

CREATING WEALTH IN A DEVELOPING ECONOMY BY INCORPORATING INVESTOR PSYCHOLOGY IN PORTFOLIO CONSTRUCTION

CH van Schalkwyk, Rand Afrikaans University

ABSTRACT

The need to take into account the impact of behavioural aspects of investing on asset allocation and portfolio construction, implementation and rebalancing is illustrated.

PURPOSE OF THE RESEARCH

Most questionnaires used by financial advisers to determine the risk aversion of individual investors include age, health, marital status, number of dependents, income, net worth and current investment portfolio. The investor's attitude towards risk and behaviour when faced with risk is, however, often ignored. The purpose of the research is to examine the impact of behavioural decision-making and investor psychology on an individual investor's risk profile, to determine if it should be considered when constructing and rebalancing investment portfolios.

RESEARCH METHOD

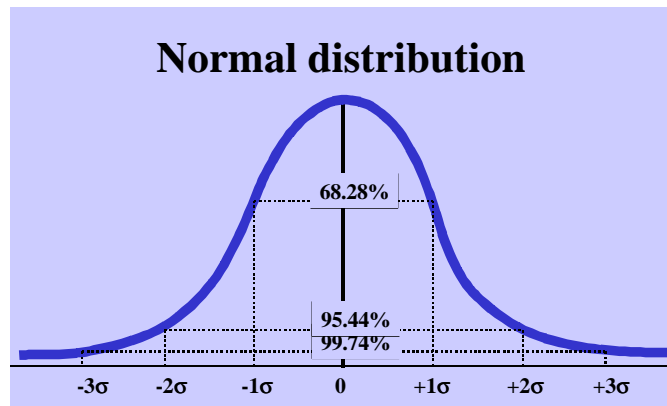
The research is based on a literature study of material relevant to behavioural decision-making and investor psychology. The research focused on investment, finance and economic publications and conference proceedings. Relevant information obtained from the World Wide Web was also included in the study. All the information was integrated and made applicable to the investment policies, risk perceptions and decision-making of individual investors.

CLIENTS PERCEPTION OF RISK

Clients perceive risk in different ways, and it is important, before categorizing a client, to determine his or her definition of risk. Kiefer (1999: 4) defines some of the most popular client perceptions of risk as the following:

Volatility – dispersion around the mean using for example standard deviation (Sortino, 1998: 4).

Figure 1: Standard deviation as indication of volatility or risk

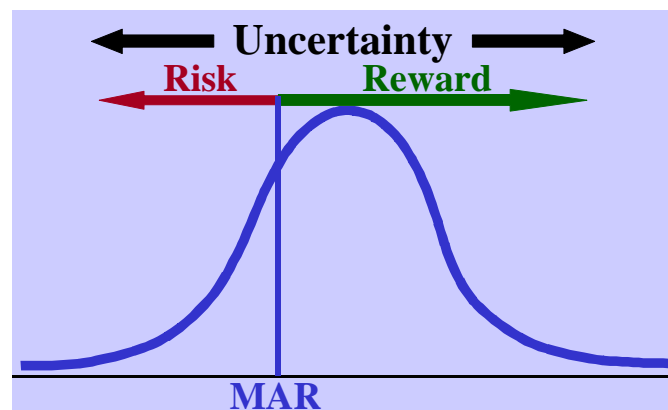


When risk is defined in terms of standard deviation (at 95% confidence level):

- 68.28% of returns fall within 1σ of the mean,
- 95.44% of returns fall within 2σ of the mean, and
- 99.74% of returns fall within 3σ of the mean, as indicated in figure 1.

The client might also look at standard deviation as depicted in figure 2.

Figure 2: A closer look at standard deviation



Returns lower than the minimal acceptable return (MAR) are perceived as risk, and returns higher than the MAR are perceived as reward.

Loss –many clients define risk as risk of losing capital or suffering a decrease in the value of a portfolio,

Regret – another risk perceived by the client is that of regret (Deanlebaron, 1999: 1):

- Selling an asset too soon - asset price keeps on increasing after a sale,
- Buying an asset too late – asset value falls after purchase,
- Increase in the value of assets previously owned.

Cash flow – Investors might need cash flow from investment (interest/dividends) to meet needs. Cash flow from investment might be lower because of company profitability affecting dividends, or decreasing interest levels affecting interest received from the investment.

Goal shortfall – Client might have short-term, medium term, or long-term goals:

- It could be an absolute goal, or relative to a particular benchmark.
- Even though returns might be positive, they do not meet the client's goal (Sortino, 1998: 7).

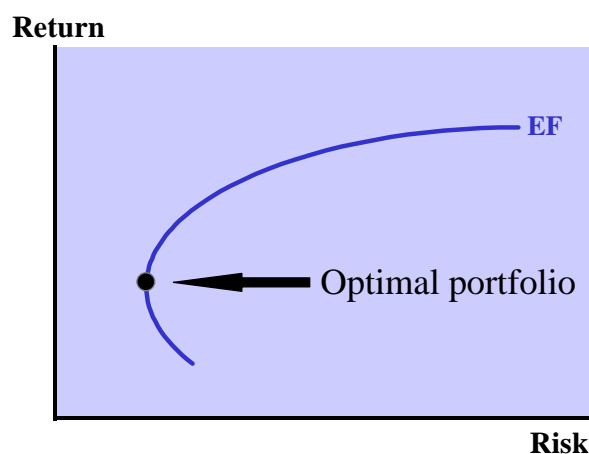
Performance risk – Clients buy assets based on past performance, and are then disappointed because the absolute performance is not as good as in the past.

CLASSICAL DECISION-MAKING

Tversky (1990: 73) proposes that classical decision making under risk incorporates three assumptions: asset integration, risk aversion, and rational expectation:

Asset integration: investors choose between risky prospects by comparing the distributions resulting from integrating these prospects with the rest of their assets. X is preferred to Y in asset portion W only if $W+X$ is preferred to $W+Y$.

**Figure 3: Classical decision-making -
asset integration, risk aversion, rational
expectation**



Risk aversion: if expected return is held constant, people prefer the prospect with the smaller spread of variance. People always prefer a sure outcome over a risky prospect with the same expected values.

Rational expectations: implies that people are coherent, accurate, and unbiased forecasters. Although people are not clairvoyant, their predictions are assumed to properly reflect all relevant information available to them – in the absence of insider information, all investors agree about the future value of a security.

The optimal portfolio, based on classical decision-making theory, would be the portfolio that minimises risk and lies on the efficient frontier as indicated in figure 3.

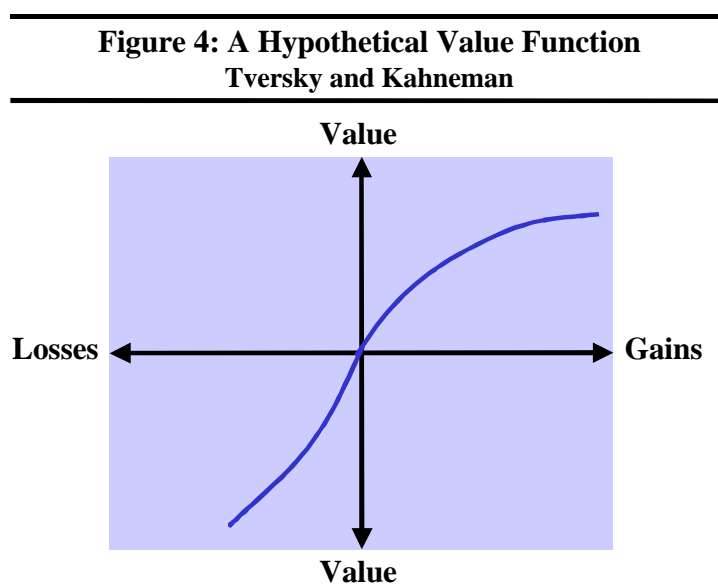
BEHAVIOURAL DECISION-MAKING

According to Kahneman and Riepe (1998: 1), to advise effectively, advisors must be guided by an accurate picture of the cognitive and emotional weaknesses of investors that relate to investment decisions. This is what Herbert Simon has called “bounded rationality” (Tversky, 1990: 73) Tversky (1990: 73) found that, in contrast to classical decision-making, people often exhibit risk seeking, that they tend to segregate outcomes of different decisions, and that expectations are often biased in predictable directions.

Prospect theory

Wood (1996: 76) indicates cause that one can put a spin on an outcome merely by framing the situation to create a sense of impending loss or gain, pain or pleasure. Deanlebaron (1999: 1) suggests that people become considerably more distressed at the prospect of losses than they are pleased by equivalent gains. In situations where the probability of loss is quite large, people exhibit risk-seeking rather than risk-averse behaviour (Tversky, 1990: 74).

Based on the above evidence, Tversky and Kahneman derived the hypothetical value function, depicted in figure 4, with three essential properties: (1) the function is not



Source: Tversky (1990: 74)

defined in terms of wealth, but in terms of differences in wealth – people are sensitive

to changes and relative insensitive to absolute values, (2) the value function is S-shaped: concave above the reference point and convex below it – people are risk averse in the domain of gains and risk seeking in the domain of losses, (3) the function is asymmetric: the loss curve is steeper than the gain curve – losses loom larger than gains (Tversky, 1990: 74). This tendency to make risk-averse choices in gains and risk-seeking choices in losses can cause people to choose suboptimal portfolios.

Regret and cognitive dissonance

Regret refers to people's emotional reaction at making a mistake. Investors avoid selling shares that have decreased in value, and sell shares that have increased in value quicker (Shiller, 1997: 6; Deanlebaron, 1999: 1). By doing so investors don't have to admit that they have made a mistake and feel regret, or to prevent feeling regret at hanging on to a share and seeing prices decline.

Cognitive dissonance is the pain of regret – the mental conflict that people experience when they realize that they have made a mistake. It was observed that money flows more rapidly into mutual funds that have performed extremely well than flows out from mutual funds that have performed extremely poorly: investors in losing funds are unwilling to confront the evidence that they made a bad investment by selling (Shiller, 1997: 6).

Anchoring/Reference dependence

Anchoring is a phenomenon in which investors assume current prices, earnings, or expectations are correct (Deanlebaron, 1999: 1). The market will sometimes under-react to a company suddenly reporting substantially higher earnings (Undiscovered Managers, 1999: 3). The share price does not rise because investors think the change is only temporary – they remain anchored to their previous view of the company's earnings.

Investors that invest substantial amounts in a share usually uses their purchase price as reference point (Kahneman, 1998: 12). Their reaction to changes in price is thus relative to the initial purchase price.

Mental compartments/accounts

People place their investments into arbitrarily separate mental compartments (Shiller, 1997: 8), and react separately and in different ways to the investment based on which compartment they are in. Tversky (1990: 76) notes that many families save for their children's university education, and then borrow money to buy a car even though the interest on the borrowed money is higher than the interest rate on their savings for their children's education.

Overconfidence

Peoples' beliefs and subjective probabilities are neither accurate nor unbiased – they make overconfident predictions (Tversky, 1990: 77). If analysts believe with eighty

percent confidence that a share is going to go up, they are right approximately forty percent of the time according to Wood (1996: 75).

Table 1: How Overconfidence Hurts Investors

Lost value from shares sold	-2.89%
Underperformance of shares bought	-0.68%
Transaction costs	-5.90%
<i>Total value lost</i>	<i>-9.47%</i>

Source: Odean (1997: 1)

A study of 10 000 discount brokerage accounts from 1987 to 1993 shows that on average, the stocks investors sold beat the market by 2.89% after two years and those they bought under performed it by 0.68%. Table 1 indicates how they lost out overall after two years.

Suitability

Financial advisers are required to ascertain that the securities they recommend are suitable for their clients, based on the clients financial conditions and needs (Statman, 1995: 20). For behavioural investors suitability regulations are important – they are tools that help them control the effects of their cognitive mistakes and self-control problems.

Greed and fear

Benjamin Graham, Warren Buffets mentor, said prices go through cycles, at some stage the market will price securities higher than their value and at other times the market will price securities lower than their value. His advice was to only buy securities if there was a margin of safety – securities priced lower than their value (Hagstrom, 1995: 34). Warren Buffet (Heller, 2000: 102) remarked in the 1986 Berkshire Hathaway Annual Report: “We only attempt to be fearful when others are greedy, and greedy only when others are fearful.”

DEFINING THE CLIENT

Barnewall two-way model

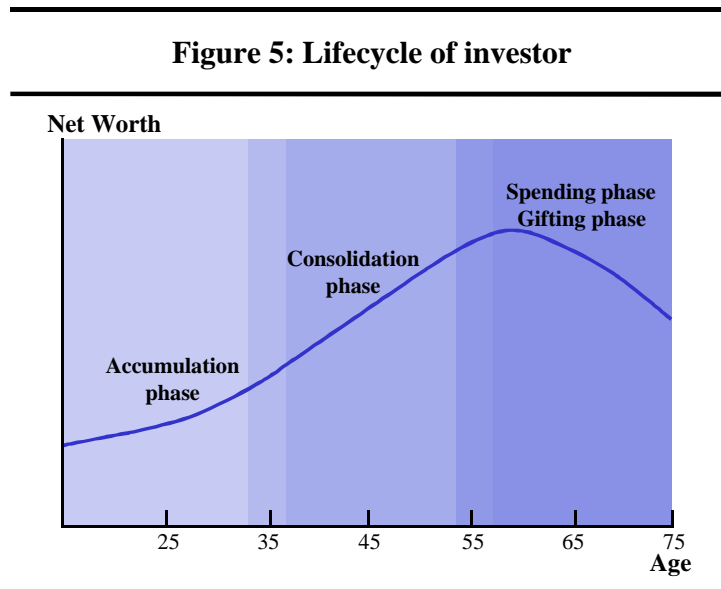
Marilyn Macgruder Barnewall developed a useful model of passive and active individual investors (Maginn & Tuttle, 1990: 3:6-7):

- Passive investors became wealthy passively, either by inheritance, or by risking others capital. They have a greater need for security than a tolerance for risk. Passive investors make the best clients – they tend to delegate and trust their advisor to do a good job. They are risk averse and require broadly diversified portfolios.
- Active investors earned their own wealth by being actively involved in their wealth creation or by risking their own capital. They have a higher tolerance for risk than a need for security. Active investors make more challenging clients –

they are personally involved and think they know more than their advisors do. Because of their willingness to take risk, they are more likely to prefer focused strategies.

Lifecycle of investor

Because the net worth and risk tolerance of investors change, their investment strategies will change over their lifetime as indicated in figure 5 (Reilly & Brown, 1997: 38-40).



- During the accumulation phase, investors' net worth is low and they have more immediate needs. Long-term goals would be to provide for retirement and their children's education, and short-term goals to pay for a house and car. They seek high risk, high return investments.
- Net worth is increasing during the consolidation phase and income exceeds expenses. Long-term goal would be to provide for retirement, while short-term goals include paying for children's education and vacations. Capital gains are balanced with some low risk assets.
- During the spending and gifting phases investors seek more protection as their earnings years have concluded. Long-term goals would be estate planning, and short-term goals include lifestyle needs and gifts. They seek low risk, low return investments.

INVESTMENT POLICY STATEMENT

According to Reilly & Brown (1997: 41), a policy statement need to be constructed for two important reasons: first, to help the investor decide on realistic investment goals, and second, to create a standard for evaluating the performance of the portfolio manager. Ellis (1985: 25-26) recommends that investors consider, amongst others, the following two questions as part of the process of constructing an investment policy statement: (1) What are the real risks of an adverse financial outcome,

especially in the short run?, and (2) What would my reaction to an adverse financial outcome be?

Investment Objectives

An investor's objectives are his or her investment goals, expressed in terms of both risk and return. Only looking at return as an objective is inappropriate, as excessive risk might have to be taken to achieve the return. Reilly & Brown (1997: 44) states that "A careful analysis of the client's risk tolerance should precede any discussion of return objectives".

Investment Constraints

Over and above the investment objectives, certain constraints also need to be taken into account when setting up an investment plan. Investment constraints include (Reilly & Brown, 1997: 46-51):

- (1) liquidity needs,
- (2) an investment time horizon,
- (3) tax factors,
- (4) legal and regulatory constraints,
- (5) and unique needs and preferences.

ASSET ALLOCATION

In a study done by Brinson, Hood & Beebower (1986), they found that 95 % of the returns on large pension funds in the United States could be attributed to asset allocation.

Figure 6: Steps in asset allocation

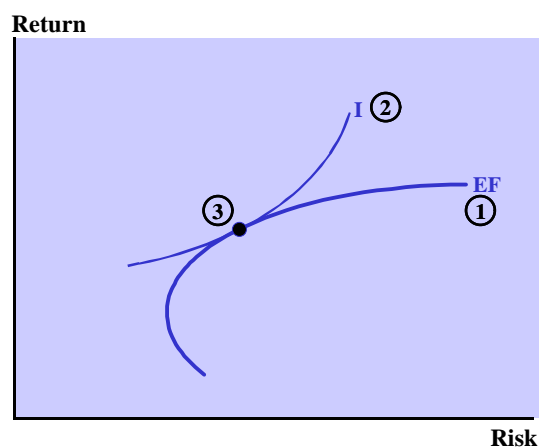


Figure 6 indicates the steps in asset allocation:

- ① Determine the risk/return attributes of available investments,
- ② Analyse the clients needs and constraints to determine risk aversion,
- ③ Compile optimal portfolio of client by making use of optimisation models.

PORTFOLIO REBALANCING

Even carefully crafted portfolios cannot suit a client's needs indefinitely. The investment manager or financial advisor must monitor changes and respond by rebalancing portfolios to accommodate them.

Reasons for rebalancing the portfolio

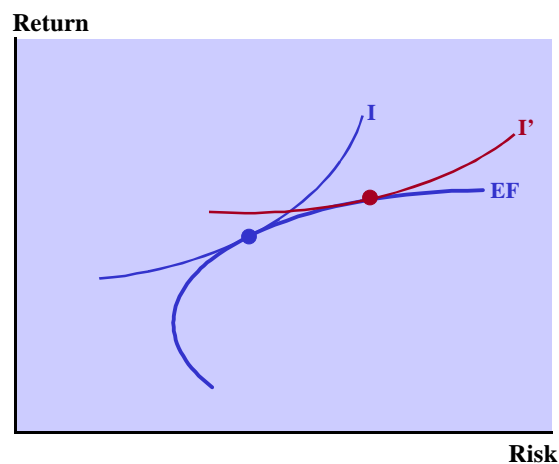
Portfolios need to be rebalanced under the following circumstances (Maginn & Tuttle, 1990: 13:4-8):

- Changes affecting the client – change in wealth, time horizons, liquidity requirements, tax circumstances, laws and regulations, and unique circumstances/preferences of the investor.
- New investment alternatives.
- Changes in asset risk attributes.
- Changing return prospects.

Portfolio rebalancing – client changes

A change in any one of the factors affecting the client will result in the risk aversion of the client changing. Figure 7 indicates what would happen if a client becomes more risk-seeking – he will move from indifference curve **I** to indifference curve **I'** on the same efficient frontier. The new optimal portfolio will deliver a higher return at a higher risk than before.

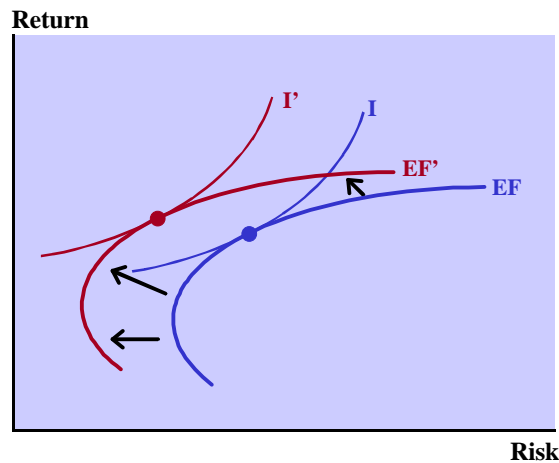
Figure 7: Portfolio rebalancing - client changes



Portfolio rebalancing – changes in risk/return

When there are changes in the risk/return attributes of investments, the investor will move from indifference curve **I** on efficient frontier **EF** to indifference curve **I'** on efficient frontier **EF'** as indicated in figure 8. Because of the change in risk/return attributes, the investor can now invest in a portfolio with a higher return to risk ratio.

Figure 8: Portfolio rebalancing - changes in risk/return



CONCLUSION

The findings of the research was that over and above the objectives and constraints of investors, behavioural aspects of investing play an integral role in an individual investors perception of risk. It found that individuals do not act in a rational manner when making investment decisions. Prospect theory, regret and cognitive dissonance, anchoring or reference dependence, mental compartments or accounts, overconfidence, suitability, and greed and fear all influence investor actions. The research found that investors become risk-seeking and avoid selling securities when faced with a loss, they place investments into separate mental accounts, and their decisions are adversely affected by greed and fear. These behavioural factors need to be incorporated as a risk factor when constructing and rebalancing investment portfolios of individual investors.

IMPLICATIONS

Financial advising is a prescriptive activity whose main objective should be to guide investors to make decisions that best serve their interests. To advise effectively, advisors must be guided by the cognitive and emotional weaknesses of investors that relate to making investment decisions. It is essential that financial advisors, in setting investment policies for individual investors, take into account their attitudes towards risk.

REFERENCES

Brinson, G.P., Hood, R. & Beebower, G.L. (1986). Determinants of Portfolio Performance. Financial Analysts Journal. July/August.

Deanlebaron. (1999). Investor Psychology. Retrieved October 6, 2000 from the World Wide Web:

<http://www.deanlebaron.com/book/ultimate/chapters/invpsy.html>

Ellis, C.D. (1985). Investment Policy: How to Win the Loser's Game. Homewood, IL: Dow Jones-Irwin.

Hagstrom, R.G. Jr. (1995). The Warren Buffet Way: Investment Strategies of the World's Greatest Investor. New York: John Wiley & Sons.

Heller, R. (2000). Warren Buffet: The Man who made Billions with a Unique Investment Strategy. London: Dorling Kindersley.

Kahneman, D & Riepe, M.W. (1998). Aspects of Investor Psychology. Journal of Portfolio Management, 24(4), n.p.

Kiefer, L.S. (1999). Building and Monitoring a Client's Risk Profile. (2000). Conference proceedings of the Investment Counseling for Private Clients II conference. Conducted by AIMR. Charlottesville, VA: Association for Investment Management and Research.

Maginn, J.L. & Tuttle, D.L. (1990). Managing Investment Portfolios: A Dynamic Process. 2nd ed. Boston: Warren, Gorham & Lamont.

Odean, T. (1997). How Overconfidence Hurts Investors. Retrieved September 29, 2000 from the World Wide Web:

<http://www.businessweek.com/1997/39/b3546142.htm>

Reilly, F.K. & Brown, K.C. (1997). Investment Analysis and Portfolio Management. Fort Worth: Dryden.

Shiller, R.J. (1997). Human Behavior and the Efficiency of the Financial System. Conference proceedings of the Recent Developments in Macroeconomics conference held in New York. Conducted by the Federal Reserve Bank of New York. New York: Federal Reserve Bank.

Sortino. (1998). The Best Quantitative Techniques for Asset Management... Retrieved September 27, 2000 from the World Wide Web:

<http://www.sortino.com/htm/mobiusconf2.htm>

Statman, M. (1995). Behavioral Finance versus Standard Finance.

Conference proceedings of the Behavioral Finance and Decision Theory in Investment Management conference. Conducted by AIMR. Charlottesville, VA: Association for Investment Management and Research.

Tversky, A. (1990). The Psychology of Risk. Conference proceedings of the Quantifying the Market Risk Premium Phenomenon for Investment Decision Making conference. Conducted by AIMR. Charlottesville, VA: Association for Investment Management and Research.

Undiscovered Managers. (1999). Introduction to Behavioral Finance. Retrieved October 6, 2000 from the World Wide Web:
<http://www.undiscoveredmanagers.com>

Wood, A.S. (1996). Behavioral Risk: Anecdotes and Disturbing Evidence. Investing Worldwide VI, AIMR.