QUTEFS Publication: The Psychology of Investing: A Behavioural Economics Perspective on CAPM

Have you ever wondered how psychological influences financial decisions? Traditionally, finance is seen as a realm governed by hard numbers of investment returns and risks. Yet, there's a significant shift towards recognising the influence of human behaviour, emotions, and biases. At this intersection, the Capital Asset Pricing Model (CAPM) serves as a fundamental beacon, guiding investors in their quest for understanding the expected return on an investment relative to its risk. Yet, this journey is far from straightforward, as it ventures into the realm where economic theories intersect with the complexities of human psychology.

With a foot in both worlds — economics and psychology — I'm fascinated by how CAPM, was built on the pillars of risk and return, navigates these waters with such similar footing in psychological statistics (Fama et al., 1992). This idea of psychology and CAPM raises compelling questions: How do psychological factors shape our financial decisions? Can the assumptions of CAPM fully capture the nuances of investor behaviour? This post is not just about dissecting a financial model; it's about unravelling the humanism that lie at the very heart of finance.

But first, what is CAPM?

At its core, the Capital Asset Pricing Model hinges on a straightforward yet complicated looking equation (Fama et al., 1992):

$$E(Ri) = Rf + \beta i\ (E(Rm) - Rf)$$

Trust me, while it looks complicated, really $E(Ri)$, represents the expected return on investment (i), Rf stands for the risk-free rate, βi (beta) is the beta of the investment (measuring its volatility relative to the market), and $E(Rm)$ is the expected return of the market.

Essentially, an important part of CAPM is something called “beta.” Beta measures how much the price of an investment goes up or down compared to the market. For example, if the market goes up by 1% and an investment goes up by 1.5%, its beta is higher than 1, meaning it's more volatile than the market. CAPM says that if an investment is more volatile (has a higher beta), it should give you a higher return to make up for the extra risk.

How is CAPM challenged through behavioural finance?

This field, through works like Kahneman's *Thinking, Fast and Slow* and Shiller's *Irrational Exuberance*, highlights the divergence of real-world behaviour from the rational agent model. So, this is where it gets interesting: CAPM assumes everyone in the market is rational. It thinks people always make decisions calmly, looking at all the facts and figures without letting emotions get in the way. However, behavioural finance shows us that people often don't act this rational. Phenomena such as herd behaviour, overconfidence, and loss aversion vividly illustrate how psychological factors can lead to market anomalies CAPM struggles to account for.

For instance:

- **Herd behaviour** means people might buy stocks just because everyone else is, not because the stocks are genuinely a good investment, which can make prices move in ways that don't match with CAPM's predictions.
- **Overconfidence** can lead investors to take on too much risk, thinking they can beat the market, even when their chances are slim.
- **Loss aversion** shows that people hate losing money more than they like making it, which can make them act in irrational ways, like holding onto losing stocks too long or selling winning stocks too soon.

These insights from behavioural finance and economics suggest that market volatility and returns cannot be neatly explained by beta alone. The impact of psychological factors on investment decisions implies that CAPM, while foundational, requires a broader lens to account for the behavioural dynamics at play. Such as Daniel Kahneman and Amos Tversky's Prospect Theory (1974), where people value gains and losses differently, leading to decision-making that prioritises avoiding losses over acquiring equivalent gains. This loss aversion, along with other biases like overconfidence and herd behaviour, illustrates why the CAPM is not all that simple. If investing was a matter of numbers game, the human side of rationality would be irrelevant?

By integrating psychological insights with economic theory, we can begin to see the limitations of CAPM's assumptions in describing real-world market dynamics (Thaler, 2005). This exploration not only helps our understanding of investment risk and return but also opens the door to developing more nuanced models that better reflect the intricacies of investor behaviour and market movements. Despite these critiques, it's important to acknowledge that CAPM remains a foundational element in finance, providing a valuable starting point for understanding risk and return, even as we recognise its limitations in the face of real-world investor behaviour.

Why does all this matter?

Well, our discussion is rooted in a pivotal theory known as the Random Walk Hypothesis, introduced by Burton Malkiel in his seminal 1973 work, *A Random Walk Down Wall Street.* This hypothesis suggests that stock prices evolve in an unpredictable manner, with each price change representing an independent event unaffected by past movements. According to this perspective, attempting to forecast future stock prices is to guess, largely because the number of factors influencing these changes at any given moment renders them random and, thus, fundamentally unpredictable.

The Random Walk Hypothesis challenges not just the predictability of stock prices but also the core assumption of market efficiency held by models like the CAPM (Fama & French, 2004). Market anomalies, such as the low-volatility puzzle where lower beta stocks unexpectedly outperform their higher beta counterparts, underscore this complexity (Baker et al., 20211; Barberis et al., 1998). These anomalies illustrate the critical role that investor psychology plays in financial markets. Therefore, human emotion and decision-making questions the reliability of beta as a sole predictor of returns, highlighting the need for models that can more accurately reflect the intricacies of human behaviour (Shiller, 2015). These psychological factors extend beyond anomalies like the low-volatility puzzle (Baker et al., 2011). Emotional responses and cognitive biases can make beta a less reliable predictor of future returns, as they fail to capture the irrational thoughts of humans that significantly influence investor behaviour. Recent studies, such as those by Zhang et al. (2023), emphasise how traditional financial models overlook the complex reality of investor psychology, which can lead to mispricing and other market inefficiencies.

However, Engelmann and Hollard's (2010) work suggest that market experience plays a critical role in shaping investor behaviour towards rationality. Through the endowment effect repeated market interactions can serve to correct irrational biases. This is particularly relevant in the context of CAPM's limitations, as the concept of adaptability and learning of the human investor, suggesting that the gap between theoretical rationality and observed behaviour might narrow with increased market exposure.

A prime example of CAPM's limitations in real-world scenarios can be seen through the lens of "animal spirits," a term Keynes used to describe the emotional and instinctual drives behind economic decisions (Akerlof & Shiller, 2009. The 2020 market fluctuations, exacerbated by pandemic-related uncertainties, serve as a vivid illustration. During this period, investor behaviour – driven by fear and speculation – led to significant market volatility, deviating sharply from what traditional models like CAPM would predict. High-beta stocks, typically associated with higher risk and expected to perform poorly in such uncertain times, saw their prices driven up by a wave of optimism, while the more stable, low-beta stocks were undervalued, contrary to CAPM's risk-return correlation (Thaler, 2005). This divergence highlights the impact of psychological factors, showing that market dynamics are as much about human behaviour as they are about the fundamentals of finance.

Understanding all these theories, the juxtaposition of these psychological theories against CAPM writes an intriguing narrative: investing is as much about understanding human behaviour as it is about navigating financial metrics. The psychology of investing reveal that market outcomes are not solely the product of risk and return calculations but are deeply influenced by human emotions, biases, and cognitive limitations.

So, does this mean that CAPM is all that relevant anymore? Well, we can’t be sure but by marrying the precision of CAPM with the depth of behavioural insights, we edge closer to theories that reveal the true complexity of financial markets, offering a more accurate and human-centric lens through which to view the investing landscape.

References

Akerlof, G. A., & Shiller, R. J. (2009). *Animal spirits: How human psychology drives the economy, and why it matters for global capitalism*. Princeton University Press.

Baker, M., Bradley, B., & Wurgler, J. (2011). Benchmarks as limits to arbitrage: Understanding the low-volatility anomaly. *Financial Analysts Journal, 67*(1), 40-54. https://doi.org/10.2469/faj.v67.n1.4

Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of Financial Economics, 49*(3), 307-343. https://doi.org/10.1016/S0304-405X(98)00027-0

Engelmann, D., & Hollard, G. (2010). Reconsidering the effect of market experience on the "endowment effect." *Econometrica,* 78(6), 2005–2019.

Fama, E. F., & French, K. R. (2004). The capital asset pricing model: Theory and evidence. *Journal of Economic Perspectives, 18*(3), 25-46. https://doi.org/10.1257/0895330042162430

Fama, E. F. & French, K. R. (1992). "The Cross-Section of Expected Stock Returns". *Journal of Finance*. 47 (2): 427–465.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*(2), 263-291. https://doi.org/10.2307/1914185

Malkiel, B. G. (1973). *A random walk down Wall Street*. W. W. Norton & Company.

Shiller, R. J. (2000) Review of Irrational Exuberance. *The American Journal of Economics and Sociology*, 59(3), 537–540. http://www.jstor.org/stable/3487895

Shiller, R. J. (2015). *Irrational exuberance* (3rd ed.). Princeton University Press.

Shleifer, A. (2000). "Inefficient Markets: An Introduction to Behavioral Finance." Oxford University Press.

Team, C. (2024, February 13). Capital Asset Pricing Model (CAPM). *Corporate Finance Institute.* https://corporatefinanceinstitute.com/resources/valuation/what-is-capm-formula/

Thaler, R. H. (Ed.). (2005). Advances in Behavioral Finance, Volume II (STU-Student edition). *Princeton University Press*. http://www.jstor.org/stable/j.ctt1j1nwfj

Tversky, A., & Kahneman, D. (1974). "Judgment under Uncertainty: Heuristics and Biases." *Science*, 185(4157), 1124-1131.

Zhang, X., Bissoondoyal-Bheenick, E., & Zhong, A. (2023). Investor sentiment and stock market anomalies in Australia. *International Review of Economics & Finance*, 86, 284–303. https://doi.org/10.1016/j.iref.2023.03.024