

## **CHAPTER 2**

### **THE PSYCHOLOGY OF PERSONAL INVESTMENT DECISIONS**

The objective of this chapter is to provide an understanding of:

1. The purposes and constraints of personal financial decisions.
2. The characteristics of various investments, including their risks.
3. The management of risk.
4. The psychology of personal financial decisions.
5. Differences in attitudes to saving.

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#### **Choice under Constraint**

When making personal investment decisions investors seek to achieve objectives whilst taking account of their circumstances (which might be regarded as the constraints that they face). Objectives would include obtaining a high rate of return on their investments and the avoidance of substantial risk.

Another objective might be the maintenance of adequate liquidity. Another could be the receipt of a high and stable income without resort to selling or cashing in investments.

Relevant circumstances (constraints) are many and varied. Table 2.1 lists some relevant circumstances.

Age (stage in the life cycle)

Investment horizon

Size of existing assets

Diversity of existing assets

Liabilities

Net worth

Current income

Stability of income

Earning potential

Family responsibilities

Tax bracket  
 Expected legacies  
 Intended legacies

**Table 2.1**

This chapter will consider these objectives and circumstances in turn. First, however, the impact of various personal characteristics and circumstances will be illustrated by Table 2.2 in which a '+' indicates a favourable disposition towards a particular characteristic of an investment and a '-' indicates an aversion to a feature of an investment instrument.

	Growth potential	Income yield	Capital risk	Income risk	Liquidity
High capital risk aversion			-		+
High income risk aversion		+		-	
Advanced age			-		+
Young age	+				
Long investment horizon	+				
Short investment horizon	+		-		+
Large existing assets	+				
Low existing assets	+		-		+
High diversity of existing assets	+				
Low diversity of existing assets	+		+		+
Large liabilities	+	+	-	-	+
Low liabilities	+				
High net worth	+				
Low net worth	+		-		+
High current income	+				

Low current income	+	+	-	-	+
Stable income	+				
Unstable income	+	+	-	-	+
High earning potential	+				
Low earning potential	+	+	-	-	+
High family responsibilities	+	+	-	-	+
Low family responsibilities	+				
Large expected legacies	+				
Low expected legacies	+		-		
Large intended legacies	+		-		
Low intended legacies	+				
High income tax bracket	+	-			
Low income tax bracket	+	+			

**Table 2.2**

### **Objectives**

The objective of a high rate of return is based on the view that it is better to have more money rather than less. A high rate of return means that, when the investment is eventually sold or cashed in, the sum of money received by the investor is relatively large. Return comprises both income yield and capital gains.

The objective of liquidity relates to the speed and cost of turning an investment into cash. A liquid asset is one that can be transformed into cash quickly and at little cost. An illiquid asset is one that cannot be converted into cash quickly and which may require the investor to accept a low price in order to find a buyer for the asset.

Many investors depend on their investments to provide income. Although income could be obtained by selling investments (maybe to cash in capital gains), there may be reasons for not doing so. One reason may be the avoidance of the possibility that selling investments could jeopardise future income receipts. 'Never touch the capital' is a rule of thumb that aims to preserve the source of future income. Another reason might be that an investment is indivisible, for example the ownership of a house for the purpose of obtaining rental income – it is not possible to part sell the house to augment rental income.

### **Types of Risk**

Low risk is probably the most complex and multi-faceted of the objectives. This is largely because risk has many dimensions. It has been suggested that there are more than twenty forms of risk that an investor may face. Some of the more important risks will be mentioned here.

Market risk is the risk that the value of an asset falls because of a generalised decline in asset prices. For example the price of a share may fall as part of a general decline in the stock market. Market risk is a form of capital risk. Capital risk is the risk of a reduction in the value of an investment. Market risk is alternatively known as systematic, or non-diversifiable, risk.

Non-systematic risk is the risk that the value of an investment may fall as a result of factors specific to that investment. For example the price of a company's shares may fall because a competitor begins to offer a superior product. Non-systematic risk is alternatively known as specific, or diversifiable, risk. It is called diversifiable risk because a well diversified portfolio of shares should eliminate such risk (strong performances tending to offset weak ones).

An increase in interest rates tends to be accompanied by declines in asset prices. This relationship is particularly reliable in the case of long-dated bonds. A bond is an investment that typically pays the investor a constant sum (the interest or coupon) each year and then repays the original investment on a maturity date. If interest rates on other investments rise, bonds become relatively less attractive and their prices fall. The impact of interest rate changes increases with the maturity (strictly speaking the duration) of a bond. This is a form of capital risk, which is the risk that the value of an investment may fall.

Interest rate changes are also associated with income risk. Income risk is the risk that the income receipts from an investment will fall. A long-dated bond has little income risk since the coupon receipts are known with certainty until the maturity date of the bond. On the other hand a bank or building society deposit has high income risk. As short-term interest rates fluctuate so will the interest payments to investors.

A source of both capital and income risk on bonds is default risk. This is the risk that the issuer of the bond fails to make coupon (interest) payments, or fails to repay the principal amount on the maturity date of the bond.

A related risk is credit risk. Bonds are given credit ratings by credit rating agencies. The ratings are intended to indicate the likelihood of default. If the credit rating of an issuer, or bond, is reduced the market price of the bond will fall.

A form of both capital and income risk is inflation risk. This is the risk that general price inflation erodes the purchasing power value of an investment and the income derived from that investment. This is alternatively known as purchasing power risk.

Currency, or exchange rate, risk relates to investments denominated in foreign currencies. If the currency in which the foreign investment is priced falls relative to the investor's own currency, the value of the investment and income from it will fall in terms of the investor's own currency.

Political risk is the risk that governmental decisions will adversely impact on the value of investments or the income from them. Since the income relevant to investors is after-tax income, changes in tax rates are a form of political risk.

World-event risk is the risk of events impacting negatively on investments. The terrorist attacks of 11<sup>th</sup> September 2001 provide an example of such risk.

Liquidity risk is the risk that it becomes difficult to liquidate an investment. If buyers for a particular investment become scarce it may become difficult to sell, at least without having to substantially lower the selling price.

So risk is varied in nature. The objective of achieving low risk may need to address a large number of different risks.

### **Constraints**

Some constraints arise from the attitudes of the investor. It is sometimes said that investors are motivated by greed and fear. Greed relates to the desired rate of return and fear is concerned with the level of risk. An investor who seeks a high rate of return and who is tolerant of risk will tend to choose investments that offer high potential returns albeit at the cost of high risk. Conversely an investor, who is content with a modest rate of return whilst being intolerant of risk (i.e. highly risk averse), would choose investments that offer limited returns and relative certainty.

A factor that should affect risk tolerance/aversion is the age of an investor. Someone saving in order to fund a retirement pension but with 40 years to retirement is in a position to accept risk. There is scope for periods of good investment performance to compensate for poor periods, furthermore there is time for the investor to retrieve investment failures by increasing the rate of saving in the future. Someone with just 2 or 3 years to retirement does not have these advantages of a long investment horizon and needs to be more conservative in terms of investment strategy.

A number of individual circumstances inter-relate. The factor of age is linked with the issues of investment horizon and stage in the life cycle. The investment horizon is the period to the moment at which investments will be liquidated to finance expenditure (for example expenditure on an annuity to provide a retirement income). Short investment horizons allow little scope for accepting risk.

Retirement is not the only source of an investment horizon during a person's lifetime. The life cycle can produce other horizons such as the purchase of a house, for which a deposit may need to be saved, or the finance of children's education.

The amount, and nature, of existing assets should also influence investment decisions. An investor whose wealth is already substantial will be better able to tolerate risk than someone who has little existing wealth. The nature of the existing wealth also has significance. Someone who already has a large sum in a safe and liquid form is in a strong position to put new savings into relatively risky and illiquid investments. The value of existing wealth, relative to needs, will also have implications for the amount of saving that someone should aim for. If assets are already considerable, little further saving and investment may be necessary.

The nature of existing wealth has implications for new investment since investors should bear in mind the desirability of diversification. If one's existing wealth is primarily in residential property then one should consider investing new wealth in assets such as bonds and shares. Someone whose existing wealth is primarily in residential property should be aware that investing in more property, perhaps in pursuit of rental income, provides high exposure to any downturn in property prices. An investor should also give thought to whether new investments should be influenced by his/her income from employment. Employment income may already provide exposure to the fortunes of a business, investing in shares or bonds issued by that business would increase exposure to the risk of that firm performing badly. More broadly, someone employed in a cyclical industry might be well advised to invest outside that industry in order to avoid compounding the losses from a downturn in that industry.

It is not only the amount and nature of existing assets that should be considered when allocating savings. Liabilities should also be considered. Someone with large debts relative to wealth and income may not be in a strong position to accept risk. In fact the first priority for any surplus funds is often reduction of debt. This is particularly so if the interest payable on the debt is high relative to potential returns on investments.

Income should also influence investment decisions. It is not only the size of current income but also potential future income, and the prospective stability of income, that has implications for investment behaviour. Someone with low prospective income may use any investments as a means of augmenting income. Such an investor should be income risk averse. There should be little tolerance for the risk of a falling investment income. The investor should therefore avoid investments that have income risk. This

entails avoidance of investments such as bank or building society deposits since the interest from such investments is subject to considerable variation. The investor should prefer investment in long-term bonds and in shares with high and stable dividend payments. Similar considerations apply to people whose employment income is prospectively unstable since they might look to investments as a source of stable income.

If someone can confidently anticipate a rising future employment income that person could not only reduce current saving but could also be willing to accept a relatively high risk on current investments. High future income would allow the investor to compensate for current low saving by increased future saving, and would give scope to replenish investments in the event of any losses incurred as a result of accepting high risk.

Family responsibilities also impinge on financial decision-making. An unattached person is probably in a better position to take risks than someone with dependents. Legacies are also significant. Someone who is confident of inheriting a substantial sum of money before retirement has less need to save, and can take more risks with investment choices. Someone wishing to bequeath money has a greater need to save from current income.

Taxation can impact on investment decisions. For example people often have different tax rates for income and for capital gains. Someone in a high income tax bracket but subject to low capital gains tax would tend to prefer investments whose returns are in the form of capital gains rather than interest or dividend payments. Such an investor might be inclined to a growth orientated unit trust rather than a building society account or bond fund.

It appears to be the case that interest rates contain a component to compensate for expected inflation. For example if inflation of 2.5% p.a. is expected and a bank account offers 3.5% p.a., the real interest rate is expected to be 1% p.a. because 2.5% of the interest simply compensates for the erosion of the value of money due to rising prices. However income tax is applied to the whole of the interest, not just the real interest. At an income tax rate of 40% the 3.5% p.a. is reduced to 2.1% p.a. A pre-tax positive real interest rate becomes a post-tax negative real interest rate (minus 0.4% p.a.). The procedure of

taxing the whole of an interest return rather than just the real interest can cause investments to provide negative after-tax real returns. People with high income tax rates but low capital gains tax rates might prefer investments that provide returns in the form of capital gains, such as unit trusts that invest in shares, rather than investments that provide returns in the form of interest, such as bonds and building society accounts.

Some constraints are self-imposed. For example many people take an ethical view when investing. This may cause them to look for investment funds that adopt an ethical dimension. Such funds may avoid investments in firms involved in tobacco, alcohol, gambling or armaments. Human rights and environmental records are also likely to be considered by funds that have an ethical dimension.

Many people may feel that they lack the expertise to make informed investment choices. An analogy could be drawn with medical treatment. Many people would prefer that a doctor decide on their appropriate treatment on the grounds that the doctor has much greater understanding of the medical condition, and its treatments, than they do. Although increased choice is usually seen as a good thing, it may not be if people lack the expertise to exercise the choice.

### **Characteristics of Investments**

It is worthwhile considering the characteristics of some forms of investment popular amongst individuals. The most popular is probably the bank or building society deposit. On the upside these are free of capital risk, offer an income yield, and are usually liquid. On the downside they lack substantial growth potential, are subject to a high level of income risk and have inflation risk.

Rental, or buy-to-let, property has become popular in recent years. Such investment has growth potential and provides an income yield. On the downside it is illiquid and subject to both income and capital risk. The income risk relates to the possibility that rents fall, or that a property fails to attract tenants and remains unoccupied for long periods. The capital risk exists because property prices can fall.

A third investment alternative is provided by equity unit trusts, which invest in a broad portfolio of shares. These provide growth potential and are liquid. On the downside they are prone to both capital and income risk. The income risk is such that no income yield may be forthcoming during some periods.

A related investment possibility is provided by high-income equity unit trusts. These differ from other equity unit trusts in persistently providing an income yield, and probably with less income risk.

A higher current level of income is normally available from bond unit trusts. These are liquid with relatively low levels of income and capital risk. However they do not usually offer much growth potential and are vulnerable to inflation risk.

### **Human Capital**

One source of wealth that is often overlooked when considering personal finance is human capital. Human capital is the present value of future employment earnings. It is enhanced by investment in education and training.

An individual's wealth can be classified into four categories: an investment portfolio (including residential property as well as financial assets), the present value of future state and occupational pension receipts, the present value of expected legacies, and human capital. Especially for young people, human capital may be the largest element in total wealth. These four sources of wealth are employed to meet the individual's objectives. The objective may merely be to maximise lifetime consumption of goods and services, but there may be other objectives.

The preparation for retirement involves converting human capital into financial wealth. Proximity to retirement also influences the choice of the type of financial wealth. Bonds provide a constant stream of income with relatively little risk that the bond price will fall substantially or that the income will not be received. It is usually recommended that as retirement approaches the proportion of financial wealth held in the form of bonds should increase. There are three reasons for this.

First, a short period to retirement gives little opportunity to recover from the effects of a stock market crash. Switching towards bonds provides some immunity against a crash. Someone who has a long period to retirement can compensate for investment losses by saving more (possibly with the aid of working more) during the remaining period to retirement. Someone close to retirement does not have this facility to the same extent. (The facility of choosing to save more could be seen as an option that hedges, i.e. provides protection, against investment losses).

Secondly, short of a stock market crash there is a risk of some decline in share prices. The value of equity (share) investments tends to increase more than proportionately to the passage of time (due to compound returns) whereas the risk (measured by the dispersion of possible values) increases less than proportionately to the passage of time. This renders shares more suitable as long-term investments and less suitable as a preparation for imminent retirement.

A third reason for switching towards bonds over time relates to the nature of human capital. For most people human capital behaves like bonds in that it provides a fairly constant and regular stream of income. Human capital declines as the remaining working life declines. The passage of time reduces a bond-like form of capital (human capital) and it appears to be appropriate to replace it with bonds on the grounds that they have similar characteristics.

Van Eaton and Conover (2002) drew the implication that, since human capital is relatively low risk, investors whose assets are predominantly in the form of human capital should hold 100% of their financial assets in the relatively high-risk form of shares. Later in life as human capital has declined, and equity (share) holdings have increased, the risk level of the total portfolio will be higher. At that stage some switching from shares to bonds would be appropriate in order to keep portfolio risk within acceptable limits. This reasoning justifies the common advice that investors, as they grow older, should switch from equities to bonds.

Human capital is subject to mortality risk since death eliminates human capital. From the perspective of the family, the death of an income earner is a financial loss as well as a personal loss. Human capital can be insured by the purchase of life assurance. In the event of death the loss of human capital is

offset by the receipt of an insurance payment. Life assurance is not the only way of obtaining protection against the death of an income-earner. The chapter on portfolio diversification develops the theme of holding a diversified portfolio of assets as a means of obtaining protection from the consequences of the loss of one asset. A portfolio of other assets (shares, bonds, mutual funds, investment properties, etc) provides a source of income for the family in the event of the death of an income-earner. Portfolio construction and life assurance are alternative means of managing the mortality risk of human capital. Conventionally decisions relating to investment portfolios and life assurance are taken separately but Chen, Ibbotson, Milevsky and Zhu (2006) argue that portfolio decisions and life assurance decisions should be taken jointly since they are alternative means of managing the mortality risk of human capital.

### **Risk Management**

All financial decisions are influenced by the risks faced and the approach taken to management of those risks. Individuals and households face a number of risks and effective decision-making requires that those risks be recognised.

Risk may be regarded as uncertainty that matters (an alternative definition of risk is uncertainty that can be measured). Our experience provides us with a vast number of uncertainties, but many of them do not matter to us. The result of a football match is uncertain but if it is of no interest to a person then it is not a risk for that person. House prices are uncertain and to a potential house buyer that uncertainty is important, it is therefore a source of risk.

Risks facing individuals and households can be divided into six types.

1. Sickness, disability, and death.
2. Unemployment.
3. Housing. Property is vulnerable to events such as fire and a decline in market value.
4. Consumer durable risk. For example cars are vulnerable to theft or accidental damage.
5. Liability risk. This is the risk that others may have a financial claim against you because they suffer a loss for which you could be held responsible, e.g. causing injury in a road accident or being sued for negligence.

6. Financial asset risk. The risk that the value of investments, or the income from them, may fall.

Many decisions, not just those that are specifically risk management decisions, will be influenced by these risks. However a person may fail to identify some of the risks and hence fail to take account of them. Approaches to decisions that specifically relate to risk management may be divided into four categories.

1. Risk avoidance. For example one way to manage stock market risk is to refrain from investment in the stock market.
2. Risk reduction. This is concerned with reducing the likelihood or severity of losses. For example if stock market investment is through a well diversified portfolio (perhaps by means of a unit trust) the risk is reduced relative to an investment in a small number of stocks.
3. Risk retention. This is a decision to accept risk and bear any losses that may arise.
4. Risk transfer. This entails passing the risk to another person or organisation. For example a property owner may insure against fire. At the cost of the insurance premium, the risk of loss through fire is transferred to the insurance company.

In relation to investment (financial asset) risk, investors could see risk in relation to three possible benchmarks. One benchmark is zero; an investor may primarily be concerned with the possibility of a return below zero, a loss in absolute terms. Another possible benchmark relates to an alternative investment, for example performance relative to a stock index such as the FTSE 100; underperformance may be regarded as an opportunity loss. A third benchmark could be a predetermined personal goal; underperformance indicates that personal financial planning is not proceeding in line with expectations.

Risk means different things to different people. Investment decisions are often taken in consultation with a financial adviser. However what the adviser understands by risk may differ from what the client understands by risk. Diacon (2004) found that advisers were less fearful of losses (less loss-averse) than investors, and less likely to see financial services products as complicated. He also found that advisers were more willing to trust the providers of financial products and to trust regulators.

Experts tend to think of risk as objective and measurable, and to have a narrow definition of risk.

Individual investors are more likely to have a subjective and multi-dimensional view of risk.

MacGregor, Slovic, Berry and Evensky (1999), based on a survey of financial advisers, suggested that the narrow and objective measure of risk was present in the tests for risk-aversion administered to clients rather than in the minds of the advisers. Their finding was that advisers saw risk as multi-dimensional, as did their clients. They expressed the view that representing risk-aversion as a uni-dimensional index may make communication between advisers and clients more difficult.

The risk perceptions of individual investors may be widely shared as a result of social interaction. Non-experts may demand certainty of expectations, which experts know cannot be provided. Uncertainty of expectation could be frustrating for the clients of advisers. The differing perceptions of risk, between adviser and client, could be responsible for some of the mis-selling claims in the UK during the 1990s and 2000s. The adviser may not fully communicate the potential range of variability of investment outcomes, possibly because of a failure to understand the extent of a client's misunderstanding of risk. Diacon suggested that it might be useful to include consideration of risk perception and behavioural finance in the training of financial advisers (behavioural finance is the application of psychology to the understanding of financial decision-making).

Among non-experts risk is perceived as greater if the person lacks information about, or control over, outcomes. Lack of information and control in regard to investment outcomes leads to mistrust of providers of financial services and mistrust of financial advisers (Sjoberg, 2001). The mistrust of financial advisers may be based on a perceived affiliation bias whereby advisers are seen as being too trusting of the providers of financial services. Also experts tend to think in terms of an average consumer, whereas individuals are concerned specifically with their own case.

Filbeck, Hatfield and Horvath (2005) examined the relationship between personality type and attitude to risk. Personality types were classified according to the Myers-Briggs Type Indicator, which uses four dimensions.

1. Extroversion versus introversion. Extroverts focus their attention on other people whereas introverts are inwardly focused.

2. Sensing versus intuition. Sensing people tend to focus on facts whereas the intuition group are more concerned with abstract ideas.
3. Thinking versus feeling. The thinking group attempt to be objective and logical in their decision-making. Feeling people are subjective decision-makers.
4. Judging versus perceiving. Judging individuals lead organised, and orderly, lives. Perceiving people lead flexible and spontaneous lives.

They found that extroversion versus introversion had no bearing on attitude to risk. Sensing individuals were more tolerant of risk than the intuition people. Thinking people were more tolerant of risk than feeling people. Individuals with a preference for judging were able to tolerate more risk than those with a preference for perceiving.

The management of risk is based on an investor's attitude to risk. An investor who is tolerant of risk would accept levels of risk that would be deemed unacceptable by someone with a strong aversion to risk. Attitudes towards risk vary considerably between people. Grable, Lytton and O'Neill (2004) found that men were more tolerant of risk than women. They also found that people with high incomes were more willing to accept risk than those on low incomes. Hallahan, Faff and McKenzie (2004) found that risk tolerance is greater for men, young people, well-educated people, those on higher incomes, those with higher wealth, and single people.

It is common for financial advisers to measure attitude towards risk, typically using a set of questions, before providing advice to a client. However another factor identified by Grable, Lytton and O'Neill throws the usefulness of such risk measures into doubt. They found that recent stock market performance influenced attitudes to risk; a finding confirmed by Yao, Hanna and Lindamood (2004). A recent rise in share prices makes people more tolerant of risk whereas a recent fall causes them to be more averse to risk. The consequence is that attitudes to risk change over time and that measurement of attitude to risk at a single point in time may produce an unrepresentative result.

Exhibit 2.1 indicates possible differences between financial advisers and their clients in relation to the perception of risk. This draws on psychological factors discussed in this chapter, and in the chapter on noise trading and behavioural finance. Differences in the perception of risk can cause communication

failures between advisers and their clients. Advisers may give what they see as good advice, when the advice is viewed in the light of their own perceptions. The clients interpret what they hear in the light of their perceptions, and their interpretations could differ from those of the advisers. In consequence clients may feel that they were misled (mis-sold), whilst the advisers believe that their advice was good.

According to MacGregor, Slovic, Berry and Evensky (1999, p. 84): “More than two decades of research on the psychology of risk perception in domains other than finance have revealed that the prospects for effective risk communication between professionals and non-professionals are exceedingly dim when they do not share a common definition of risk.”

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**EXHIBIT 2.1**

Mis-selling or miscommunication? Apparent mis-selling of financial products may be the result of different perceptions between advisers and clients.

<b><u>ADVISER</u></b>	<b><u>CLIENT</u></b>
Symmetrical view of risk	Prone to loss aversion
Objective probability	Decision weighting
Risk is objective	Risk is subjective
Objective	Frame dependent
Objective benchmarks (e.g. stock index)	Personal benchmarks
Objective	Availability bias
Objective	Home bias
Objective view of investments	Attachment bias/ego-involvement
Flexible	Endowment effect
Flexible	Prone to anchoring
Objective	Disposition effect
Objective	Decisions influenced by emotion and mood
Detached	Influenced by social mood
Detached	Susceptible to rumours

Accepting of uncertainty	Unable to accept randomness
Accepting of uncertainty	Illusion of control
Accepting of uncertainty	Prone to representativeness
Rational	Superstitious (conjunction fallacy)
Realistic	Outcome biased
Realistic	Overconfident
Objective expectations	Hindsight biased expectations
Focus on appropriate horizon (e.g. 20 years)	Focus on inappropriate horizon (e.g. 1 month)
Focus on relevant risk (e.g. income risk)	Focus on irrelevant risk (e.g. capital risk)
Financial products understood (familiar)	Financial products complicated (unfamiliar)
Financial products understood (familiar)	Information overload
Future orientated/ Decisive	Hyperbolic discounting/ Procrastination
Concerned with typical client	Heterogeneous
Assumes constant risk aversion	Risk aversion variable
Focus on whole portfolio	Mental accounting/ goals based
Focus on whole portfolio	Choice bracketing
Focus on whole portfolio	Focus on individual investments

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Diacon and Ennew (2001) identified five dimensions of risk that were of particular importance to retail investors: distrust of the product and/or provider and/or adviser; the seriousness of adverse consequences; volatility of return/value; poor knowledge and/or poor transparency; and regulatory failure.

An exchange between contracting parties, such as that between client and financial adviser, requires trust. Clients must be confident that advisers will not exploit the relative ignorance of the clients (the asymmetric information). Trust requires that the client has confidence in the competence and benevolence of the adviser. Risk perception is magnified when clients feel that they cannot trust advisers and providers. Clients find many products difficult to understand, and are therefore dependent upon the advice of an expert. Clients will perceive high levels of risk if advisers or providers are not trusted.

The seriousness of adverse consequences relates to the loss aversion identified by prospect theory, wherein the pain of loss exceeds the pleasure of gain. According to prospect theory people are concerned with gains and losses more than with levels of wealth, and there is a particular fear of loss. This is known as loss-aversion. Diacon and Ennew found that loss-aversion was present alongside risk-aversion, which is the dislike of volatility (i.e. price variations) irrespective of direction.

Poor knowledge and understanding was a risk factor that affected a number of financial services products such as personal pensions, endowment policies, and investment bonds. These products often lack transparency with the effect that the consumer may be unclear about the nature, operation and performance of the product.

### **The Psychology of Personal Finance**

Many retail investments are stock market related. These include pension funds, ISAs, unit trusts, and investment bonds. It is desirable that decisions relating to stock market related investments should be made rationally.

Psychological research has indicated that there are biases in decision-making. These biases have implications for the decisions as to whether to invest in stock market related products, the extent of such investment, and the nature of the investments. The biases could cause investors to make poor decisions; or financial advisers to give poor advice. If investors understand the psychological biases to which they may be prone, they may be able to compensate for them when making investment decisions. If a financial adviser knows the psychological biases that affect clients, the adviser can try to offset those biases by appropriate information and advice. Whilst a financial adviser should discover and accept a client's preferences, the adviser should attempt to dispel misperceptions and misjudgements that arise from the client's psychological biases. Simultaneously advisers should guard against the biases to which they themselves may be prone.

Psychological research has found a number of systematic biases that affect investors. These include Overconfidence, Hindsight Bias, Representativeness, Conservatism, Narrow Framing, Retrievability,

and Ambiguity Aversion. In addition social influences and moods (emotions) affect investment decisions. All of these biases interfere with the process of rational decision making. Psychological factors can be divided into self-deception, heuristic simplification, social influence, and emotions (Hirshleifer 2001). Some psychological influences may belong to more than one of these categories.

### **Self-deception**

Self-deception is the process whereby people exaggerate their abilities. People tend to think that they are better than they really are. One psychological bias is overconfidence. Overconfidence arises partly from self-attribution bias. This is a tendency on the part of investors to regard successes as arising from their expertise whilst failures are due to bad luck or the actions of others. This leads to excessive confidence in one's own powers of forecasting. It is capable of explaining a number of types of apparently irrational behaviour. For example it can explain why some investors hold poorly diversified portfolios. If investors are highly confident about their selection abilities, they will not feel the need to reduce risk by means of diversification. It could also explain why some investors trade very frequently, to the point where transaction costs cause their investment behaviour to be loss making.

Overconfidence can explain why some investors churn their portfolios; that is persistently sell and buy. A confident belief in one's ability to forecast price movements increases the likelihood of frequently buying expected winners and selling expected losers. This behaviour entails a new set of transaction costs (initial charges) each time with the effect that the investors lose. This churning may be recommended by overconfident financial advisers (who incidentally receive a new set of commission payments each time the churning occurs). Overconfidence is likely to affect investment professionals as well as private individuals. Slovic, Fischhoff and Lichtenstein (1980) pointed out the overconfident behaviour of professionals, including overconfidence in their theories. In particular when experts use intuitive judgment, rather than statistical data, they are prone to the same biases and errors as non-experts. Overconfidence may help to explain why stock market turnover is high even when there is little new information, or new liquidity, coming into the market.

Odean (1998a) has shown that one of the effects of overconfidence is that turnover of investments tends to be high, that is people trade shares more as a result of overconfidence. Statman, Thorley and Vorkink (2006) found that trading volumes rose when stock prices had recently risen, which was seen

as consistent with the overconfidence bias; overconfident investors trade more frequently following market gains since they mistakenly attribute their gains to their investment skills. Barber and Odean (2000) have shown that as turnover rises net profits tend to fall. Psychological research has found that men tend to be more overconfident than women. Barber and Odean (2001a) found that single men trade 67% more than single women. Correspondingly single men on average experienced investment returns 3.5% per year lower than single women. Friesen and Sapp (2008) found that investors who actively traded mutual funds (frequently selling unit trusts and buying others) had lower average investment returns than those who simply followed a buy-and-hold strategy (did not change subsequent to purchase). It was found that actively trading investors who chose the funds, which had been the best past performers, experienced the lowest returns.

The findings of Barber and Odean raise the issue of gender differences in overconfidence. Olsen and Cox (2001) found that both men and women professional investors tended to believe that women are less confident than men, even when they have similar expertise and experience. They also found that women financial professionals tended to be more risk-averse than their male counterparts, with a greater tendency to reduce risk and a greater inclination to perceive investments as risky. Bernasek and Shwiff (2001), in an examination of the choices of members of pension schemes, found that women tended to be more conservative than men in that they chose lower proportions of equities (i.e. shares were a lower fraction of their pension funds). In other words, women chose lower risk funds. Dwyer, Gilkeson and List (2002) examined gender differences amongst retail investors when choosing between mutual funds (unit trusts and OEICs). They found that women were more inclined to choose low risk funds. Their analysis suggested that this was largely because the women in their survey, on average, had less knowledge of investments than men.

The hindsight bias is similar to the overconfidence bias except that it relates to evaluations of the past rather than the future. Fischhoff (1982) explains that with the Hindsight Bias people consistently exaggerate what could have been anticipated. People tend to view what has happened as having been inevitable, and see it as having been predictable before it happened. People even misremember their own predictions; memory is fallible. Azar (2000) suggested that, if people cannot remember their

original judgement, they would reconstruct the recollection of the original judgement in the light of subsequent information.

'I knew that would happen' and 'I knew it all along' are statements that characterise the hindsight bias. The hindsight bias is the inability to correctly remember one's prior expectations after observing new information. The hindsight bias prevents people learning from their own mistakes, since they are unable to remember those mistakes. People are unable to recognise their own errors. There is self-denial about past errors. If someone has a self-image of being a clever investor, past errors in forecasting may be subject to distortions of memory aimed at maintaining the self-image. Memory is never a faithful recollection of the past; it is amended by the human mind.

Good decision-making in financial markets relies on learning from the past. Learning may entail the comparison of new information with previous expectations. This requires an accurate recall of previous expectations. The hindsight bias involves the contamination of recollections of expectations by new information. The recalled expectations of an outcome are biased towards information about the outcome. The person remembers forming an expectation that is close to what subsequently happened.

Another psychological bias, which is related to overconfidence, is referred to as optimism or as self-enhancement bias. Most people believe that they are above average. Researchers have found that this belief relates to choosing investments, academic performance, and driving ability.

To the extent that some investors attribute profits from rising markets to their own talents, rising markets could be self-perpetuating. Overconfident investors may be encouraged to invest further and thereby reinforce an upward movement in stock prices. Conversely a falling market reduces confidence and investing. This is consistent with the view that markets exhibit over-reaction; they rise too high and fall too low (known as the over-reaction hypothesis). It also helps to explain why small investors tend to buy following market rises, and sell following falls.

Another bias based on optimism is the outcome bias, which causes people to expect to get what they want. Decisions are made in the expectation that what is wanted to happen will happen; in other words,

wishful thinking. An investor may expect a high return on an investment because a high return is what is wanted. This could generate overconfidence (excessive confidence in expectations) and an underestimation of risk. Overconfidence could be based on excessive belief in one's own talents or on the belief that events will turn out to be favourable. In both cases investors may overestimate the accuracy of their forecasts and underestimate risk when making investment decisions.

Some other biases have similarities with the concept of Overconfidence. As a result of the Confirmation Bias investors pay more attention to evidence that supports their opinions than to evidence that contradicts them. This can bolster overconfidence and cause investors to persist with inappropriate investment strategies. Investors are likely to look for information that confirms their opinions. There is evidence that people give more credence to believable conclusions from illogical reasoning than to unbelievable conclusions based on logical reasoning (Evans and Curtis-Holmes, 2005). In other words prior beliefs can dominate reason when evaluating alternative conclusions. There is evidence for an assimilation bias whereby the same information receives different interpretations according to previously held views (Carlson and Russo, 2001). Two sides of an argument may both interpret a piece of information as supportive of their position. There is evidence that people tend to make decisions based on stories constructed around facts rather than upon the facts themselves (Mulligan and Hastie, 2005). This could lead people to favour information, which is consistent with their stories (explanations of events).

Another cognitive bias is the illusion of control. In some circumstances people behave as if they were able to exert control where this is impossible or unlikely; such control includes the ability to identify future outperformers. The illusion of control, together with overconfidence, may explain why so many investors choose actively managed funds when tracker funds outperform them and have lower charges. A study by the Financial Services Authority has confirmed the findings of academic studies which found that the relative past performance of actively managed funds is no indicator of future relative performance. It may be that overconfidence in their own selection abilities, and the illusion of control provided by the facility of choosing between funds, cause investors (or their financial advisers) to select actively managed funds when tracker funds offer better potential value. (Of course financial

advisers might be influenced by the fact that actively managed funds typically pay higher commissions.)

According to Langer (1975), people often find it difficult to accept that outcomes may be random. Langer distinguishes between chance events and skill events. Skill events entail a causal link between behaviour and the outcome. In the case of chance events, the outcome is random. People often see chance events as skill events. When faced with randomness, people frequently behave as if the event were controllable (or predictable). If people engage in skill behaviour, such as making choices, their belief in the controllability of a random event appears to become stronger. There is considerable evidence that investment managers are unable to consistently out-perform stock markets. This suggests that the outcome of investment management is random. However since the investment managers engage in skill behaviour, analysis and choice, they tend to see portfolio performance as controllable. Retail investors and financial advisers are also likely to see the performance of their investment choices as controllable; the act of choosing enhances the Illusion of Control.

Self-deception is increased by the distorting effects of memory. Memory is not a factual recording of past events. Memories are influenced by many personality and emotional factors. To some extent people remember what they want to remember. Inaccurate memories can lead to poor decisions. Goetzmann and Peles (1997) and Moore, Kurtzberg, Fox and Bazerman (1999) investigated the recollections of investors. They found that investor memory of the past performance of their investments was better than the actual performance of those investments. People tend to have a self-image of being good investors and want to believe that their investment decisions have been good. The mind perceives the past in such a way as to be consistent with the self-image. The mind feels uncomfortable with information that contradicts the self-image. This is known as cognitive dissonance. The mind will adjust memory in order to reduce cognitive dissonance and maintain the positive self-image.

It is not just memory that adjusts in order to maintain a positive self-image. Planning might be adjusted. For example a young person with a self-image of being fit and attractive might avoid saving for a pension since the idea of retirement produces a self-image of being old in the future.

### **Heuristic Simplification**

Heuristic simplification arises from the limitations of people's cognitive powers (such as memory and thought). It involves the process of using shortcuts to deal with complex decisions. Rules-of-thumb are examples of heuristic simplification. Such shortcuts can produce a tainted perception of the situation being thought about.

Representativeness helps to explain why many investors seem to extrapolate price movements. Many investors appear to believe that if prices have been rising in the past then they will continue to rise, and conversely with falling prices. The concept of representativeness suggests that this is because those investors see an investment with recent price increases as representative of longer-term successful investments, conversely with price falls. For example Byrne (2005), when researching the behaviour of retail consumers of institutional investments, found that the provision of past performance information appeared to create an expectation of future returns around the same level as the past returns.

Another result of representativeness is a tendency to assume that good companies are good investments. Good firms are often seen as representing good investments. The issue of whether a share is a good investment depends upon whether it is over-, under-, or fairly-priced. Shares of a good company may be overpriced, and hence would not represent a good investment. Shares of a weak company may be under-priced, and hence are attractive as an investment. An example of this error was the enthusiasm for the 'nifty-fifty' stocks (actually 76 stocks) in the US in the early 1970s. The firms were seen as so good that their shares were considered to be a good buy at any price (Fesenmaier and Smith, 2002). The demand pushed the stock prices up to unrealistic levels. Subsequently, as the mispricing was gradually corrected, the nifty-fifty stock prices showed relative declines and most of them under-performed the market over the following decades (Wal-Mart was an exception).

The findings of Cooper, Dimitrov and Rau (2001) can be interpreted as evidence of Representativeness. They investigated companies that added '.com' or '.net' to their names between June 1998 and July 1999 (a period during which the internet stock bubble was developing). They found that those companies provided an average return, between 15 days before the name change to 15 days

after, that was 142% above that of similar companies. For the companies whose business had no relation to the internet, the figure was 203%. It would appear that investors saw companies with .com or .net in their names as representative of potentially highly successful companies. Cooper, Gulen and Rau (2005) found that mutual funds (unit trusts) can increase the flow of investment funds from retail investors by changing their names to something that reflects recently successful investment styles.

The effects of representativeness on thinking and decision-making can be illustrated by the following example. A man has recently been convicted. You are told that he is aggressive, short-tempered, and has a history of violence. You are asked to guess whether his conviction was for murder or speeding. It is likely that many people would guess murder. This is because the description fits the popular image, or stereotype, of a murderer. The man is seen as representative of murderers. However, since speeding convictions vastly outnumber murder convictions, it is much more likely that the conviction was for speeding.

Next consider a coin being tossed five times. If there were five heads would you take the view that the coin is biased? Many people might take that view since a run of five heads would be seen as representative of biased coins. Five successive heads does not fit the image or stereotype of randomness. However there is a 3.125% chance that an unbiased coin would produce a run of five heads. Since the number of unbiased coins is vastly greater than the number of biased coins, it is much more likely that the coin is an unbiased one that has produced five heads purely by chance.

Next consider a unit trust that has beaten the average performance of similar trusts in five successive years. Do you consider the fund manager to have investment skills that are superior to the average? Bearing in mind the wealth of evidence that past performance is no guide to future performance, and that relative performance in successive years appears to be random, perhaps the appropriate conclusion is that the run of five successive good years has occurred by chance. However many people are likely to conclude that the fund manager has superior investment skills. There is evidence that a run of successes tends to attract a lot of investors to a unit trust. A unit trust with a recent run of success is seen as representative of long-term strong performers.

Another feature of representativeness is that it can lead investors to the belief that an investment that is good in one respect will be good in other respects (Shefrin, 2001a). As a result investors may see low risk as associated with high returns, and high risk as associated with low returns. This runs counter to generally accepted expert opinion. It is similar to the halo effect, which suggests that something with some positive characteristics will be expected to have other positive characteristics (and something with some negative characteristics would be expected to display other negative features).

The concept of conservatism suggests that investors are slow to change their views following the receipt of new information. This may help to explain why small investors often delay investing until the market has risen for a period of time. It has been observed that small investors often invest just before the market peaks, and sell just before it troughs.

A concept related to conservatism is anchoring. People are heavily influenced by past, or suggested, prices when forming judgements about appropriate prices. The past, or suggested, price acts as an anchor that becomes the basis for forming a judgment. This applies to various markets, not just stock markets. For example Northcraft and Neale (1987) have shown that anchoring operates in the housing market. They took two groups of estate agents to a house. One group were told that the asking price was \$119,900 and the second group were told \$149,900. When asked to give their own valuations the first group averaged \$117,745 and the second averaged \$130,981. This suggests that the best strategy when selling a property is to set the asking price at the top of the range of possibilities (and when buying a newly-constructed property it is probably safe to assume that the house builder has done the same).

Professional analysts, such as stockbrokers, appear to be subject to anchoring. It might be thought that if an analyst suggests an appropriate price for a share and the share price subsequently moves away from that level, an investor would see a trading opportunity. For example, a fall in the share price below the analyst's forecast should indicate a buying opportunity. Unfortunately for the private investor, the effect of the share price move seems to be that the analyst moves the forecast in the same direction as the share price. The share price appears to be used as an anchor. Cornell (2000) demonstrated this effect in relation to Intel. Those results were consistent with studies by Womack

(1996), and Brav and Lehavy (2001) whose findings showed that adjustments subsequent to analysts' forecasts took the form of the forecasts being changed towards actual prices rather than actual share prices moving towards the forecasts.

Montier (2007) suggested that market forecasts are used as anchors, even when they lack credibility. He provided evidence that some market professionals take the view that a poor forecast is better than no forecast. This indicates that investors need an anchor, even if that anchor lacks reliability and credibility. First impressions and rough calculations can anchor subsequent thinking (Hammond, Keeney and Raiffa 1998).

A belief, irrespective of where it comes from, can constitute an anchor. The belief is used as an initial reference point and it is slowly adjusted to arrive at a final judgment. Even when people know that they are anchoring, they find it difficult to free themselves of the anchor (Piatelli-Palmarini 1994).

Considered re-evaluation will not completely remove the original anchor. Anchors tend to be amended gradually rather than replaced completely.

Samuelson and Zeckhauser (1988) suggested the existence of a status quo bias (alternatively known as an endowment bias). People have a tendency to hold the investments they already have and exhibit some reluctance to change them. Status Quo Bias appears to increase as the number of investment options increases. The more complicated the investment decision, the greater the likelihood that the investor chooses to change nothing. Kempf and Ruenzi (2006) confirmed this finding. They found that, when choosing a mutual fund (unit trust), individuals tended to choose one that they had chosen previously. This tendency to repeat choices was found to strengthen as the amount of choice increased. Ameriks and Zeldes (2000), in a study of pension scheme members, found that the reluctance to change investments was stronger in relation to investments already made than with regard to new contributions. About half of scheme members made changes to future contributions but only about a quarter changed past accumulated investment allocations.

Lin, Chuang, Kao and Kung (2006) found that the strength of the endowment effect (status quo bias) depended on the emotional state of the investor. They found that the endowment bias only occurred

when people felt happy, and it was absent when they felt sad. Lerner, Small and Loewenstein (2004) found that two negative emotions, sadness and disgust, had opposing effects on the endowment bias. Disgust enhanced the endowment effect, whereas sadness reduced it. These studies indicated that emotion and mood could affect cognitive biases and hence decisions.

Narrow framing refers to the tendency of investors to focus too narrowly. One aspect is focus on the constituents of a portfolio rather than the portfolio as a whole. Since individual investments tend to be more volatile than the investor's portfolio as a whole, such narrow framing causes investors to over-estimate price volatility. This could cause people to invest too little.

Another dimension of narrow framing is the focus on the short term even when the investment horizon is long term. It is not rational for an investor accumulating assets for retirement 25 years hence to be concerned about the week-to-week performance of the portfolio. Yet long-term investors do focus on short-term volatility. Studies have shown that when, in experimental situations, people have been presented with monthly distributions of returns they are less likely to invest than when they are shown annual distributions (with the annualised volatility being the same in both cases). The implication is that focus on short-term volatility deters investment. It appears that people do not appreciate the effects of time diversification. By time diversification is meant the tendency for good periods to offset bad periods with the effect that the dispersion of investment returns does not increase proportionately with the period of the investment. Investors who focus too much on short term fluctuations over-estimate stock market risk and allocate too little of their money to stock market investment.

Another bias is availability (alternatively known as retrievability), which suggests that more attention is given to the most easily recalled information. The ease with which specific information can be recalled from memory affects judgments about the relative frequency and importance of events. This causes overestimation of the probability of well-publicised, vivid and recent events (Schwartz 1998). People are more likely to remember occurrences that induce emotions, are very dramatic and have been experienced recently. Availability is consistent with the over-reaction hypothesis, one dimension of which is the over-emphasis on recent information and recent events when making investment decisions.

In terms of investments, one source of information is press coverage. If availability operates, stocks that receive (favourable) press coverage are relatively likely to be bought in large numbers and hence more likely to be over-priced. Gadarowski (2001) confirmed this by demonstrating that shares with extensive press coverage subsequently performed poorly (there was a relative decline from excessively high prices). Katona (1975) indicated that what the media reports could have considerable influence on social learning. The behaviour of large segments of population can change suddenly in response to news. Availability can also lead people to the belief that investment skills are more common than they actually are. Press coverage of successful fund managers such as Warren Buffett and George Soros greatly exceeds press coverage of poor managers. In consequence the retrievability of such coverage can result in the impression that many investment managers are capable of out-performing stock markets. Stock market crashes are vivid and dramatic events capable of invoking emotions. They also tend to receive considerable media coverage. In consequence many investors may have an exaggerated view of the likelihood of crashes.

Ambiguity aversion (alternatively known as familiarity bias) suggests that investors prefer to invest in companies that they feel they understand. Over 90 per cent of the equity investments of investors in the US, UK and Japan is in companies in their own countries. This home bias exists despite the demonstrated benefits of international diversification. The preference for the familiar results in the holding of portfolios that are insufficiently diversified. In consequence investors bear more risk than is necessary. Frieder and Subrahmanyam (2005) found that individual investors prefer stocks with high brand recognition.

Related to ambiguity aversion (familiarity bias) are findings that investors may be affected by the image of a company or sector. For example pharmaceutical companies may have an image of 'health and beauty' whereas chemicals companies might have an image of 'dirty and polluting'. MacGregor, Slovic, Dreman, and Berry (2000) showed that image affected investment decision-making. They found that a positive image enhanced judgements of recent performance, expectations of future performance, and the willingness to invest.

Research on the psychology of expert knowledge has indicated that changes in the level of someone's knowledge can result in adjustments to that person's perception of risk (Ricciardi 2008). Novices may have higher perceptions of risk than experts. People who, due to a low level of knowledge, find investment products difficult to understand could have an increased level of anxiety and fear concerning those investments.

Ambiguity aversion suggests that increased knowledge (or the feeling of increased knowledge) about an asset renders investors more prepared to invest in it. Benartzi and Thaler (1999) found that people are more willing to invest in a stock when an explicit distribution of potential returns is provided. This is an extension of the principle established by Ellsberg (1961) who found that many people prefer to bet on a single ball drawn from a tub known to contain 50 black and 50 red balls than on a ball drawn from a tub with 100 balls of unknown proportions of black and red balls (the former situation may be seen as providing risk and the latter as providing uncertainty).

This could also be seen as an example of Frame Dependence, which means that decisions are affected by the way in which the choices are presented. Kahneman and Tversky (1979) found that an individual may reject an investment when it is presented in terms of risks surrounding gains but may accept when the presentation is in terms of risks relating to losses.

Frame Dependence can be illustrated by a coin-tossing choice. One option is that there is a prize of £100 for tails. The other option is a gift of £100, which is contingent on a coin toss such that heads would entail the loss of the £100. In both cases tails provides £100 and heads provides nothing. However people are more likely to choose the second option. People are more willing to take a bet when it is expressed in terms of losses than when it is presented in terms of gains.

In relation to investment decisions, it has been found that the way information is framed will influence choices. For example different stock indices can change at different rates. At the time of writing, the FTSE All-Share Index has risen substantially more than the FTSE 100 Index over recent years. If the performance of a fund is presented in relation to the FTSE 100, it would appear to be much more impressive than if its performance is presented relative to that of the FTSE All-Share Index. As another

example it has been found that if stock market returns averaged over thirty years are presented, people are more likely to invest than if thirty single year returns are presented. Many single year returns are negative, but no thirty-year period has yielded negative returns.

Diacon and Hasseldine (2007) investigated framing effects and found that the presentation format of prior performance affected investment fund choice. They found that presenting past information in terms of fund values as opposed to percentage yields significantly affected investment choices. The alternatives were charts one of which showed the accumulated growth in the value of a fund over time relative to a base value, such as 100, and the other showed a series of vertical lines indicating the growth in each year. The charts of cumulative value growth evoked considerably more positive response than series of growth rates. The presentation of a series of vertical lines indicating annual growth rates produced perceptions of greater risk.

Benartzi and Thaler (1999) found that pension plan participants responded considerably more positively to stock investments when longer-term returns were presented than when one-year returns were shown. They described the framing effect from the presentation of one-year returns as myopic loss aversion. Loss aversion is high sensitivity to losses relative to gains and myopia refers to excessive frequency of monitoring investment returns. The result is excessive sensitivity to short-term losses, which disinclines participants from investment in equities (shares).

Choice Bracketing could be defined as 'a series of local choices that each appear to be advantageous but which collectively lead to a bad global outcome' (Read, Loewenstein and Rabin, 1999). People are seen as making appropriate decisions within narrow frames but, when these decisions are aggregated, the overall outcome is not the best possible. For example if each new investment is made without regard to the overall portfolio, whilst each investment seen in isolation may seem rational the resulting portfolio may be unbalanced and poorly diversified. Another example relates to investment horizons. If an investor uses a short horizon, such as one month, for evaluating the risk-return characteristics of investments the resulting portfolio may not be the best from a longer-term perspective. Evaluating investments on a month-by-month basis may lead to the choice of bank deposits in order to avoid the high short-term volatility of stock market investments. However if the objective is to accumulate a

pension fund over 35 years, bank deposits would be a poor choice since they provide a low long-term return compared to stock market investments. The investor should consider the risk-return characteristics of investments from a 35-year perspective, not from a one-month perspective.

Mental Accounting is the process of separating financial decisions rather than seeing them in aggregate (Thaler 1985). Someone who simultaneously has a bank deposit with a low interest rate and a debt at a high interest rate exhibits mental accounting. Perhaps the bank deposit is regarded as saving for the deposit on a house, and the debt was incurred for the purchase of a car. By separating the two financial decisions the person is losing money. It would have been better to finance the car purchase by taking money (i.e. borrowing) from the house deposit money and then making repayments into that bank account. There would have been a net saving of interest.

Mental Accounting can be similar to Choice Bracketing in its effects. Someone may have a portfolio of investments but allocate investments to various mental accounts. This leads to a focus on components of the portfolio rather than the whole portfolio. For example a person may have investments in a pension fund and simultaneously hold investments in Individual Savings Accounts (ISAs). In order to achieve a well-diversified portfolio of investments, the person should take account of the nature of the pension fund investments when deciding upon the ISA investments. If the pension money is invested in a UK growth fund, it may be appropriate to invest the ISA money in a different fund. Diversification reduces dependence upon one fund, or type of fund, and hence reduces the potential effect of relative under-performance on the person's total wealth. The investor should see the investments in aggregate rather than allocate them to mental accounts, which are then considered in isolation.

This goes beyond financial portfolios. Three major forms of wealth are financial assets, residential property, and human capital (i.e. future earnings). These three should be seen in aggregate rather than allocated to three mental accounts. For example holding one's financial wealth in the form of shares of the company, for which one works, produces an excessive dependence upon the success of that company. When deciding on financial assets the nature of the other assets should be considered. Financial investing should not be seen in isolation from the other assets, that is it should not be put into a separate mental account. Since shares tend to have returns unrelated to those from property and

human capital, they should have a place in a well-diversified portfolio. Shares may provide good returns at times when property and human capital are under-performing. In the context of the overall portfolio shares may reduce risk (see chapter 13). The tendency of people to put them into a separate mental account leads to an exaggeration of their risk. This may help to explain why so many people are reluctant to invest in the stock market (Barberis, Huang and Thaler 2003).

Mental Accounting helps to explain the preference for high dividend yield shares on the part of many investors (Statman, 1997). Some investors take a 'never touch the capital' approach when investing for income. Capital growth could be converted into income by selling shares, but this is not allowed by the mindset. Although cashing in on capital growth by share sales is an alternative source of income to dividends, the investor feels that it would be reducing the capital. The only acceptable source of income comes from dividends. This separation of dividends and capital is a manifestation of Mental Accounting.

Mental Accounting can be used to produce examples of Frame Dependence. Consider the offer of a bet in which £15 is received from a coin toss that is heads, against a loss of £10 with tails. Also consider the offer of a bet in which if heads result you keep all the money you have already plus £15, whereas with tails you keep all your money except £10. People tend to prefer the second bet despite the bets being identical. In the second bet the offer is framed in such a way that it removes Mental Accounting. The bet, seen in isolation, is less attractive than when it is seen in the context of the person's existing wealth.

Hedesstrom, Svedsater and Garling (2004, 2007) studied the use of heuristics in the context of the Swedish Premium Pension Scheme, which is a compulsory pension scheme allowing subscribers to choose between a large number of funds. If a participant failed to express a preference, their funds were invested in a default fund. The study identified some heuristics and also investigated whether the amount of interest (involvement) shown by participants affected the use of heuristics. The heuristics found to be operating included a default bias, which is the tendency to choose the default fund. This could reflect a view that the default fund was the fund recommended by the pension plan managers. There was a tendency to avoid funds with either extremely high or extremely low risk; referred to as

extremeness aversion. Another heuristic was a tendency to choose own-country funds (familiarity bias, ambiguity aversion). Also there was a tendency to divide investments evenly between the chosen funds; known as the  $1/N$  bias on the grounds that  $1/N$  is allocated to each of the  $N$  chosen funds.

Hedesstrom, Svedsater and Garling considered the possibility that the use of heuristics was related to the level of investor motivation. It could be the case that participants showing little or no interest (involvement) in the investment choice are more likely to demonstrate the use of heuristics than more motivated investors. Although those showing high involvement were less prone to the default bias, they were no less susceptible to other heuristics such as the familiarity bias and the  $1/N$  heuristic.

### **The Catering Theory of Dividends**

According to the catering theory of dividends (Baker and Wurgler 2004) investors have a desire for dividends, and that the resulting demand for dividends varies over time. In consequence there will be times when the prices of dividend-paying shares will be bid up relative to the prices of non-dividend-paying shares. Companies will adjust their dividend policies in response to this time-varying demand for dividends. Firms initiate (or withdraw from) payment of dividends when investors have a particularly strong (or weak) demand for dividends. Periods of high demand for dividends are accompanied by increased dividend pay-outs.

Gemmill (2006) provided support for the catering theory of dividends using evidence from split-capital investment trusts in the UK. He observed that over the period 1998-2001 split-capital funds traded at a 9% premium (were worth 9% more) relative to conventional investment trusts. He found that this arose from an increase in the demand for dividends on the part of retail investors. He also observed that there was a large increase in the number of such funds issued during that period. The increase in new issues was interpreted as a response to a demand for high-dividend investments.

Unlike conventional investment trusts, split-capital investment trusts can provide high-dividend investments by splitting themselves into different classes of share. One such class is the income (or dividend) share, which pays all the dividends earned by the fund but at the cost of foregoing potential capital gains from share price rises. Gemmill suggested that the rising stock market at the time had

reduced the rate of dividend yield (the dividend yield is the dividend divided by the share price, so a rise in the share price reduces the dividend yield). In search of dividends some investors turned to split-capital investment trusts. Gemmill noted that at the time investment trust advertising emphasised yield.

It may be that the 'never touch the capital' attitude of some retail investors makes dividends a salient feature which is valued. This can lead to high prices for investments that offer high dividend payments.

### **The Social Dimension**

In addition to personal biases there are biases that result from social influences. Schachter, Hood, Andreassen, and Gerin (1986) related the degree, to which a person is dependent on what others think and do, to a number of factors. Social influence is strongest in conditions of uncertainty and when self-confidence is low. It is also strong when circumstances change substantially, and rises with the extent that previously held views are demonstrated to be incorrect. Asch (1952) conducted experiments that showed that people were inclined to follow others even when they felt that the others were wrong, he called this 'conformity'.

Hong, Kubik and Stein (2004) found that social households in the US were more likely to invest in the stock market than non-social households. A social household is one in which the members interact with other people in the neighbourhood. Information is obtained and opinions are formed through talking with others. In consequence social people are more likely to become interested in, and learn about, investing than less socially active people. Shiller and Pound (1989) found that when an investor pays attention to a stock it is often (more than 50% of cases) because another person has mentioned the stock to the individual. Subsequent to buying the stock, the investor is likely to speak about it to a number of other people.

Duflo and Saez (2002) investigated pension scheme participation in the US. They suggested that the decision to participate was strongly influenced by the social norms of peer groups. People in a peer group tend to develop the same attitudes as other members of the group. The group studied was very homogeneous in most respects (they were university librarians). Despite a large degree of uniformity in respect of characteristics such as education and income, there was a wide variation in pension scheme

participation rates between locations. Participation rates varied between 73% and 14%. Duflo and Saez took the view that the variation could be explained in terms of differences in social norms, or culture, between the different locations.

Kelly and O Grada (2000) investigated the behaviour of Irish immigrant communities in New York in the 1850s. Bank panics occurred in 1854 and 1857. The researchers looked for factors that influenced the likelihood that someone would withdraw money from their bank during the panic. The most important factor was the county in Ireland from which a person came. People from some counties were more likely to join the panic and withdraw money than people from other counties. The county of origin also tended to determine a person's social network. People from a particular county were prone to associate with people from the same county, so that there were social groupings based on county of origin. This appears to be further evidence that financial decisions are influenced by a person's social environment.

### **The Influence of Emotion and Mood**

Investment decisions can be affected by unrelated emotions (Loewenstein, Weber, Hsee and Welch 2001; Slovic, Finucane, Peters and MacGregor 2002). A favourable sports result or good news about a friend can engender a good feeling, and the good feeling can affect investment decisions. The effect of emotions increases with the complexity and uncertainty surrounding the decision. Decisions about complex and uncertain matters are particularly influenced by emotions (Forgas 1995).

Studies by psychologists have found that mood appears to affect predictions about the future. People in a good mood are more optimistic about the future than people in a bad mood (Wright and Bower 1992). The impact of mood on financial decisions has been referred to as the 'misattribution bias' (Nofsinger 2005). If a person is in a good mood, there will be a tendency to be optimistic when evaluating an investment. Good moods may cause people to be more likely to make risky investments (for example choosing shares rather than bonds).

Weather and the length of daylight are factors that can affect mood. The effects of such factors on investment decisions have been researched. Hirshleifer and Shumway (2003) investigated the effects

of sunshine on stock market returns. When the sun is shining people feel good. This may increase optimism and affect investment decisions. It may be the case that investors are more likely to buy shares when the sun is shining. The purchases would cause stock prices to rise. Stock markets in 26 cities were examined. It was found that stock market returns (price increases) were higher on sunny days. When comparing the sunniest days with the worst days, it was found that there was an annualised difference of 24.6% on average. This evidence further indicates a relationship between mood and investment decisions.

Kamstra, Kramer, and Levi (2003) looked at the relationship between hours of daylight and stock market returns. They found that stock markets performed relatively poorly during the autumn as the hours of daylight fell. This was most marked for the more northerly stock markets. Consistent with the theory was the observation that the effect occurred over October to December in the northern hemisphere, and over April to June in the southern hemisphere. This study is consistent with the view that sunlight affects mood and mood affects investment decisions. Sunlight enhances optimism about the future and the prospective future returns from investments.

According to the socio-economic hypothesis (Prechter, 1999; Nofsinger 2005) moods can be transmitted through social contact and a widely shared, or social, mood emerges. Contact between people conveys mood as well as information. Collectively shared moods influence individual decisions, with the effect that trends emerge. At times mood can dominate reason in the decision-making process. It has been found that people in depressed moods are less willing to take risks (Yuen and Lee, 2003) and a negative mood is associated with a desire for asset preservation and safety (Kavanagh, Andrade, and May 2005). Positive mood renders people more trusting (Dunn and Schweitzer, 2005), and for many people trust in the financial services industry is a big issue when considering investments. Positive social mood results in perceptions of trustworthiness, low risk and high returns whilst negative social mood is associated with low trust, high perceived risk and low anticipated returns (Olson, 2006).

It has often been suggested that investors in institutional investments such as unit trusts and OEICs have a tendency to buy when the market has risen and to sell after the market has fallen. The tendency to buy when prices are high, and to sell when they are low, could be explained by social mood. As

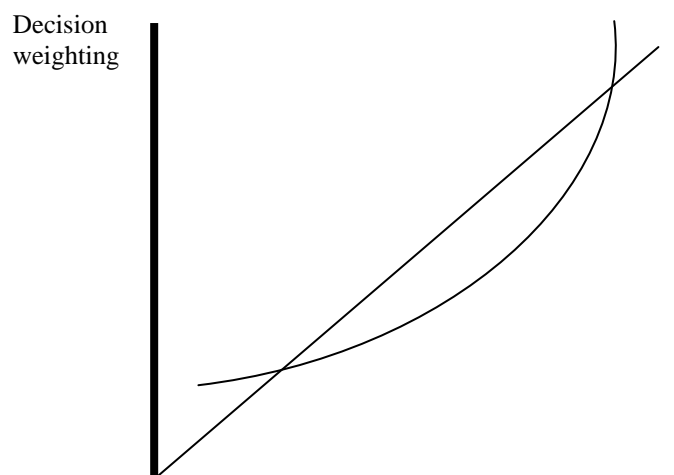
social mood reaches its peak the level of optimism in society draws more people into investment. The optimistic social mood causes, normally very risk-averse, investors to begin investing. They buy at the peak of social mood, which coincides with the peak of the stock market. Conversely the pessimism associated with low social mood leads to the selling of investments, just when the stock market is at its lowest. This helps to explain the tendency for many investors, particularly retail investors, to buy at high prices and sell at low prices. Buying at high prices and selling at low prices results in losses.

Alternatively the poor (buy high – sell low) investment strategy may be explained by the ‘house money’ and ‘snake bite’ effects (Thaler and Johnson 1990). After making a gain people are willing to take risks with the winnings since they do not fully regard the money gained as their own (it is the ‘house money’). So people may be more willing to buy following a price rise. Conversely the ‘snake bite’ effect renders people more risk-averse following a loss. The pain of a loss (the snake bite) can cause people to avoid the risk of more loss by selling investments seen as risky. The ‘house money’ and ‘snake bite’ effects are contradicted by the predictions of prospect theory.

### **Prospect Theory**

Prospect theory is arguably the most developed theory in behavioural finance (Kahneman and Tversky 1972, 1973, 1982). There are three key elements to prospect theory. (1) Perceived probabilities are subject to bias, (2) investors are more concerned about gains and losses than levels of wealth, and (3) investors feel losses more than gains.

In relation to perceived probabilities, the biases are tendencies to exaggerate small and large probabilities and under-weight medium ones. See figure 2.1.



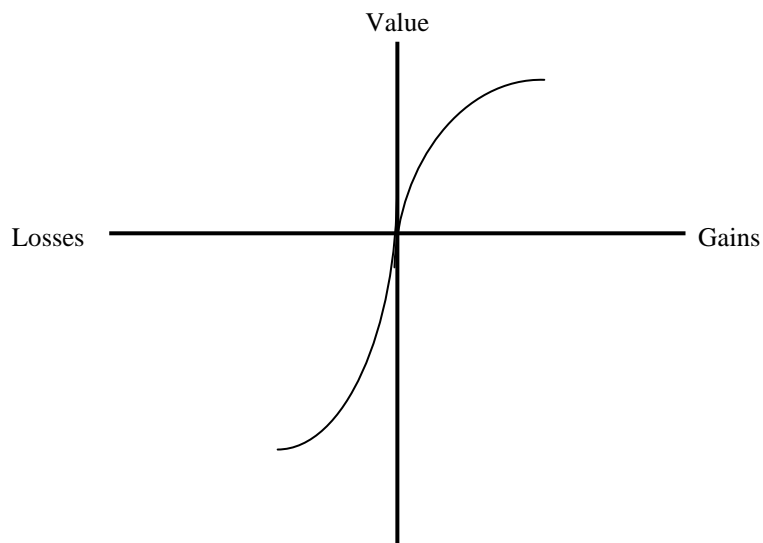
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Objective probability

**Figure 2.1**

In figure 2.1, subjective (perceived) probabilities are referred to as decision weightings. When plotted against actual probabilities the decision weights are too high at low and high probabilities and too low at medium probabilities. The exaggeration of low probabilities may help to explain the popularity of lotteries. The exaggeration of high probabilities suggests that highly likely (but not certain) events are treated as being certain.

Figure 2.2 is a value function. It depicts subjective values assigned to gains and losses relative to a reference point. The reference point is subjective and may, for example, be the purchase price of an investment. The reference point divides the region where someone feels that they are making gains from the region in which they feel that they are making losses.

**Figure 2.2**

It is to be noted that the slope of the function for losses is steeper than the slope for gains. This is because, on average, people find the pain of losses to be about 2.25 times as intense as the pleasure from gains. Given an even chance of winning or losing, people on average require the prospect of a £225 win to balance the prospect of a £100 loss. This relatively large fear of loss, known as loss aversion, will tend to deter retail investors from stock market related investments. The ratio of the pain of loss to the pleasure of gain is about 70/30. The ratio of years in which the stock market falls to the number in which it rises is about 30/70. If investors checked the market more frequently than once a year, the ratio of losses to gains would be higher. Loss aversion could be a strong inhibitor of stock market investment. Loss aversion may explain the popularity of guaranteed equity funds, which guarantee that the original investment cannot be lost whilst providing gains from rises in share prices. Guaranteed equity funds are described in the chapter on structured products.

Another feature of figure 2.2 is the tendency for the slope of the value function to become less steep as gains or losses increase. This implies that as gains are made investors will become less inclined to take risks, since the addition to value of a higher gain is less than the reduction in value resulting from a lowered gain. It also implies that as losses increase investors become more willing to accept risk. This is because the value of a loss reduction outweighs the value of a further loss. So, for example, in a losing situation an 'evens' bet looks attractive. An aspect of loss aversion is that people will avoid the risk of making losses (by avoiding risks) when in a gaining situation but will accept risk in order to attempt to recover from a loss. Prospect theory sees investors as being loss averse rather than risk averse.

This behaviour in a loss-making situation is consistent with the idea of an Escalation Bias (Shefrin, 2001). An Escalation Bias leads to 'averaging down' whereby as the price falls the investment is treated as being an increasingly good bargain. The thinking is that if a share was a good buy at £2, it is a fantastic bargain at £1 and more should be bought. It is psychologically difficult to consider the possibility that the initial purchase was at an excessively high price. The rational behaviour would be to consider the possibility that an item of bad news justifies the price fall. The investor's psychology makes it difficult to look for the bad news and its implications for the value of the share.

The psychological difficulty in considering the possibility that the initial purchase was at an excessively high price could be seen as an example of Cognitive Dissonance. Evidence that beliefs or decisions are wrong causes mental stress. This may result in the reluctance to admit an error. Holding a poorly performing investment too long is an aspect of the reluctance to admit that the investment was a mistake.

The reference point is subjective, but is likely to be influenced by one or more past values. Possibilities include the purchase price of the investment, the highest price seen, or an average of observed previous values. Heath, Huddart, and Lang (1999) concluded, on the basis of evidence from the exercise of employee stock options, that the most likely reference point used is the highest price of the previous twelve months. It appears that people periodically update the reference point to reflect unrealised profits. However the study of the Boston housing market by Genesove and Mayer (2001) is consistent with the purchase price constituting the reference point.

Lin, Huang and Zeelenberg (2006), from a survey of investors, concluded that multiple reference points could be present simultaneously. The most important was the outcome from not investing at all. Two other significant reference points were the expected outcome, and the outcome from the best-performing alternative. The outcome from the worst performing alternative was not a significant reference point; the observation that the outcome could have been worse did not appear to provide any comfort. Consistent with the curvature of figure 2.2 was the finding that the direction of deviation from a reference point was more important than the size of deviation in the generation of feelings of regret or pleasure. Contrary to prospect theory, no asymmetry between upward and downward deviations was found. Upward and downward deviations from reference points appeared to have equivalent effects on feelings of regret and gratification.

Since reference points are subjective values they are susceptible to psychological biases. An important feature of reference points is that they appear to be influenced by the form in which information is presented, in other words according to how a situation is framed. For example telling an investor that a portfolio has risen in value by 5% might give the feeling that the reference point has been exceeded whereas saying that it has underperformed a benchmark by 5% could cause a perception of loss, whilst

both statements may record the same outcome. The latter framing is likely to raise the reference level. A statement that share price gains have outweighed losses may cause a different reference level than a statement that some losses have held back the overall profit. The former statement, which is positive, is likely to engender a more positive perception of the outcome than the latter statement, which is negative.

It has been suggested that reference points may evolve over time with the result that loss aversion is accompanied by disappointment aversion (Ang, Bekaert and Liu, 2005; Fielding and Stracca, 2007). Under loss aversion an investor has a fixed reference point, which might be the current level of stock prices or the current value of personal wealth. Gains and losses are evaluated against the reference point. The reference point could evolve according to the investment horizon. If reference points change over time there could be a disappointment aversion in addition to a loss aversion. In the case of loss aversion the pain of losses exceeds the pleasure of gains, when the gains and losses are of the same magnitude. In the case of disappointment aversion the pain or pleasure is brought about by deviations from expectations. The disappointment related to outcomes below expectations is stronger than the pleasure related to outcomes that exceed expectations. Although losses on investments may occur only in the short term, there may be disappointments in the long term. Although there may be gains in the long term, they would result in negative feelings if they fell below expectations. Whether loss aversion and disappointment aversion are alternatives or coexist, the tendency for the pain of loss or disappointment to exceed the pleasure of exceeding reference points could deter investors from risky investments such as stocks.

Reference points can be influenced by self-imposed rules aimed at establishing self-control. People are prone to mental accounting, with different investments being allocated to different purposes (Kahneman and Tversky, 1982). For example one portfolio may be for the purpose of funding retirement whilst another is for financing children through university. Mental accounting keeps these two portfolios separate so that neither is subsidised by the other. It may be that in aggregate the two portfolios are showing strong gains whilst one is showing a loss. The mental accounting will cause the perception of loss, in relation to a portfolio, despite the overall profit. One frequent rule for self-control is 'never touch the capital'; this means that dividends and interest, but not the capital sum, should be

used to finance spending. A low dividend may lead to a forced withdrawal of capital. There may have been a strong capital appreciation, but the mental accounting that separates capital and dividends could result in feelings of failure and loss. Another example of how the framing of information influences perceptions is the line often used by financial advisers when attempting to sell regular savings schemes: a share price rise is good because you become richer but a fall is also good because your money buys more shares (these are both positive statements). A client is less likely to be told: a share price rise is bad because your money buys fewer shares but a fall is also bad because you become poorer (negative statements).

Shefrin and Statman (1984a) have argued that investors account for dividends, and capital gains/losses, separately at some times and together at other times. In the event of a small fall in share prices an investor may combine the capital loss with dividends in order to be able to see an overall gain. In the event of a large fall in share prices, the investor may separate them in order to be able to feel that there is a gain in relation to dividends. An implication of this ability to switch mental accounting is that investors prefer a combination of dividends and capital growth to receiving the whole benefit in the form of capital gains.

A report produced jointly by Distribution Technology and The Pensions Institute in the UK (Distribution Technology, 2005) found that pension fund investment was consistent with Prospect Theory. In the context of pre-retirement financial planning, investors who are underfunded and anticipating a low retirement income tend to take a high level of investment risk in an attempt to remedy the underfunding. This is consistent with the observation that people in a loss-making position are more willing to accept risk than people in a profit-making position.

The report put investors into three categories. The first category, which accounted for more than a half of people, was distinguished by 'loss avoidance'. This category was characterised by a refusal to take any risk. In terms of Prospect Theory, this group exhibited 'total loss-aversion'. The second category (the smallest) was distinguished by 'extreme loss aversion'. Whilst prepared to take some risk, the compensation required to take risk (in terms of expected additional return) was extremely high. The third category (the second largest) was distinguished by 'moderate loss aversion'. It is among this

group that realistic views of long-term investment were found. The third category tended to have relatively high levels of general education and to be relatively young.

### **The Disposition Effect**

Prospect theory appears to be able to explain the disposition effect. The disposition effect is the willingness of investors to sell investments that show gains but not investments that show losses.

Odean (2001) found that investors using a discount brokerage held losing stocks for an average of 124 days and winning stocks an average of 102 days. He also found that an average of 15% of gains were realised against only 10% of losses. Locke and Mann (1999) found that futures traders were also prone to the disposition effect. Further evidence for the disposition effect comes from Ferris, Haugen, and Makhija (1987) and from Schlarbaum, Lewellen, and Lease (1978).

Grinblatt and Keloharju (2001) found that a large positive return in one week increased the likelihood of a sale the following week. A large decrease reduced the likelihood of a subsequent sale. The effects were most pronounced for investment behaviour which occurred very soon after the price moves. The results were common to both individual investors and institutional investors (institutional investors include pension funds, insurance funds, and unit trusts). Statman, Thorley and Vorkink (2006) found that turnover in a particular stock was positively related to recent returns (price movements) on that stock. This is consistent with the disposition effect proposition that investors are more willing to sell following a price rise. They found the relationship to be stronger in the cases of small-capitalisation stocks and earlier time periods, which they saw as evidence that individual investors may be more prone to the disposition effect than institutional investors. Barber, Lee, Liu and Odean (2007) found a disposition effect in the Taiwan Stock Exchange, where investors appeared to be about twice as likely to sell a stock showing a gain than a stock showing a loss. However institutional investors (specifically mutual funds) did not demonstrate the disposition effect.

Genesove and Mayer (2001) examined the disposition effect in the Boston housing market during the 1990s. They found that owners who faced selling at a loss tended to set their asking prices too high. To the expected selling price, they added 25-35% of the difference between the property's expected selling

price and their original purchase price. As a result their houses were on the market for a relatively long time before being sold.

Shefrin and Statman (1984) interpreted the disposition effect in terms of the fear of regret and seeking pride. Selling a loss-making investment triggers feelings of regret. There is a realisation that the decision to buy it was bad. Selling an investment at a profit validates the decision to buy, and produces a feeling of pride. In consequence investors prefer to sell investments whose prices have risen rather than those whose prices have fallen. The disposition effect is reinforced by the tendency for many investors to treat 'paper losses' differently to realised losses. While the position is still held prices could rise; when it is sold the loss is confirmed.

The disposition effect appears to be absent when share price movements are general rather than specific to individual company shares. Nofsinger (2001) found that asset price rises and falls, resulting from news about the general economy, did not result in the disposition effect. This could be interpreted in terms of the significance of personal decision-making. Pride and regret arise when profits and losses can be seen as resulting from one's own decisions. Those feelings are less likely when profits and losses are seen as arising from events outside one's control (Clarke, Kruse, and Statman 1994).

The question arises as to whether psychological biases reflect an investor's personality, whether the biases can be reduced by learning, and whether interaction with others can affect the biases. These matters have implications for financial advisers when dealing with clients who are subject to the biases. Weber and Welfens (2006) have researched these issues in relation to the disposition effect. They tested for individual differences, stability of the bias, and the effects of learning.

They found that there were substantial individual differences in proneness to the disposition effect. While most people appeared to exhibit the disposition effect, some behaved in the opposite manner. Loss realisation aversion (the reluctance to sell investments that were making losses) was found to be much more common than the tendency to sell investments that had risen in price. Investors exhibiting a strong tendency to sell profit-making investments were not necessarily the same as those reluctant to

sell loss-making investments. The study suggested that the two sides of the disposition effect were unrelated.

Weber and Welfens found that investors who were prone to the disposition effect in one choice situation were also subject to the effect when making other choices. For example, an investor prone to the disposition effect when making stock market decisions tended to be prone to the effect when making housing market decisions. The strength of the effect was also stable over time. Someone with a strong disposition effect at one point in time would tend to have a relatively strong disposition effect at a later point in time. There appeared to be individual stability of the effect across different decisions and over time. These observations are consistent with the view that the disposition effect reflects stable personality traits. It was also found that interaction between investors reduced the individual stability of the effect. This suggests that social influences can affect the extent of individual psychological biases.

They found that learning reduced the extent of the disposition effect. The tendency to be affected by the disposition effect was stable when considering the relative strength of the effect between individuals, but the absolute size of the effect was reduced by learning. This is consistent with the view that the effect is the result of a lack of knowledge of investment.

A feature of figure 2.2 is the tendency for the slope of the value function to become less steep as gains or losses increase. This implies that as gains are made investors will become less inclined to take risks, since the addition to value of a higher gain is less than the reduction in value resulting from a lowered gain. This is consistent with the disposition effect since the sale of stocks would achieve a reduction in risk. Figure 2.2 also implies that as losses increase investors become more willing to accept risk. This is because the value of a loss reduction outweighs the value of a further loss. So, for example, in a losing situation an 'evens' bet looks attractive. Again this is consistent with the disposition effect since keeping stocks would avoid a reduction in risk.

The tendency for the slope of the value function to become less steep as gains or losses increase is also consistent with the hedonic editing hypothesis, which posits a preference for integrating losses and separating gains (Lim, 2006). By selling a number of loss-making investments simultaneously, an

investor can reduce the pain of loss since the pain from each additional sale is reduced as a result of the curvature of the value function (the diminishing sensitivity to loss). By selling profitable investments individually the pleasure is maximised since the diminishing pleasure implied by the curvature is avoided; each sale makes its maximum contribution to the feeling of pleasure. Lim found that there was a tendency for investors to sell losing stocks in bundles and gaining stocks separately.

Frederick (2005) presented evidence that the accuracy of the perception of risk, and risk tolerance, are related to a personality characteristic referred to as 'cognitive reflection'. Cognitive reflection is the ability to resist the first impulse or intuition. It is the tendency to reflect and think about a problem rather than following initial inclinations. Low cognitive reflection is associated with a tendency to yield to immediate impulses by making quick decisions with little thought and deliberation. People who are high in cognitive reflection tend to be good at evaluating risky investment situations, and tend to be willing to take risks.

Nofsinger and Varma (2007) cited evidence that suggests a link between cognitive reflection and relative immunity from behavioural biases. They also carried out a survey, which found that professional financial advisers (personal financial planners) were above average in terms of cognitive reflection. Frederick had presented evidence that suggests a link between hyperbolic discounting (i.e. overemphasis on the present) and low cognitive reflection. Nofsinger and Varma provided evidence to support that observation. People with low cognitive reflection fail to see the interest rate implicit in a choice between two different sums of money at different points of time (the present and a future date). Arguably personal financial advisers should be able to see the implicit interest rates in order to provide good advice to their clients. Evidence presented by Frederick and by Nofsinger and Varma also suggested that low cognitive reflection is associated with proneness to the disposition effect (and to loss aversion).

### **The Avoidance of Psychological Biases**

Montier (2003/2004) offered advice on how to counter some of the errors, which arise from psychological biases. His points (somewhat paraphrased) included:

1. You know less than you think.

2. Be less certain in your views.
3. Listen to those who do not agree with you.
4. You did not know it all along; you just think you did.
5. Do not take information at face value; consider how it is presented.
6. Do not confuse good firms with good investments.
7. Easily recalled events are less likely than you think.
8. Be prepared to sell your losers and hold your winners.

It has been suggested that financial advisers should educate their clients not only about financial products, but also about the psychological biases that the clients may exhibit. Farrow (2006) suggested that financial advisers should recognise the role emotions play in the decision-making of their clients and should help them to manage those emotions. Attempts at eliminating negative behaviour on the part of clients can be an important part of an adviser's service. Farrow proposed that the recommendation of index-tracker funds could be useful to such a process. However there is a danger that an adviser who attempts to correct psychological biases, and to remove emotion from decision-making, may find that clients go to another adviser who treats the biases as preferences to be accommodated.

### **Saving and Self Control**

Thaler and Shefrin (1981) describe the self-control problem as the interaction between a person's two selves: the planner and the doer. The doer wants to spend now rather than later, and delays unpleasant tasks. The planner is inclined to save for the future and get unpleasant tasks dealt with quickly. There is a conflict between desire and willpower as a result of the influence of both short-term emotion and long-term rational concerns.

Deaves, Veit, Bhandari and Cheney (2007) identified a propensity to plan. They found that pension contributions were positively correlated with the propensity to plan. They also found that those with a high propensity to plan had high tolerance of risk. They interpreted this relationship in terms of planners acquiring financial expertise, and hence learning that acceptance of risk is part of financial planning. This may indicate that training programmes would help personal financial planning. However Mandell and Klein (2007) found that the acquisition and retention of financial expertise

depended heavily on motivation. Deaves, Veit, Bhandari and Cheney cited studies indicating that financial training could enhance motivation, in the sense of the propensity to plan (Bernheim, Garrett and Maki 2001; Mann, Beswick, Allouache and Ivey 1989).

When making decisions involving the present there is a tendency to procrastinate. For example most people would rather receive £50 now than £100 in two years (foregoing a 41% p.a. return) whereas £100 in six years is preferred to £50 in four years. From a finance perspective the two choices are the same, except one is deferred (Ainsle 1991). People seem to view the present very differently to how they view the future. The attitude to the present appears to be characterised by strong desire and weak willpower. The emphasis on immediate satisfaction has been referred to as hyperbolic discounting.

Choi, Laibson, Madrian and Metrick (2001) found that many low savers actually wanted to save more. They found that two-thirds of their sample recognised that they were saving too little. The problem was one of willpower. They also found that whereas a third of the people surveyed intended to increase their savings rates in the near future, most of those well-intentioned people (86%) did not do so. Procrastination was present; the intended increase in saving was postponed.

Rabinovich and Webley (2007) focused their study on people who had expressed an intention to save. In this way they separated the implementation of an intention from the formation of the intention (arguably the two behavioural processes behind intentional saving). The factors that increase the likelihood that saving intentions are implemented may be different to the factors that lead to the formation of intentions to save. The study identified those who succeeded in implementing their saving intentions as the “plan-and-do” group and those who failed to implement their saving intentions as the “plan-in-vain” group. Time horizon and expenditure control techniques were found to be important factors in the successful implementation of saving intentions.

Time horizon, the inclination to think ahead, has a positive effect on both the intention to save and the implementation of the intention. Rabinovich and Webley found significant differences in time horizon between plan-and-do and plan-in-vain groups. The tendency to think ahead is associated with the successful implementation of saving intentions. The expenditure control techniques, which were found

to help the successful implementation of saving plans, made the saving process automatic and partially independent of willpower. Automatic deduction of saving from salary is an example of an automatic process. Use of mental accounting can also facilitate the implementation of saving intentions. If money to be saved were transferred to a separate account, psychology would give it a different status. The account containing savings is perceived differently to an account for expenditure, and the designation of a separate mental account for savings reduces the likelihood of spending from that account.

To help with willpower people employ rules-of-thumb and environmental controls (Thaler and Shefrin 1981; Hoch and Loewenstein 1991; Nofsinger 2002). Environmental controls include automatic deductions from salary and monthly standing orders into savings or pension plans. Thaler (1994) found that most people, who invested in a pension plan one year, contributed again the following year. They form a habit to help their willpower. However people tend to leave pension contributions until close to the last possible date (Shefrin and Thaler, 1992); they seem to need a deadline in order to assert self-control. Thaler (1994) suggested that people find it easier to save from lump sum payments than from regular income. Saving money from a monthly salary requires more self-control (Thaler and Shefrin, 1981).

It has often been wondered why many investors prefer cash dividends in preference to selling shares as a means of turning capital gains into cash. Selling part of a shareholding as a means of turning a capital gain into cash may have tax advantages relative to receiving dividends. Nonetheless investors frequently prefer to receive cash dividends. This appears to be irrational from the perspective of maximising income. It may be explicable in terms of rules-of-thumb employed to help willpower. One such rule-of-thumb is 'never touch the capital'. The capital, be it a sum of money in a bank deposit or a holding of shares, is treated as being untouchable. This piece of self-discipline ensures that the capital remains intact in order to provide income in the future.

Distribution Technology and The Pensions Institute (Distribution Technology, 2005) found that most retirees with pension funds choose annuities (retirement incomes) that start at a high level, but without rises, in preference to annuities that start lower but rise over time to compensate for inflation. This is consistent with a preference for immediate expenditure.

### **Habitual Non-Savers**

Scottish Widows, the UK financial services company, carries out an annual survey into pensions saving behaviour. The 2005 survey (Scottish Widows 2005) concluded that about 17% of people with sufficient income to save do not do so; this is consistent with the British Household Panel Survey, which suggests that about 18% of people are persistent non-savers (Department of Work and Pensions, 2003). The Scottish Widows figure is possibly an under-estimate since anyone in a defined-benefit pension scheme (i.e. an occupational pension that relates the pension to salary and years of service) is seen as saving, irrespective of whether they save outside the pension scheme, and it excludes people under 30. The non-savers are consistent and habitual non-savers. Differences in income levels do not seem to substantially affect this group; the proportion of non-savers remains fairly constant as income levels rise (considering the 30-50 age group the Scottish Widows survey found that 14% of those earning £30,000 to £40,000 were non-savers, and 12.5% of those earning over £40,000 were non-savers). However the proportion of non-savers declines past the age of 50.

The Scottish Widows survey identified a number of characteristics that appeared to distinguish habitual non-savers from savers. Non-savers are more likely to take a negative view of other people. Non-savers see themselves as relatively less happy, less healthy, less emotionally secure, and as having a worse romantic and social life. Non-savers are more likely to want a complete change in their lives. They are more likely to feel that they are unable to control, and cope with, their situation in life. They are less able to plan ahead. Non-savers are much more likely to be smokers. The main reason given for not saving is that they cannot afford it (even though many have high incomes), and many say that they could not reduce their spending without significantly affecting their life styles. Somewhat paradoxically, non-savers are more likely to believe that they will be able to live comfortably on a low income in retirement.

Non-savers are less likely to own their own homes, and those who do own their homes tend to have less valuable properties than savers (note that the survey was constructed so as to eliminate income and age as explanatory factors). Non-savers are more likely to have non-mortgage debts; they are less likely to see themselves as responsible in their borrowing and in their use of the borrowed money.

The Scottish Widows findings are broadly consistent with the results of the 'Family Resources Survey 2003-04', carried out by the Department for Work and Pensions (Department for Work and Pensions, 2005), which found that 27% of households had accumulated absolutely no savings. It is not surprising that the Scottish Widows survey found that non-savers were less happy, less satisfied and less able to cope with their situations in life. It has been found that debt has a negative effect on psychological well-being (Brown, Taylor and Price 2005) and that people in (non-mortgage) debt are prone to stress, depression and anxiety (Citizens Advice, 2003). It would seem reasonable to presume that, if debt causes stress and psychological disorders, the existence of accumulated savings would improve psychological well-being. Possession of accumulated savings provides a buffer against adversity. Possession of money gives a degree of control over the effects of unforeseen adverse events, and control reduces feelings of stress. Events, which require expenditure to deal with problems, cause much more stress when the required money is not available. Accumulated savings provide a sense of independence, security and control. However the study by Brown, Taylor and Price indicated that it was regular saving, rather than accumulated wealth, that had a beneficial effect on psychological well-being.

Watson (2003) researched the relationship between materialism and saving behaviour. It was found that highly materialistic people were more likely to see themselves as spenders, and were more inclined to borrow. In particular they were favourably disposed towards borrowing for non-essential purposes and luxury items. People with low levels of materialism were more likely to save, and were more likely to own financial investments such as shares and mutual funds (unit trusts).

The complicated nature of the factors that affect the accumulation of debt (and possibly, by extension, saving behaviour) has been highlighted in a study conducted by Stone and Maury (2006). They developed a model capable of predicting indebtedness. The factors used in the prediction included demographic, financial, economic, psychological and situational aspects.

### **Self-Control, Personality Traits and Social Mood**

The results of both the Scottish Widows survey and the Stone and Maury study suggested that saving behaviour could be related to aspects of personality. Olson (2006) reported that the most prominent classification of personality types is the Five Factor Model. The five factors are extraversion versus introversion, agreeableness versus antagonism, conscientiousness versus heedlessness, emotional stability versus neuroticism, and openness-to-experience versus closed-to-experience. Some researchers have concluded that the five factors can be divided into two groups, thus making a two-factor model. Olson posited engagement and self-control as the two factors. Engagement encompasses extraversion and openness to experience, whereas self-control covers emotional stability, agreeableness and conscientiousness. Low scores on the self-control traits have been found to be associated with stealing, drug and alcohol abuse, absenteeism from work, bad behaviour towards other people, and poor handling of stress. Research has found that deficiencies in self-control are linked to addiction, crime, domestic violence, bankruptcy and academic failure; and negative emotions appear to impair self-control (Tice, Bratslavsky and Baumeister, 2001). The characteristics of low self-control people seem to be broadly consistent with the characteristics of non-savers identified in the Scottish Widows study.

Personality traits are not immutably fixed, and can be influenced by external factors. One such factor is social mood, which is mood that is pervasive within society. Prechter (1999) posited that, during periods of negative social mood, people are more likely to display the characteristics of low self-control. Negative social mood appears to be associated with distress, anxiety, antagonism, conflict, and reduced interest in work and achievement. For those who do save, social mood could influence the way in which the savings are invested. Negative social mood is likely to be associated with caution and risk-aversion, and hence the avoidance of stock market investments. Positive social mood is thought to engender engagement, including engagement with the high-return high-risk investments associated with stock markets.

Puri and Robinson (2007) found that people who exhibited optimism were more likely to save than pessimistic people, so long as the optimism was not extreme. Their research indicated that optimists saved more and exerted greater self-control. Moderately optimistic people appear to have a heightened appreciation of the future and hence are more inclined to save for the future. However extreme

optimism is associated with the feeling that the future will take care of itself ('something will turn up') and a low inclination to save.

### **Influences on Retirement Saving Behaviour**

Jacobs-Lawson and Hershey (2005) investigated psychological determinants of retirement saving behaviour. They found that the existence, and extent, of saving for retirement was related to three psychological characteristics. One of those characteristics is 'future time perspective', which is a measure of the extent to which people focus on the future (it is alternatively known as 'future orientation'). A number of studies (Burtless 1999, Hershey and Mowen 2000, Lusardi 1999) found that future time perspective is positively related to the tendency to save for retirement.

Another characteristic that Jacobs-Lawson and Hershey found to be related to saving for retirement was knowledge of financial planning for retirement. A number of studies have indicated that financial knowledge is positively related to levels of retirement saving (Ekerdt, Hackney, Kosloski and DeViney 2001; Grable and Lytton 1997; Hershey and Mowen 2000; Mitchell and Moore 1998; Yuh and DeVaney 1996). The third characteristic investigated by Jacobs-Lawson and Hershey was risk tolerance. Grable and Joo (1997), and Yuh and DeVaney (1996), found that risk tolerance was positively related to the level of retirement saving.

The findings of Jacobs-Lawson and Hershey were consistent with the results of previous studies in that higher levels of retirement saving were associated with greater degrees of future time perspective, knowledge of financial planning for retirement, and financial risk tolerance.

Harrison, Waite and White (2006) investigated attitudes to retirement saving by the use of focus groups. One finding was that positive or negative feelings about ageing and retirement have effects on saving. Some people dislike the thought of growing old whereas others relish the prospect of being free of the need to work. It is possible that the fear of old age is dealt with by putting the future out of mind, and that is likely to put preparation for the future out of mind. Those looking forward to retirement may be more inclined to prepare for it. Three other factors found to deter saving for retirement were (1) the

view that pension savings would be offset by reduced state benefits, (2) a mistrust of financial advisers, and (3) social pressures that encourage current spending.

Neukam and Hershey (2003) suggested that 'financial inhibition' and 'financial activation' were important determinants of retirement saving. Financial inhibition encompasses fear-based factors that deter saving. Such factors include the negative thoughts about growing old, as identified in the Harrison, Waite and White study. If old age is associated with images of poor health and faded looks, people may be reluctant to prepare for it. Thoughts of old age evoke feelings of fear and anxiety. Little thought is given to retirement since such thought has unpleasant connotations. Financial activation relates to goal-based motives that encourage saving. If old age were associated with leisure and freedom to choose how to use time, there would be a greater incentive to save for retirement.

Financial inhibition is fear-based and financial activation is goal-based. They are two distinct characteristics rather than two ends of the same dimension. Neukam and Hershey found that that the people who saved most were those with the strongest financial goals and the lowest level of fear. The goals and fears were not only related to visions of old age, but also to the planning process. The personal characteristics interact. For example a strong drive towards saving (planning) for retirement could be offset by a high level of fear about the planning process; a strong desire to accumulate wealth for retirement could be offset by a fear of stock market risk or a distrust of the financial services industry. This latter point is close to the Harrison, Waite and White observation that mistrust of financial advisers can deter retirement saving. The importance of fears concerning the saving (retirement planning) process relates to the Jacobs-Lawson and Hershey findings that financial knowledge and risk tolerance are positively related to retirement saving.

### **Automatic Enrolment in Pension Schemes**

Information overload can deter retirement saving (Turner 2006). If the choice between investment alternatives is too large and too complex, many employees take a default option. The default option may be to do nothing. The default option of non-participation might be taken even when the choice seems very simple; Benartzi and Thaler (2007) cite evidence from the UK that in occupational pension schemes where the employees are not even required to make contributions, only about half of them join

(the decision as to whether or not to accept a free pension would seem to be a very simple one). One remedy is to provide default options other than non-participation. Automatic enrolment in pension schemes (with the right to withdraw) makes the default option one of participation. This is likely to bring into a pension scheme both those who wish to save but fail to take action, and those who give little or no thought to financial matters. Another dimension of positive default options is to have a default fund that would be suitable for the average employee. A suitable contribution rate might be provided as the default rate, perhaps with an element of automatic escalation over time. Alternatives to the default options could be provided for the employees who wish to exercise choice. Turner (2004) reported that in Sweden's mandatory scheme 82% of new entrants allowed their entire contributions to be paid into the default fund whilst more than 600 other funds were available. Mitchell and Utkus (2006) provide evidence that pension fund participants like to be at the average and like to avoid extremes when making choices. This is consistent with the observation that plan participants tend to accept default options, which may be seen as the average (middle-of-the-road) options.

Akerlof (1991) concluded that most people succumb to the desire of current expenditure during their peak earning years and delay saving for retirement. Pension plan administrators often find that the most difficult step is to get people to start contributing. People tend to procrastinate. In the UK, the government is considering a change in company pension regulations so that employees join pension schemes automatically. The decision of the employee is thus one of whether to leave the scheme rather than one of whether to join. Procrastination would leave employees in the pension scheme. Madrian and Shea (2000) concluded that automatic enrolment plans are successful in increasing participation rates. In studying a plan that was changed to automatic enrolment, they found an increase in the participation rate from 49% to 86%. However most participants chose the minimum contribution level; the analysis of Madrian and Shea indicated that many participants would have chosen a higher contribution rate if they had explicitly chosen to opt into the scheme. Choi, Laibson, Madrian and Metrick (2001) found that people who would otherwise have contributed more into a pension scheme accept the default contribution rate when enrolment is automatic. So whilst automatic enrolment increases the number of members, those who would have joined anyway contribute less than they would have done in the absence of automatic enrolment.

The temptation to spend immediately is also reflected in choices made at retirement. When there is an option to take a lump sum in the place of part (or all) of the pension, people tend to choose the lump sum. This would be reinforced by the fear of dying soon after retirement with the effect that the money spent on an annuity would be lost. An annuity is an income for life that is purchased with a pension fund. Annuities provide insurance against longevity risk, which is the risk that someone could outlive their money. Longevity risk is the risk that a person's money is fully spent before death so that the person has no money during the later years of life. An annuity could be the default option at retirement.

### **Save More Tomorrow (SMarT)**

Benartzi and Thaler (2004) used the principles of behavioural finance to develop a practical programme for increasing the level of saving into pension schemes. The programme is called Save More Tomorrow (SMarT). The programme was designed to help employees who want to save more for retirement but find that their willpower is lacking.

One feature of SMarT is that there is a time lag between commitment to the scheme and the date on which payments begin. This overcomes the problem that people tend to value immediate money very highly (sometimes called hyperbolic discounting). People find it easier to commit to a future investment than an immediate one.

A second feature is that increases in payments to the scheme coincide with pay rises. By using part of a pay rise, contributors do not feel that they are reducing their disposable income (take-home pay). This avoids the aversion to loss identified by prospect theory. It does not seem to matter whether the pay rise is a real one, or simply matches inflation, since people seem to suffer from money illusion. The real rise is the increase in the purchasing power of the wage; if prices are rising, the real rise is less than the rise in money terms. Money illusion causes people to see money rises as real ones. Evidence for money illusion has been found by Kahneman, Knetsch and Thaler (1986) and by Shafir, Diamond and Tversky (1997).

A third feature is that the contributions to the pension scheme increase every time there is a pay rise, until a predetermined maximum proportion of income is reached. The status quo bias indicates that,

when faced with a choice, people tend to do nothing (i.e. they maintain the status quo). This causes procrastination. If the decision has already been made to increase contributions to the scheme, maintenance of the status quo entails proceeding with the existing arrangement to increase contributions.

A fourth feature is that employees can opt out of the plan if they wish to. This makes commitment to the scheme less binding, and hence makes the commitment more likely. The status quo bias tends to keep people in the scheme.

Benartzi and Thaler applied SMarT in a company and found that it was successful in raising rates of saving into a pension fund. They found that the average saving rate for participants in the programme increased from 3.5% to 13.6% over 40 months. They also found that 78% of the employees joined the programme, and that 80% of the joiners were still in the scheme after 40 months.

Benartzi and Thaler estimated that implementation of SMarT throughout the United States could increase personal saving by \$125 billion per year. Investment of such additional sums in stock and bond markets would put substantial upward pressure on share prices and bond prices. Successful plans to increase saving into pension funds could cause large rises in share (and bond) prices. After all, share prices are determined by demand and supply. A large increase in demand would be expected to result in a considerable rise in prices. The new savers would be rewarded with capital gains, and that might further encourage saving. There could be positive feedback investing whereby rising share prices lead to increased investment, which in turn raises share prices (and hence investment). Behavioural biases would tend to reinforce this upward cycle (as described in the chapter on stock market bubbles and crashes).

### **Behavioural Perspectives on Annuity Purchase**

It is standard financial advice for retirees to purchase annuities. The main argument in favour of annuity purchase is that it provides insurance against outliving the person's assets. If the alternative is seen as steadily drawing on assets during retirement, that alternative entails the risk that the person will

outlive the assets so that in advanced old age the person has no means of support other than state benefits.

One way of avoiding outliving one's assets would be to always budget for remaining life. In other words the retiree may withdraw decreasing amounts from the retirement fund in order to ensure that something always remains for future years. This has two disadvantages relative to annuity purchase. First the retiree could face a declining standard of living as the sums withdrawn decline over time. Second some money will remain unspent at death, so the retiree would not have been able to fully use accumulated assets to finance expenditure during retirement.

So it is to be expected that buying an annuity at retirement would provide insurance against outliving one's assets, could prevent a decline in the standard of living, and would ensure that people on average fully utilise their assets for financing retirement spending. Nonetheless people are often reluctant to buy annuities at retirement, and behavioural finance indicates some reasons for this (Hu and Scott 2007).

One issue is that many people see annuities as sources of risk rather than as means of insurance (Brown and Warshawsky 2004). Annuities are often seen as gambles on longevity. If the person dies early there is a loss since the accumulated receipts are less than the sum paid for the annuity. If someone sees an annuity as a source of risk then, even when the actuarial expectation is that receipts equal payments, a risk-averse person will refuse to buy an annuity. If an annuity were seen as insurance against outliving assets, so that the annuity is seen as reducing risk, a risk-averse person would buy an annuity.

Prospect theory indicates that losses are weighted more than twice as heavily as gains. This loss aversion suggests that the prospective loss from dying early is weighted more heavily than the potential gain from living longer than average. The substitution of statistical probabilities by decision weights, according to prospect theory, entails an exaggeration of small probabilities. In consequence the small probability of dying soon after retirement becomes exaggerated, thereby further disinclining people from annuity purchase.

Vividness also plays a part. The possibility of early death has greater vividness than the distant prospect of outliving assets, and is therefore likely to have a greater impact on decision making. There is also the possibility that people add together the chances of early death from various different causes, ignoring the fact that one would preclude the others (Hu and Scott see this as a manifestation of the conjunction fallacy).

Hyperbolic discounting, which leads to the present having a disproportionate weighting in decisions relative to later periods, may also have a role in deterring people from buying annuities. The purchase of an annuity entails giving up a sum of money in the present for a stream of cash payments stretching into the distant future. The endowment effect might provide part of the explanation for the unpopularity of annuities. According to the endowment effect people identify with their existing possessions, such that their existing possessions are seen as part of their concepts of self. People sometimes say that they are 'worth' a particular sum of money, meaning that they own such a sum. They may feel that the ownership of the wealth adds to their status and it may give them a feeling of self-respect. Buying an annuity entails loss of the money.

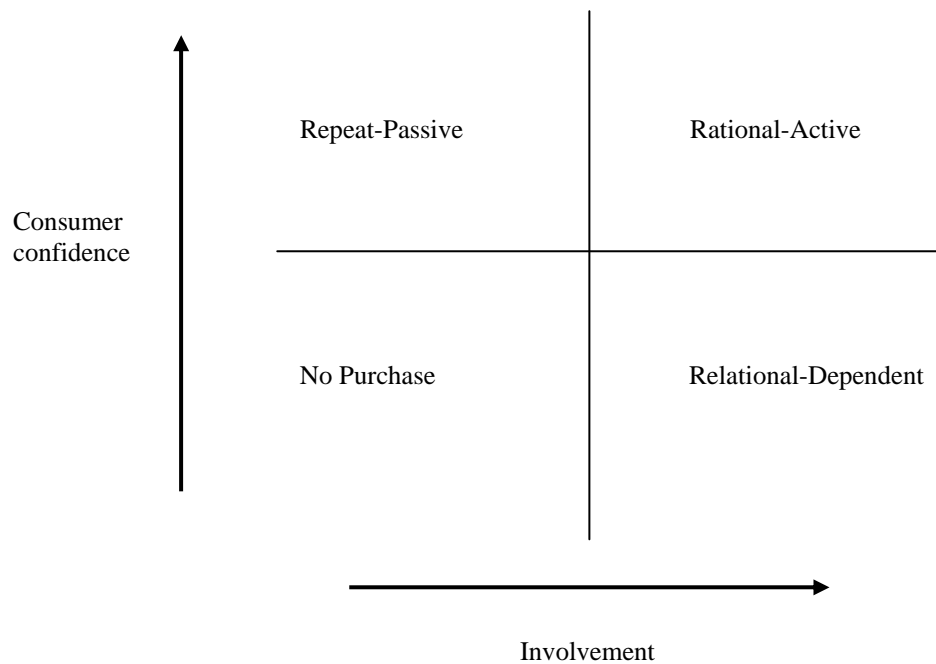
Notwithstanding these points indicating that the reluctance to buy annuities may be driven by irrational psychological biases, it is necessary to point out two clearly rational reasons. One is the loss of liquidity. If one's life savings are used up in the purchase of an annuity, the ability to meet an unexpected large expenditure (e.g. major house repairs) is lost. The second is the loss of the facility of making a bequest, for example leaving money for one's children in a will. However these are probably arguments for not using all of one's assets for the purchase of an annuity, rather than for not buying an annuity at all.

### **Classifying Investors**

Many of the predictions of behavioural finance are mutually inconsistent. Some behavioural biases predict overreaction whilst others predict under-reaction, some indicate underestimation of risk whereas others suggest overestimation, and some lead to excessive trading whilst others entail inertia. Other opposing predictions can be deduced from the principles of behavioural finance. Behavioural biases cannot apply equally to all investors. People differ in their susceptibility to particular

psychological biases. Different biases impact different investors to varying extents. The question arises as whether people can be categorised in terms of which behavioural biases are most influential in their decision-making.

Categorisations of savers and investors have been proposed by Beckett, Hewer, and Howcroft (2000) and by Keller and Siegrist (2006). The Beckett, Hewer and Howcroft classification is shown in Table 2.3.



**Table 2.3**

The term 'Consumer confidence' covers a number of attributes: uncertainty, perception of risk, complexity and knowledge. The term 'Involvement' encompasses control, participation and contact.

The 'No Purchase' group makes no investment. This group is characterised by low confidence and low involvement. The group includes people who leave large sums of money on deposit rather than investing more profitably. A survey by the Financial Services Authority (2000) found that many people said that they were confused by financial services products. The same survey found that only about 10% of respondents said that they would like more information about financial services products. The

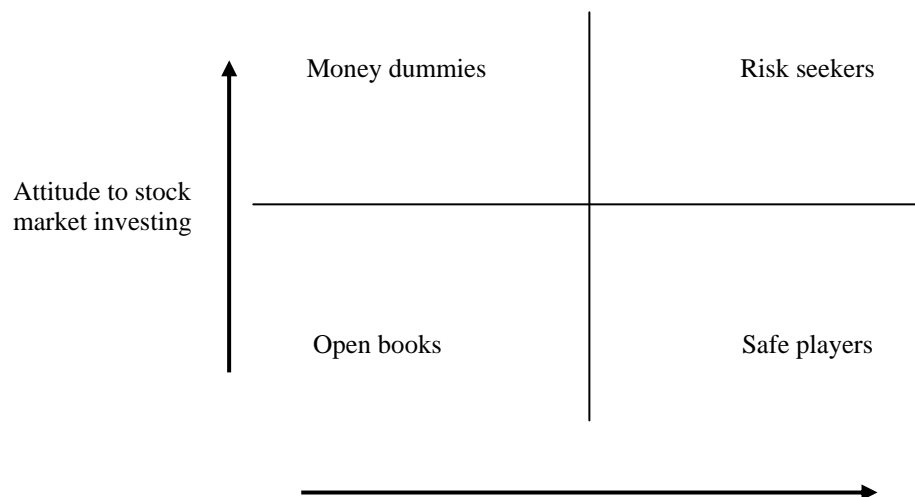
general apathy towards financial services was also found in a survey by the Association of Unit Trust and Investment Funds (2000), which discovered that about two-thirds of the people surveyed were not interested in learning about financial subjects.

The 'Repeat-Passive' group takes little interest in the investment process (has low involvement) but has sufficient confidence to take some risk. This group persistently invests in the same shares or funds. Its members show loyalty to the particular shares or funds, which they repeatedly invest in.

The 'Rational-Active' group comes closest to the investors of conventional (non-behavioural) finance theory. This group demonstrates the inclination, and has sufficient confidence in its ability, to actively choose between investments. These investors are willing to accept risk and to exercise control over their own investments. Byrne (2005), when researching the behaviour of retail consumers of institutional investments, found that direct customers had significantly higher expertise than other customers. Direct customers are those who buy direct rather than through the intermediation of a financial adviser.

The 'Relational-Dependent' group contains the investors who seek professional advice. They take an interest in the investment process but do not have sufficient confidence, in their ability to understand investment choices, to make their own evaluations of the alternatives.

The Keller and Siegrist classification is shown in table 2.4.



## Importance of money

**Table 2.4**

Keller and Siegrist make the (often overlooked) point that many people are not interested in saving, investing and wealth accumulation. Money is not very important to members of the 'Money dummies' and 'Open books' clusters. Possessing money and increasing wealth are not important goals for them. They show low interest and involvement in matters of personal finance. However 'Money dummies' are more favourably disposed towards stock market investing than 'Open books' (partly because 'Open books' tend to see stock market investing as immoral).

The investment of money is important to members of the 'Risk seekers' and 'Safe players' clusters. Possessing money and increasing wealth are important goals for them. They are more inclined to save than the 'Money dummies' and 'Open books'. They differ in their attitudes to stock market investing. 'Safe players' are more likely to keep their money on deposit rather than investing in stocks. 'Risk seekers' are more favourably disposed towards stock market investments and are relatively tolerant of risk. They are more confident about managing money than the other groups.

Tables 3 and 4 have been intentionally drawn to show parallels between the two classifications. Although the correspondence is far from perfect, there is a degree of correspondence between the quadrants in the two tables ('Repeat-Passive' with 'Money dummies'; 'No Purchase' with 'Open books'; 'Rational-Active' with 'Risk-seekers'; 'Relational-Dependent' with 'Safe players'.)

Possibly the weakest correspondence is between 'Relational-Dependent' and 'Safe players'. Both groups are concerned with saving and investing. However, with regard to stock market investments, the 'Relational-Dependent' group are probably more concerned with the complexity of the choices such that they seek professional advice. The 'Safe players' have a tendency to avoid stock market investment because it is seen as immoral. It is possible that this apparent difference between the groups arises from the Keller and Siegrist questionnaire, which asked about attitudes to the morality of stock market investing rather than its complexity or risk. A link between the 'Relational-Dependent' and 'Safe Players' groups could be (tentatively) established by reference to the ideas of Sjöberg (2000).

Sjöberg linked risk perception to attitude, e.g. opponents of nuclear power are inclined to see nuclear power as risky. The attitude helps to determine the perception of risk. So people who see stock market investment as immoral might also be inclined to see it as risky and complex.

It is not difficult to assign behavioural biases to the four quadrants. Investors in the top left hand quadrant are more likely to exhibit conservatism, status quo bias and familiarity bias. The bottom left hand quadrant would tend to contain the non-savers and procrastinators. The top right quadrant would be expected to contain the investors with a tendency towards overconfidence. The bottom right quadrant could contain a significant proportion of the investors for whom the complexity of choice is a problem.

The more loss-averse investors are probably in the bottom quadrants. Investors in the lower quadrants may be subject to biases that cause exaggerated perceptions of risk, such as the retrievability (availability) bias and the narrow framing that leads to excessive focus on short-term volatility.

An understanding of how different people think about saving and investment is important to policy-makers seeking to encourage saving for retirement and to financial institutions wanting to market their own investment products.

### **The Need for Targeted Marketing**

Lee (2002) took the view that there should be different approaches to marketing financial services, dependent upon the characteristics of the consumer group being targeted. Using cluster analysis consumers of financial services were divided into four groups. The four groups were named “open to direct means”, “cherry pickers”, “needs human touch” and “undecided”. Their relative levels of affluence followed that order.

The “open to direct means” cluster did not need contact with advisers when deciding upon the purchase of financial services. They preferred to arrange financial services via the internet, telephone or post. This group was the most affluent, the most highly educated, the youngest, and the most knowledgeable about financial services.

The “cherry pickers” were prepared to use direct means to arrange some financial services, such as credit cards and insurance, but preferred human contact for other services, such as mortgages and investments. This was the second most affluent group, and tended to be middle-aged. They had a reasonably good level of education, but not as much as the “open to direct means” cluster.

The “needs human touch” group strongly preferred face-to-face interaction. They were relatively poorly organised with respect to financial management. The “undecided” group expressed no preference between direct and human contact delivery of financial services. It was the least affluent cluster, and contained relatively older members. They were relatively poorly organised in respect to financial management, and often expressed budgeting difficulties.

It appears that it is not just the nature of financial products that needs to be varied according to the characteristics of the targeted groups, but the means of marketing and delivering the products also need to be varied. Some groups require more personal input than others. Human contact is a more expensive form of marketing and sales than direct means such as websites, telemarketing, and post. Unfortunately it seems that the consumers who require the most expensive delivery are the consumers whose relative lack of affluence makes them the least attractive to the providers of financial services.

There is evidence that marketing effort should be influenced by economic factors as well as by the characteristics of targeted groups. Tang, Thomas, Thomas and Bozzetto (2007) found that the effects of changes in economic and stock market conditions differed according to the socio-demographic characteristics of the consumers. A rise in unemployment is associated with reduced demand for financial products but the rich and the over 55s are less affected than other groups. Rises in inflation have a negative effect on purchases of savings products but affect older people less than younger people. Conversely the negative effect of stock market falls is greatest for the over 55s.

### **The Possibility of Misleading Marketing**

Investors should not only be aware of their psychological biases, but they should also be aware of how marketing can be misleading. Capon, Fitzsimmons, and Prince (1996) found that the main factor in the decision of which fund to choose was the fund performance in the recent past. Zweig (2000) observed

that fund managers took advantage of this by timing their advertising to coincide with relatively good performance of their funds. Investment companies typically operate a family of funds. The better performing funds from the family can be advertised, and the company as a whole thereby appears in a favourable light. The time period over which the advertised performance is measured could also be chosen with a view to achieving the most favourable presentation of a fund.

Huhmann and Bhattacharyya (2005) found that most mutual fund (unit trust) advertisements did not provide the information necessary for informed choices. Advertisers were found to use techniques that increase the likelihood that the advertisements are noticed but decrease the likelihood that they are read. The advertisements were concerned with conveying perceptions of success regardless of the accuracy of those perceptions.

Although there are publications that show performance figures for all funds in a company's range over standard time periods (e.g. 'Money Management' and 'Money Observer' in the UK), there are still ways in which investment companies can legally manipulate information. One possibility is 'burying the dead'. This entails merging poorly performing funds into stronger ones. Suppose that a company has a 'UK Special Situations' fund that has performed poorly over a number of years. Also suppose that the company has a 'UK Growth' fund that has performed well. If the company merges the special situations fund into the growth fund, the poorly performing fund disappears from the performance figures leaving only the strong fund. Investors in the special situations fund would have suffered poor performance but no current performance figures would reveal that.

Jordan and Kaas (2002) investigated the potential of using behavioural finance biases in the construction of advertisements. They found that the anchoring bias could be used to influence expectations of fund returns. The inclusion of a high percentage in the advertisement, even if the percentage is not related to investment returns, will raise the consumers' expectations of fund return. They found that the representativeness bias could be used. Representativeness entails the use of stereotypes, and if the investment company is reputable and well known it conforms to a positive stereotype. Funds managed by the company are seen as representative of the company. Jordan and Kaas found that funds managed by reputable, well-known, investment companies were seen as

relatively less risky. They also investigated the affect heuristic, which is the effect of positive feelings towards a product. They found that, if advertising could engender positive emotions associated with a fund, the fund would be seen as relatively less risky. It was found that advertising could be effective, in using the behavioural biases, on both knowledgeable and naïve investors. The effects were greater in the case of naïve investors.

### **Maximin and Minimax**

The measurement of risk by means of the standard deviation of a normal distribution of possible outcomes assumes a symmetrical attitude to risk. A 50% probability of loss is seen as fully compensated by a 50% probability of gain. Prospect theory suggests that this is not so, and that the trauma of loss is greater than the pleasure of profit. In the presence of such loss aversion, standard deviation may not be the most appropriate measure of risk. Maximin and minimax provide alternative measures of risk.

The maximin approach to decision-making seeks to obtain the highest minimum value ('maximin' comes from the 'maximum minimum' value). Someone using such a decision-making criterion may choose to measure risk in terms of the maximum loss.

The minimax regret criterion seeks to minimise opportunity cost and implies that risk should be measured as the maximum opportunity loss. Consider an investor who needs to choose between investing wholly in deposits, an equal combination of deposits and shares, and wholly in shares. Suppose that there are three possible outcomes: a 20% rise in share prices, stable share prices, and a 20% fall in share prices. Table 2.5 depicts the outcomes from an investment of £100 for each of the three share price scenarios. The opportunity loss relative to the most successful strategy, for each share price scenario, is shown in brackets.

	<b><u>100% shares</u></b>	<b><u>50% shares</u></b>	<b><u>0% shares</u></b>
20% rise	120 (0)	110 (10)	100 (20)

no change	100 (0)	100 (0)	100 (0)
20% fall	80 (20)	90 (10)	100 (0)

**Table 2.5**

The minimax regret criterion suggests the investment strategy that has the lowest maximum opportunity loss. In the case of table 2.5, it suggests an even split between shares and deposits. Risk is being measured as the maximum opportunity loss (10 in the case of the chosen strategy, 20 in the cases of the other two strategies). This approach is concerned with minimising regret ('minimax' regret comes from the 'minimum maximum' regret).

### **Conclusion**

Personal investment decisions are choices made under constraint. An obvious constraint is the amount of money available for investment; which is affected by wealth, income, debts, and personal (including family) commitments. Another constraint is limited knowledge of the investment options. Investment objectives include growth, income, low risk and liquidity (liquidity is the ability to turn the investment into cash quickly and cheaply). These objectives may entail trade-offs; for example high prospective growth may involve high risk.

Risk is not a simple characteristic. There are many types of risk. Some investments that are commonly seen as risk-free do carry risks. For example, building society and bank accounts are typically subject to the risk that interest rates might fall or that inflation would reduce the purchasing power of the invested money. Some risks are not obvious. For example there is the risk that an investment manager may perform relatively badly; this is known as management risk and provides a reason for choosing index-tracker funds that simply aim to follow a stock market index (such as the FTSE 100) without attempting to out-perform the stock market (see the chapter on mutual funds).

People may choose to retain, avoid, reduce or transfer risks. Diversification is a major way of reducing risk and entails holding a wide range of different investments in anticipation that losses on some would be offset by gains on others (see the chapter on portfolio diversification). In this context investors

should be aware that residential property, occupational pension rights, and human capital (earning power) are components of their wealth portfolios. Insurance transfers risks to an insurance company. Some institutional investments, such as stock market investments that guarantee that the capital cannot be lost, may use derivatives (particularly options) to insure the capital against loss (see the chapter on structured products).

Investors should be aware of their psychological biases when choosing investments. They should also be aware of how marketing can seek to exploit their psychological biases. There are psychological biases that entail self-deception. No-one is perfectly rational. Everyone has a tendency to see what they want to see, and remember what they want to remember. Self-image can affect perceptions of investment decisions, and the outcomes of those decisions, just as it affects perceptions of many aspects of people's lives.

People are bombarded with more information than the human mind can handle. This has implications for many decisions, including investment decisions. Mental shortcuts (rules-of-thumb), known as heuristic simplifications, are used. Everyone uses heuristic simplifications, even when they are unaware of them. People are often reluctant to accept that events occur by chance, and attempt to think of reasons and causes. People are often slow to change their opinions in the light of new evidence.

A person's ideas and behaviour are affected by the ideas and behaviour of others. There is a tendency to conform to the standards and opinions of people with whom we interact. There can be forms of 'groupthink' where all members of a group think and behave in similar ways. These social influences affect investment decisions as well as other decisions. Likewise moods and emotions affect investment decisions. Personality characteristics affect the level of saving, the types of investment into which the savings are put, and the willingness to sell or change those investments. People vary in terms of whether they are primarily concerned with the level of their wealth, changes in the level of their wealth, or avoiding the regret of making bad decisions.

**Further reading.**

Readers who would like to further pursue their studies of behavioural finance may find the following books interesting.

Montier, J. (2002), 'Behavioural Finance'. Wiley.

Montier, J. (2007). 'Behavioural Investing: A Practitioner's Guide to Applying Behavioural Finance', Wiley.

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