unsustainable heights. Akine et al. (2024) examine stock market volatility using a behavioural approach. They find that an increase in rate of interest leads to fall in stock prices due to investors exhibiting loss aversion .Higher consumer confidence generates herding behaviour and optimism and leads to rise in stock prices.

To argue that investors hold a diversified portfolio and combine assets that maximises expected returns for a given level of risk is also not very realistic.Barber et al. (2013) show that individual investors hold undiversified portfolios that underperform standard benchmarks,and in general do not exhibit optimum behaviour in their choice of assets. Investors may have a preference for a certain asset class or a certain sector and may hold a portfolio heavily weighted by these assets.Overconfidence in their ability to pick winners and holding on to losers to assuage their self-esteem results in behavioural biases and portfolios that are a far cry from the optimum.

4. CONCLUSIONS

The behavioral perspective, by recognizing the limited rationality of investors and explicitly factoring in psychological biases in their investment choices, provides a deeper insight into the working of the market, making it more effective for examining stock prices, investor behavior, and market inefficiencies. While the neoclassical framework offers a fundamental basis for financial theory, it encounters difficulties in explaining asset price bubbles and crashes through CAPM and the Efficient Market Hypothesis, which are the foundational elements of modern finance.

REFERENCES

1. Ackert L.F. and Deaves R. 2010. Behavioral Finance: Psychology, Decision-Making, and Markets South-Western Cengage Learning,
2. Akerlof G.A and Shiller R.J. 2009. Animal spirits:How human psychology drives the economy and why it matters for global capitalism. Princeton University Press
3. Akin I, Akin M. 2024. Behavioral finance impacts on US stock market volatility: an analysis of market anomalies. Behavioural Public Policy. doi:10.1017/bpp.2024.13

4. Barberis N., Shleifer A and Vishny R. 1998. A model of investor sentiment. Journal of Financial Economics 49:307-343
5. Barber B. M. and Odean T. 2013 Handbook of the Economics of Finance vol 2, part B, 1533-1570
6. Breeden D.T. 1979. An intertemporal asset pricing model with stochastic consumption and investment opportunities. Journal of Financial Economics 7: 265-296.
7. Fama E. F. and French K.R. 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 33: 3-56.
8. Fama E. F. and French K.R. 2015. A five-factor asset pricing model Journal of Financial Economics. 116: 1-22.
9. Jegadeesh N. and Titman S. 1993. Returns to buying winners and selling losers : Implications for stock market efficiency. Journal of Finance. 48: 65-91.
10. Lintner J. 1965. The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. Review of Economics and Statistics 47: 13-37
11. Markowitz H. 1952. The utility of wealth. Journal of Political Economics 60: 151-158.
12. Merton R.C. 1973. An intertemporal capital asset pricing model. Econometrica 41: 867-887
13. Mossin J. 1966. Equilibrium in a capital asset market. Econometrica 34: 768-783
14. Ross, S. 1976. The arbitrage theory of capital market asset pricing. Journal of Economic Theory 13 : 341-360
15. Sharpe W.F. 1964. Capital asset prices: a theory of market equilibrium under conditions of risk. Journal of Finance 50: 131-155
16. Shiller R.J. 2000. In: Irrational Exuberance. Princeton University Press
17. Simon H. A. 1955. A Behavioral model of rational choice.Quarterly Journal of Economics 69: 99-118.