Investor behaviour in theory and practice

The aftermath of the financial crisis was marked by sharp volatility in the financial markets, with investors suffering, in some cases, significant financial losses. This affected not only individual financial products, such as Lehman Brothers "certificates", but entire asset classes. Investors – particularly private investors – were extremely nervous in view of the losses they incurred and the emerging evidence of mispricing in the financial markets. Developments that had already started prior to the financial crisis likewise helped unsettle savers. For instance, innumerable innovative but often also very complex financial products have made investment an increasingly challenging endeavour. Investors can now choose from a multitude of derivative structures, which, at least in theory, allow improved risk diversification by expanding the investment universe. However, they frequently entail risks that are often difficult to identify and to quantify.

Phenomena such as nervous market participants or complex financial products or decisions are not fully addressed by classical finance theory, which assumes a completely rational agent (*homo economicus*). However, this simplification – though useful for constructing models – frequently fails to adequately describe and explain typical behaviour patterns for investment decisions, which often adversely affect portfolio returns. Yet by looking at behavioural approaches (behavioural finance), researchers can analyse capital market phenomena which classical finance theory cannot explain. These include the empirically well-documented lack of diversification in investors' portfolios as well as the frequently observed excessive trading by investors.

Moreover, findings from classical theory and observations by behavioural finance researchers both have normative implications for investment decisions. One area is portfolio structure. The investment axiom known from classical finance theory of sufficiently diversifying the portfolio is not fundamentally altered by the findings from behavioural finance research. On the other hand, there are certainly benefits in probing the motives for buying and selling securities. In this context it is worth asking whether or not outperforming the "average market player" over the long term is realistic. Active investment strategies appear to make sense only if the answer to this question is yes. Lastly, insufficient attention is often devoted to the decisive role of cost structures in the choice of investment instrument – to purchase securities directly or buy broadly diversified investment vehicles. Furthermore, normative implications from the findings of behavioural finance research are being incorporated into regulatory plans to improve investor protection.

Behavioural finance: an overview

Behavioural finance examines market players' behaviour patterns ...

The study of market participants' behaviour patterns has come to be known as "behavioural finance". The so-called "behavioural approach" sets out to describe events in the financial markets using behavioural assumptions that are as close to reality as possible.[1] In contrast to the efficient markets hypothesis of classical finance theory, behavioural finance explains price discovery in the financial markets as a function not only of economic factors but also of the interplay between economic, psychological and sociological factors.

... drawing inter alia on psychological insight

A fundamental element of behavioural finance which departs from classical theory (see box on page 45) is developing more realistic model premises.[2] Behavioural finance looks at the processes involved in selecting, absorbing and processing information that is relevant for decision-making and at how investors form expectations and make decisions. The behavioural approach draws specifically on knowledge from other areas of science, such as psychology.[3]

Behavioural finance ...

Unlike the typical investor in classical finance theory, the behavioural finance investor does not meet the extremely strict rationality assumptions of a *homo economicus*.[4] The behavioural finance approach recognises that individuals are not able to process information at the same time and often do not evaluate it systematically, either. They allow their decisions to be swayed by, for instance, irrelevant details, and often make their investment decisions with the help of rules of thumb. Furthermore, investors may act contrary to their actual – or assumed – preferences and are influenced by ethical or emotional considerations (such as fairness or status). Behavioural approaches thus drop the idea of a well-informed, entirely self-interested and fully rational *homo economicus*.

... allows for market inefficiencies

One important outcome of behavioural finance research is that market inefficiencies and stubborn price distortions can exist even in markets with rational agents. This "limits to arbitrage" argument[5] is at odds with traditional theory, which posits that prices can only temporarily deviate from the fundamental value of a good since, even if some investors do not act rationally, the (fully) rational investors will always rapidly restore the fair price through "arbitrage".[6] Various studies show, however, that market developments which cannot be explained by the fundamentals can have a significant and long-lived

1 See M Rabin (2002), A perspective on psychology and economics, in European Economic Review, pp 657-685.
2 See W F M De Bondt and R H Thaler (1995), Financial decision-making in markets and firms: a behavioral perspective, in R A Jarrow, V Maksimovic and W T Ziemba (eds), North-Holland Handbook in Operations Research and Management Science, pp 385-410.
3 See R Shiller (2001), Human behavior and the efficiency of the financial system, in J B Taylor and M Woodford (eds), Handbook of Macroeconomics, pp 1305-1340.
4 For more information on the term rationality, see N Barberis and R Thaler (2003), A survey of behavioral finance, in G M Constantinides, M Harris and R Stulz (eds), Handbook of the Economics of Finance, pp 1051-1123.
5 See N Barberis and R Thaler (2003), A survey of behavioral finance, loc cit.
6 Arbitrage denotes the practice of taking advantage of price differences in different markets to make a profit. Arbitrage transactions are riskless if an identical financial product is purchased and sold at the same time and there is no counterparty risk (such as credit risk on the part of the financial intermediary). In some cases, entering into contrary positions in (supposedly) similar financial products is also referred to as arbitrage. Such transactions are then by definition risky.

Classical finance theory, the efficient markets hypothesis and the concept of the discerning and responsible investor

Rational investors represent the main cornerstone of classical finance theory. They are considered to form expectations and take decisions in a strictly rational way. That means that they will choose the option that maximises their personal benefit. In terms of model theory, they will maximise expected utility. The *homo economicus* defined in this way has a clear, complete and consistent order of preferences, knows the entire set of options and is able, considering all information, to assess to what degree each option will help him achieve his objective. Moreover, the theory postulates that investors are able reliably to quantify the risks they have entered into and to take full account of transaction costs. Ultimately, all market players have a "correct" and therefore identical decision-making model under this framework. In these simple models, access to information is considered to be free and unlimited.

Fama (1970) links the theory of rational expectations with the assumption of informationally efficient capital markets. Here, to varying degrees, prices directly, fully and correctly reflect any available information that is relevant for valuing an asset.[1] These markets exhibit no informational advantages that would allow an investor to achieve a higher return at the same level of risk in the long term (or a lower level of risk for the same return). As such markets incorporate all available information, the quoted price will theoretically always equate to the "fair" or fundamental value. This represents the present value of all future net cash flows that the investor can expect from ownership of the asset. Price fluctuations can therefore only be brought about by new information that no market player expects.

The assumption of rational investors and efficient markets is very ambitious and can, in reality, only ever be fulfilled approximately; nonetheless, it basically represents a suitable and common framework for financial market models. However, the recent financial crisis is just one of a number of events that have revealed the limitations of these models' explanatory power, as classical finance theory is unable, or only partially able, to explain financial market players' behaviour.

Nonetheless, regulatory considerations regarding financial consumer protection are often based on the concept, derived from classical finance theory, of the *homo economicus*.[2] Central to this concept is the overcoming of information asymmetries between suppliers and/or agents on the one hand and investors on the other. The objective is to strengthen consumers' position by improving the supply of information, enabling them to take considered investment decisions that match their goals and possibilities. This regulatory approach is characterised, in particular, by information and disclosure requirements vis-à-vis consumers for suppliers, such as the publication of prospectuses and product information as well as the disclosure of conflicts of interest. This approach is, in practice, complemented, amongst others, by measures to strengthen the enforceability of consumers' legal rights and market supervision of financial services providers.

1 Fama distinguishes between three forms of information efficiency. Under the strong form, the price fully and correctly reflects all information. The semi-strong form is present where the price reflects all publicly available information. The weak form is characterised by the fact that the price reflects only that information contained in historical securities prices. See E F Fama (1970), Efficient capital markets: a review of theory and empirical work, in Journal of Finance, Vol 25, pp 383-417. — **2** "Our model is the well-informed, discerning consumer who is able to act in a self-determined manner. With this objective in mind, we will increase consumers' quality of life through greater transparency, education, law enforcement and, where necessary, more rights." See coalition agreement between the CDU, CSU and FDP, 17th legislative period, 26 October 2009.

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impact on prices, which cannot be explained solely by transaction costs.[7] A lengthy period of securities undervaluation or overvaluation is possible, for instance, in markets in which "noise traders,"[8] as a group of non-fundamental investors, have driven an instrument's market price so far from its fair value that even rational agents are unable to correct this mispricing in the short term. The decisive factor is that no riskless arbitrage strategies exist in practice, which means that even fundamentally-oriented investors cannot maintain positions indefinitely and may therefore be compelled to realise losses.

Investor behaviour, explanatory approaches and normative implications

This section presents typical patterns of investor behaviour and the approaches used to explain them. It turns out that investors sometimes behave in ways that are detrimental to the returns on their portfolios.

Portfolios often insufficiently diversified

Investors' portfolios often comprise only a few asset classes, and within the various classes, wealth is often spread over a small number of securities.[9] As a consequence, many investors, by more broadly diversifying their assets, could reduce their risk without seeing average returns reduced over time.[10]

Ample evidence of portfolio underdiversification in Germany too

Portfolio underdiversification is an international phenomenon, of which ample evidence also exists for Germany. According to a survey conducted in 2006 by the German Socioeconomic Panel, some 46% of German households held only two to three different investment products. A further notable result is that around one household in five has just one investment product in its portfolio. The most popular investment forms are standard products such as savings books, life insurance policies or savings and loan contracts. By contrast, investing directly in shares or fixed-income securities frequently plays little or no role in wealth accumulation. According to this survey, over 70% of households held no shares and around 85% no bonds.[11] A survey by the Deutsches Aktieninstitut (DAI), a shareholder lobby association, on the number of investors who hold shares or mutual funds arrives at somewhat different figures to the German Socioeconomic Panel yet confirms the overall impression that shares are relatively unimportant as an investment vehicle for German investors.[12] According to its survey, in 2008 only around 8.6 million investors held

7 See J B DeLong, A Shleifer, L H Summers and R J Waldmann (1990), Noise Trader Risk in Financial Markets, in Journal of Political Economy, Vol 98, pp 703-738; A Shleifer and R Vishny (1997), The limits of arbitrage, in Journal of Finance, Vol 52, pp 35-55; A Subrahmanyam (2007): Behavioral Finance: A Review and Synthesis, in European Financial Management, Vol 14, pp 12-29.
8 Noise traders are investors whose investment decisions are not based on fundamentals. Black distinguishes between noise and "news", or information, with only the latter having any bearing on the company's fundamental value. See F Black (1986), Noise, in Journal of Finance, Vol 41, pp 529-543.
9 See eg M Blume and I Friend (1975), The asset structure of individual portfolios and some implications for utility theory, in Journal of Finance, Vol 55, pp 585-603. More recent data for the USA are contained in eg J C Campbell (2006), Household Finance, in Journal of Finance, Vol 61, pp 1553-1604; for Germany, see N Barasinska, D Schäfer and A Stephan (2008), Financial Risk Aversion and Household Asset Diversification, DIW Discussion Papers No 807.
10 Alternatively, by diversifying their assets more broadly, investors could increase their average returns without having to take greater risks.
11 See N Barasinska, D Schäfer and A Stephan (2008), Financial Risk Aversion and Household Asset Diversification, loc cit.
12 See Deutsches Aktieninstitut e.V. (2010), Aktienanlage: Soziale Schere öffnet sich, DAI-Kurzstudie 2/2010.

shares or mutual funds, with the figure trending downwards. That represented 13.3% of the population. An evaluation of Bundesbank data on the financial wealth of households (and non-profit institutions serving households) in 2009 yields similar results.[13] According to this, only 3.9% of wealth is held directly in shares (however, the trend is slightly positive).[14]

Investors tend towards "naïve" diversification ...

Investors often spread their wealth not just across a limited number of asset classes, they do not behave (fully) rationally when spreading their wealth among the various asset categories either. For instance, they frequently tend towards "naïve" diversification.[15] This is when portfolio composition is not based on fully rational considerations but is more or less arbitrary – such as by using rules of thumb ("heuristics"[16]). A rule of thumb on which investment decisions are often based is the so-called "1/n" heuristics.[17] Agents investing according to this method allocate their assets equally across those asset classes or securities with which they are familiar or of which they are aware at the time of their investment decision. One graphic example can be observed in the United States. There, employers frequently offer their employees mutual fund investment plans to save for retirement. The firm preselects various mutual funds, from which the employer can then choose. The preselection is found to have a significant influence on what funds investors actually choose[18] since their investment decisions often "mimic" the firm's preselection. Whereas, for instance, employees offered four share-based funds and only one bond-based fund invested an average of 75% of their money in shares, those offered one share-based fund and four bond-based funds – the exact reverse – invested an average of only 34% of their money in share-based funds.[19]

... and display home bias

Another reason why many portfolios are not very highly diversified is that they are excessively focused on their home market (home bias) – in other words, a disproportionately large percentage of securities in many investors' portfolios are domestic. Although capital market liberalisation and the introduction of the single currency in Europe have sharply reduced the home bias, domestic investment vehicles remain distinctly overrepresented. For equities in nearly all euro-area countries, the average percentage share of investment in the domestic market dropped significantly from 84% to around 59% between 1991

13 See Deutsche Bundesbank, Financial Accounts for Germany 1991 to 2009, Special Statistical Publication 4, June 2010.
14 Moreover, 11.9% of assets were invested in mutual funds which, in turn, were partly invested in shares.
15 See eg S Benartzi and R H Thaler (2001), Naive diversification strategies in defined contribution saving plans, in American Economic Review, Vol 91, pp 79-98.
16 For more in-depth information on the role of heuristics see eg R Shiller (2001), Human behavior and the efficiency of the financial system, in J B Taylor and M Woodford (eds), Handbook of Macroeconomics, pp 1305-1340, and S Benartzi and R H Thaler (2002), How much is investor autonomy worth?, in Journal of Finance, Vol 57, pp 1593-1616.
17 n denotes the number of investment options. Were the investment universe of an investor composed, for instance, of "shares" and "bonds", n would equal 2. People investing their assets according to 1/n heuristics would place 50% (= ½) of their funds in shares and the other 50% in bonds.
18 This phenomenon is known as the "framing effect". It is present if how a decision is framed influences people's behaviour in a predictable manner. See A Tversky and D Kahneman (1981), The Framing of Decisions and the Psychology of Choice, in Science, New Series, pp 453-458.
19 See S Benartzi and R H Thaler (2001), Naive diversification strategies in defined contribution saving plans, loc cit.

and 2007. For debt securities, the bias towards domestic paper also decreased, from 91% to 58%.[20]

The main reason given for the home bias is that the transaction and information costs of investing in foreign instruments are usually higher. However, transaction costs alone are generally not enough to explain the overwhelming preference for domestic securities. Although investors often do not have better information on their home market, they still appear to feel more capable of assessing domestic economic developments.[21] However, the preference for domestic paper should not always be regarded as irrational: for instance, the legal framework still varies from country to country, in some cases considerably. As a case in point, the settlement of cross-border depositor compensation claims revealed regulatory gaps.

Investors trade excessively ...

In addition, empirical observations indicate that the higher transaction costs generated by frequent trading are, on average, not offset by higher returns.[22] This phenomenon, also seen frequently among private investors, can be associated with individuals' tendency to overestimate their own possibilities and abilities – including their ability to make sound predictions. Overconfidence is an emotional factor which, according to psychological research, affects expectation formation.[23] One manifestation of it is that people, when making forecasts, frequently underestimate the degree of uncertainty.

In the real world, much trading seems to be motivated by different interpretations of what is often the same information.[24] In this context, therefore, overconfidence is a major factor in explaining excessive trading – in terms of the returns generated after deducting trading costs – and the pursuit of active trading strategies.

... and trade asymmetrically (disposition effect)

The phenomenon of investors tending to sell securities that have appreciated since they bought them ("winners") more quickly than those whose price has depreciated since their purchase ("losers") is called the disposition effect. Losers are thus held for a relatively long time, while winners are sold relatively quickly. What makes this noteworthy is that the purchase price – apart from tax considerations[25] – ought not to be a factor in the decision to sell; only the investor's assessment of the paper's future performance should matter.

20 See Deutsche Bundesbank, Monthly Report, December 2009, pp 37-39. The German home bias occupies a mid-table position among euro-area countries, though the decline is due chiefly to the increase in the importance of non-resident mutual funds.
21 See M Kilka (1998), Internationale Diversifikation von Aktienportfolios: Home Bias in Kurserwartungen und Präferenzen, Lang, Frankfurt am Main.
22 See B M Barber and T Odean (2000), Trading is Hazardous to Your Wealth: The Common Stock Performance of Individual Investors, in Journal of Finance, Vol 55, pp 773-806.
23 See B Fischhoff, P Slovic and S Lichtenstein (1977), Knowing With Certainty: The Appropriateness of Extreme Confidence, in Journal of Experimental Psychology: Human Perception and Performance, Vol 3, pp 552-564, and R Shiller (2001), Human behavior and the efficiency of the financial system, loc cit.
24 See W F M De Bondt and R H Thaler (1995), Financial decision-making in markets and firms: a behavioural perspective, loc cit.
25 The purchase price matters to some extent when taking an after-tax view, since the tax gain or loss is generally linked to the purchase price. It might therefore make sense, in some cases, for the investor to realise a price loss if it can be set off against taxable gains. However, this would imply behaviour that runs exactly counter to the disposition effect observed among investors.

Concepts such as prospect theory ...

Various approaches are used to explain the disposition effect.[26] One way of explaining it is, for instance, using what is called "prospect theory".[27] Prospect theory is based on a valuation function that measures the utility of an investment not in terms of its (expected) absolute value, as with a normal utility function, but in terms of price performance. It thus postulates an effect known as "anchoring".[28] Anchoring denotes the selection of what is essentially an arbitrary reference value – often the purchase price of a security. The choice of anchor influences the investor's perception, since whether an investment is seen as winning or losing depends on that anchor. Whereas individuals are risk averse when their shares are "winning" – as per standard utility functions – they are risk seekers when losing.[29] The disposition effect can be explained by the assumption that such a value function exists. Investors attribute less value to the possibility of further gains on securities[30] that are already "winning" relative to potential losses, leading them often to sell these winners relatively quickly.

... or regret avoidance help explain the disposition effect

Another avenue towards explaining the disposition effect is what is known as regret avoidance. This refers to the human tendency to seek to avoid negative emotions wherever possible. Accordingly, the typical investor is tempted to avoid the negative emotions associated with selling an equity investment at a loss by putting off the decision. The negative emotions are generated because the loss is realised upon sale and must then, if not beforehand, be "mentally accounted" for.[31] This behaviour, however, is not rational, as the purchase price is a wholly irrelevant reference price for future performance and the "damage" is already done, irrespective of whether the investor decides to sell or hold.

Herding can cause macroeconomic damage and can be explained by ...

On the financial markets, investors frequently mimic one another, behaviour which classical finance theory cannot explain. This is described as herding, or herding behaviour.[32] Herding can cause problems since it can make financial markets more volatile and feed speculative bubbles, such as the recently burst real-estate bubble in the United States. There are various approaches to explaining imitation, in which agents' behaviour can be

26 See eg H Shefrin and M Statman (1985), The disposition effect to sell winners too early and ride losers too long, in Journal of Finance, Vol 40, pp 777-790, and T Odean (1998), Are investors reluctant to realize their losses?, in Journal of Finance, Vol 53, pp 1775-1798.
27 See D Kahneman and A Tversky (1979), Prospect theory: an analysis of decision under risk, in Econometrica, Vol 47, pp 263-292. For more on the limitations of prospect theory as an explanation of the disposition effect see N Barberis and W Xiong (2009), What Drives the Disposition Effect? An Analysis of a Long-Standing Preference-Based Explanation, in Journal of Finance, Vol 64, pp 751-784, and T Hens and M Vlcek (2005), Does Prospect Theory Explain the Disposition Effect?, University of Zurich Working Paper No 262.
28 See eg A Tversky and D Kahneman (1974), Judgement under Uncertainty: Heuristics and Biases, in Science, New Series, pp 1124-1131.
29 Put simply: the pain of losing €200 is not twice as great as that of losing €100 but disproportionately less.
30 The disposition effect is frequently observed for shares but can also occur with other securities classes. For more on mutual funds and the disposition effect, see S Jank and M Wedow, Purchase and redemption decisions of mutual fund investors and the role of fund families, Deutsche Bundesbank Research Centre, Discussion paper, Series 2, No 03/2010.
31 For more on mental accounting see R H Thaler (1999), Mental Accounting Matters, in Journal of Behavioral Decision Making, Vol 12, pp 183-206.
32 There are also rational grounds for herd behaviour, however. If investors, for example, react similarly to new information and reassess their portfolios accordingly, this can lead to similar trading activity (spurious herding). Such behaviour is consistent with efficient markets as long as the new market prices reflect the new framework conditions.

individually rational but can collectively create inefficient solutions.[33]

... information cascades ...

Information cascades are one possible explanation for herding behaviour. Investors base their decisions on those of other market players, which they copy. In doing so, they follow other investors' decisions to buy or sell blindly, ie with no thought as to whether prices are fundamentally justified. If investors make the same investment one after the other, they can ratchet prices up. Price developments then no longer reflect new information in the strict sense but only some market players imitating the decision of others. For investors, imitation involves low information costs, but investment decisions are taken without a valuation of their own.

... and reputation-based behaviour

An additional approach assumes reputation-based herding, in which it may be rational for fund managers or analysts to follow the herd in their investments or forecasts. If price developments are negative, they do not have to fear any extraordinary loss of reputation as long as they do not significantly underperform their peers. In case of a misjudgement, a large number of other market participants will have made the same mistake.[34] Such individually rational behaviour can lead to market prices that are incompatible with the underlying fundamentals. Herding behaviour is also created automatically, as it were, by correlated inflows and outflows to funds. If market agents invest in such funds based on past performance, prices will rise without any fundamental justification.[35]

Investing mistakes can be avoided ...

The behaviour patterns described in the preceding sections impact directly on investors by possibly reducing their wealth and thus their consumption options. Investors are also indirectly affected by their behaviour and that of other market players since the phenomena described by behavioural finance can impair the proper functioning of the market mechanism and thus lead to misallocation of capital and instability. Phenomena such as herding behaviour are capable of making the financial system more volatile at macro level, potentially exacerbating crises. For instance, the bursting of resultant asset price bubbles can make it more difficult for the economies affected to return to a solid growth path. Since misallocation and instability are associated with welfare losses, greater prudence among market players could be expected to lead to a less crisis-prone financial system, higher growth rates and thus greater overall economic wealth.

However, individual investment mistakes can be reduced by acquiring the relevant financial knowledge, as financial education allows in-

33 See S Bikhchandani and S Sharma (2000), Herd Behavior in Financial Markets: A Review, IMF Working Paper 00/48.
34 See D Scharfstein and J Stein (1990), Herd Behavior and Investment, in American Economic Review, Vol 80, pp 465-479. This is confirmed empirically by H Hong, J Kubik and A Solomon (2000), Security Analysts' Career Concerns and Herding of Earning Forecasts, in Rand Journal of Economics, Vol 31, and J Chevalier and G Ellison (1999), Career Concerns of Mutual Fund Managers, in Quarterly Journal of Economics, Vol 114, pp 389-432.
35 See A Oehler and S Wendt (2008), Herdenverhalten in der Fonds-Industrie?, in A Oehler and U Terstege (eds): Finanzierung, Investition und Entwicklung, Einzelwirtschaftliche Analyse zur Bank- und Finanzwirtschaft, Springer, pp 64-83.

vestors to detect and avoid inefficiencies.[36] In the following, three issues which are at the heart of every investment decision will be discussed: the underlying portfolio structure, a review of the motivation to trade and thoughts on the cost structure.

... by drawing on findings from behavioural finance and classical finance

Both the findings of classical theory and observations from behavioural finance research are relevant for investors. Classical finance theory and behavioural finance take on different "roles". Whereas the positive (descriptive) behavioural finance shows what behaviour patterns investors tend to adopt, the normative (prescriptive) classical theory formulates an ideal or optimal behaviour or investment outcome.

Investors should diversify ...

Portfolio underdiversification is a widespread phenomenon among private investors and well-documented in behavioural finance research. Given the importance of asset composition for long-term investment success,[37] investors are well-advised to pay particular attention to portfolio structure (asset allocation).[38]

... because this improves the portfolio's risk profile

The recommendations on optimum asset allocation or portfolio diversification are derived largely from normative, ie prescriptive, classical theory. In keeping with the underlying tenets of Markowitz portfolio theory,[39] the investor must ensure that his portfolio includes a sufficient number of asset classes and securities with different risk profiles; provided the instruments in the basket of investments do not correlate perfectly, the fluctuations in the prices of individual securities will partly offset one another and thus dampen the portfolio's overall performance. On balance, the performance of the overall basket of investments will therefore be smoothed over time, and it will become possible to obtain, over time, higher average returns without changing the riskiness of the portfolio.[40]

Investors should continue to question their motives for trading ...

In the light of findings from behavioural finance research, investors should also always question their motives for buying and selling securities. For instance, many investors make the mistake of trading too much (excessive trading) or asymmetrically (disposition effect).

Investors should therefore be clear whether they wish to pursue an active or passive investment approach and ask themselves the

36 Studies have confirmed the intuitive relationship between a sound financial education and individual investment success. See eg J C Campbell (2006), Household Finance, in Journal of Finance, Vol 61, pp 1553-1604.
37 For instance, variation of yields can be explained in large part by strategic asset allocation. The effect of asset allocation on the variation in the success of investment is often around 90% in longitudinal comparisons (ie over time). See eg G P Brinson, L R Hood and G L Beebower (1986), Determinants of Portfolio Performance, in Financial Analysts Journal, pp 39-48, and D Blake, B N Lehmann and A Timmermann (1999), Asset Allocation Dynamics and Pension Fund Performance, in Journal of Business, Vol 72, pp 429-461. This approach is discussed in, for instance, R G Ibbotson (2010), The Importance of Asset Allocation, in Financial Analysts Journal, Vol 66, pp 1-3.
38 Private investors' asset planning is a process in which the individual's assets are "translated" into a customised strategic asset allocation taking into account investment goals, preferences and special circumstances.
39 See H Markowitz (1952), Portfolio selection, in Journal of Finance, Vol 7, pp 77-91.
40 The positive – ie descriptive – behavioural finance research provides reasons why investors do not diversify their portfolios sufficiently, in some cases. This does not affect the fundamental advantages of diversification, for the most part. However, behavioural finance also provides indications that assets could be more strongly correlated than suggested by classical finance theory. This would have to be taken into account when assembling the portfolio. On this, see N Barberis and R Thaler (2003), A survey of behavioral finance, loc cit.

Active and passive asset management

In asset management – whether at the individual level or, for instance, at investment fund level – there are two different investment approaches. The objective of so-called passive management is to track the targeted portfolio – for instance, a representative market index[1] – as closely as possible. By contrast, an active asset manager will try to outperform the benchmark portfolio, for example by overweighting (or underweighting) individual stocks or specific asset classes as compared to the benchmark portfolio because he or she believes that they will outperform (or underperform) the market – in other words, the relevant benchmark portfolio.

Active strategies may be successful if, for instance, mispricing is recognised as such. Behavioural finance studies show that examples of such market inefficiencies do indeed exist. However, the presence of inefficiencies in itself does not guarantee that they can be exploited profitably, as there is no riskless arbitrage (see the "limits to arbitrage" arguments set out on pages 44-46). Even correctly identified mispricing may result in losses if this deviation from fair value does not correct itself "automatically". In such a situation, even rational market players that recognise a market inefficiency and bet on its correction would lose out.

Moreover, active management is similar to a zero-sum game in that one investor's gain is another's loss.[2] That means that all investors' gains versus the benchmark portfolio will add up to zero – before factoring in the costs of active management. After costs, the total return on all active portfolios is therefore lower than that on the benchmark portfolio. Cost considerations are an important factor in active asset management mandates, as these tend to be associated with greater costs than passive mandates.[3]

In principle, retail investors could also decide to actively manage their wealth themselves. To be successful, they would have to be able systematically to identify and exploit market inefficiencies. This is very difficult as they would be competing with a large number of professional asset managers who themselves frequently have difficulty delivering the promised excess returns. Empirical studies, for instance, regularly confirm theoretical considerations that active mandates are, in the aggregate, unable to beat their benchmark index in the long run.[4] However, individual managers do outperform their benchmark portfolios year after year. Indeed, asset managers that have performed particularly well in the past frequently also achieve an exceptionally good result in the following year.[5] However, it is contentious to what degree this effect can be attributed solely to the competence of the asset manager.[6] Again, one may ask whether typical retail investors can identify successful asset managers and assess the odds of them repeating past successes.

1 Developments in a particular market or sector are frequently measured based on the performance of indices. A market index compresses the performance of a selection of securities into a single figure, the index level. A distinction is made between price and total return indices. While the former only reflect current prices, the latter include all cash flows. This might mean dividend payments for an equity index or coupon payments for a bond index. — **2** See W F Sharpe (1991), The Arithmetic of Active Management, in Financial Analysts Journal, Vol 47, pp 7-9. However, market players who pursue active approaches tend to increase liquidity on the relevant markets. All market players benefit from the lower transaction costs this causes. — **3** Active approaches are generally more resource-intensive than passive mandates, as resources are required for market analyses and the associated infrastructure, for instance. Active mandates therefore usually have higher management fees. — **4** See, for instance, R G Ibbotson and P D Kaplan (2000), Does Asset Allocation Policy Explain 40, 90, or 100 Percent of Performance?, in Financial Analysts Journal, Vol 56, pp 26-33; B G Malkiel (1995), Returns from Investing in Equity Mutual Funds 1971 to 1991, in Journal of Finance, Vol 50, pp 549-572, M C Jensen (1968), The performance of mutual funds in the period 1945-1964, in Journal of Finance, Vol 23, pp 389-416. — **5** See B G Malkiel (1995), Returns from Investing in Equity Mutual Funds 1971 to 1991, loc cit; M Grinblatt and S Titman (1992), The Persistence of Mutual Fund Performance, in Journal of Finance, Vol 47, pp 1977-1984, and W N Goetzmann and R G Ibbotson (1994), Do Winners Repeat? Patterns in Mutual Fund Behavior, in The Journal of Portfolio Management, Vol 20, pp 9-18. — **6** See S Phelps and L Detzel (1997), The nonpersistence of mutual fund performance, in Quarterly Journal of Business and Economics, Vol 36, pp 55-69.

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related question of whether such a strategy seems justified. Discussing the pros and cons of active and passive management is predicated on the fundamental question of whether it is possible to "beat the market in the long term" – and if so, what preconditions have to be met (see box on page 52).

... and act in a cost-sensitive manner ...

Investment success remains largely dependent on the associated costs. Nonetheless, investors often appear to fail to pay enough attention to the costs associated with investment decisions, as is evidenced by many investors' overtrading, for instance.[41] One source of costs is replicating the desired portfolio structure, ie purchasing individual securities (direct modelling)[42] or buying suitable investment products such as funds or "certificates"[43] (indirect modelling). Costs may, for instance, come in the form of purchasing and selling fees, load fees in the case of funds or the bid-ask spread.[44] Moreover, administrative fees and possibly performance-related remuneration might be payable. On the other hand, a generally broadly diversified portfolio can be achieved in a transactions cost-efficient manner – because it involves only one transaction – by purchasing an investment product which replicates a broadly diversified market index or which tries to beat it.[45]

... as this is key to the success of the investment

The administrative fee can vary strongly depending on the vehicle – active mandates tend to be more expensive than passive ones – and can have a significant impact on wealth in the longer term.

Behavioural finance and regulation

Although behavioural finance provides important ideas for lawmakers, ...

In principle, research findings in behavioural finance can provide important ideas for lawmakers on how to improve investor protection through suitable regulation. Findings from research on behavioural finance allow a better assessment of the behaviour patterns of economic agents and show potential reasons why actual behaviour in investment decisions differs from the idealised investor behaviour in classical finance theory. One possible conclusion could be that action is needed – such as promoting financial education. Another is that behavioural finance research could also have direct implications in terms of shaping prudential measures in that regulation is used to take advantage of market players' behavioural tendencies or to reduce or counteract behaviour patterns that society regards as undesirable. As a case in point, undesirable framing effects can be combated by influencing the method and

41 Other types of costs, such as administrative fees for mutual funds, are often neglected. See B M Barber, T Odean and L Zheng (1995), Out of Sight, Out of Mind: The Effects of Expenses on Mutual Fund Flows, in Journal of Business, Vol 78, pp 2095-2119.
42 The costs of direct modelling are largely dependent on investment style – implementing active strategies generally requires more transactions than passive strategies – and on the granularity (number of securities) in the target portfolio.
43 Mutual fund shares or certificates are bearer debt securities issued by banks, which are subject to issuer risk.
44 Implicit costs such as the market impact – a negative price development for the investor triggered by a large buy or sell order – also count as transaction costs. However, for private investors they are usually smaller than for institutional investors since the latter generally carry out larger orders.
45 In addition, the portfolio restructuring associated with an index adjustment is performed by the manager of the investment product. In some cases, purchasing a vehicle is also the only way to obtain access to a specific market.

form in which investors are supplied with information.[46]

... greater use in regulatory plans is still in its infancy

On the whole, however, increasing the use of behavioural finance in regulatory plans is still in its infancy. In particular, there are often no concrete and empirically robust recommendations on how to translate these insights into regulatory practice; further research is therefore necessary.[47] Nonetheless, insights gained from behavioural science are increasingly being taken into account in financial market regulation. In November 2010, the European Commission published the results of a study on the behaviour of investors in the retail segment along with relevant policy implications.[48] The study finds, for instance, that investors benefit from simplified and standardised product information.

Influence on regulatory plans already noticeable, however

The latest measures and current proposals to strengthen investor protection in Germany also reveal the influence of behavioural science in the financial markets. As a case in point, the Federal Government's draft legislation to protect investors and improve the functioning of the capital markets[49] currently under discussion provides for a standardised product information sheet in which product information is disclosed in a clear and concise form. The product information sheet is intended to inform investors about the type of product, how it works, its risks, the prospects for repayment and returns and the associated costs. The central feature is the materiality of the information; such sheets do not claim to be exhaustive, as is, for instance, characteristic of the comprehensive prospectus. This ties in with the finding from behavioural finance research that the method of presentation and the amount of information provided can significantly influence investors' perceptions. By tailoring the information to its target audience, the product information sheet is intended to reduce information asymmetries, taking into account limited rationality.[50]

Strengthening such regulatory efforts at investor level is an additional way of making the financial system as a whole and the macroeconomic framework more stable. These regulatory initiatives at the micro level of individual investors therefore complement the current raft of regulatory initiatives in banking supervision and financial market regulation that was inspired by the financial crisis.

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46 See OECD (2010), Consumer Policy Toolkit, p 45.
47 See L A Reisch and A Oehler (2009), Behavioral Economics: Eine neue Grundlage für die Verbraucherpolitik, in Zimmermann/Schäfer (2009): DIW Berlin, Vierteljahreshefte zur Wirtschaftsforschung 2009: Verbraucherpolitik zwischen Staat und Markt, p 40.
48 See N Chater, S Huck and R Inderst (2010), Consumer Decision-Making in Retail Investment Services: A Behavioural Economics Perspective, Final Report, 22 November 2010.
49 Federal Government draft Act on Improvements in Investor Protection and Capital Markets Functionality (Anlegerschutz- und Funktionsverbesserungsgesetz) of 22 September 2010.
50 A simplified product information sheet for funds open to the general public, known as the Key Investor Information (KII), has also been developed at European level and is also part of the German government's draft.