

# Psychology, Financial Decision Making, and Financial Crises

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## Summary

*It is understandable that people ask how the current financial crisis could happen. As the market actors appear irrational, it is also understandable that people—lay people and experts alike—believe that psychological factors play a decisive role. Is there evidence for such a role, and what is the evidence? This monograph reviews, evaluates, and discusses research—primarily psychological research—that can potentially increase our understanding of the psychological antecedents and consequences of financial crises. It also highlights important areas where more psychological research is needed to advance this understanding.*

*Individuals generally use their cognitive and other resources in sensible ways, and collectively they have developed procedures that effectively regulate economic and other social transactions. But sometimes such transactions are so complex that they exceed the ability of individuals or groups to manage effectively. It is therefore essential that scientific knowledge of people's cognitive and other limitations be brought to bear on the issue of how to improve decision making in these domains.*

*Financial markets such as those for stocks and credit arguably are among those domains in which actors' capacity to make rational judgments and decisions is frequently overtaxed. In product markets with full competition, prices more closely represent the true value of the products; uncertainty in such contexts is thus minimized and the conditions are relatively conducive for making good judgments. But in stock markets, stock prices, due to excessive trading, are more volatile than they would be if they reflected stocks' true value. Psychological explanations of excessive trading include cognitive biases such as overconfidence and overoptimism, risk aversion in the face of sure gains and risk taking and loss aversion in the face of possible losses, and influences of nominal representation (the money illusion) of stock prices. If no cognitive biases (strengthened by affective influences) existed or only some actors were susceptible to such biases, individual irrationality in stock markets would possibly be eliminated. But evidence shows such biases are in fact pervasive. In order to understand stock market booms and busts, it is also necessary to take into account the tendency among actors to imitate each other. Furthermore, in destabilized stock markets, experts are less likely to lose*

*money than are lay people, who lack skill in constructing stock portfolios that effectively diversify risk.*

*Credit markets allow people to lend money for investments that will pay off in the future. Yet under extreme circumstances, credit lenders offer loans without appropriately considering the risk borrowers run of not being able to pay their monthly installments. Global credit excesses in general, and the current subprime mortgage crisis in particular, also show that households often accept risky loans. Furthermore, their preparedness to use credit has been increasing and credit is no longer solely a means of investing in the personal future. An example is that, in the new member states of the European Union, citizens having a desire for a Western living standard are increasingly prepared to use credit.*

*Credit use is a process consisting of different stages of decision making, starting with purchasing a product for borrowed money and ending with paying back the borrowed money. Decisions to save now in order to buy a desired product in the future, or not to save but to borrow money and save later, are intertemporal choices with consequences at different points in time. The rewards of possessing a commodity immediately or in the future are traded off against the costs of paying back borrowed money in installments or paying the price all at once in the future.*

*Purchase decisions involve two interacting choices preceded by information search: Choice of the product and choice of the method of financing. Only a small percentage of credit users search extensively for credit information prior to taking up credit. The probability of search increases with the borrowed amount, the amount of previously experienced debts, higher income, and higher educational level, and it also is higher for credit novices. Furthermore, credit users fail to correctly anticipate the decrease in the experienced pleasure from the credit-financed product. They also experience decreasing pleasure with the acquired product and increasing strains from*

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the continuing payments. In order to deal with this hedonically unsatisfactory state, credit users are tempted to borrow again, and thus possibly slide into problem debt. There is also a reciprocal interaction between the pleasure derived from consumption and the pain associated with paying. As long as a purchased product is not fully paid, pleasure of consumption would be attenuated by painful thoughts about the remaining payments. Therefore, loan payments would become progressively less burdensome if the outstanding debt balance and the associated pain shrink more quickly than the benefits of consumption. If payment and consumption are mentally coupled, credit financing would only be accepted for long-lasting goods that slowly depreciate in value, so that the pain of paying is buffered by the benefits derived from the consumption of the product.

In coping with economic hardship caused by financial crises and economic recessions, households use a hierarchy of tactics for adjustment, including buying cheaper, buying less, buying higher quality (more enduring products), and buying fewer (or selling) durables. As the last implies lifestyle changes, it is a last resort, even though it would be the most effective way of coping. Younger people are more flexible than older people. Yet older people, who have experienced economic recessions before, are better able to cope than are younger people, who lack such experience. Pessimistic people and people in lower socioeconomic strata adjust by buying less, whereas optimistic people and people in higher socioeconomic strata continue their consumption and lifestyle by buying higher quality and enjoying more enduring products.

People should be taught budgeting and mental accounting techniques to become aware of the possibilities of curtailment by taking account of their spending on a variety of expense categories. The use of credit cards makes mental accounting more difficult and should therefore be discouraged. Implementation of countermeasures is however not easy. There are important differences between people when it comes to financial knowledge—differences related to age, gender, level of education, and occupation. Most people furthermore dislike to think about and to compare financial products. Many people even lack the motivation to acquire the knowledge of financial products and procedures that are needed to function in a complex financial world—a world in which people are increasingly responsible for themselves, as they must rely less on governmental regulations for protection and support.

A detrimental consequence of financial crises is the loss of trust in financial institutions. Seven determinants of trust (and of regaining trust) in financial institutions are discernible: competence, stability, integrity, benevolence, transparency, value congruence, and reputation. The first four are necessary preconditions or “dissatisfiers” that bring trust from negative to neutral. The last three are “satisfiers”; achieving some or all three would bring trust from neutral to positive.

Some argue that asset bubbles are started by greed fuelled by overconfidence and optimism (as well as low interest rates and inexpensive credit), “madness of crowds,” and self-fulfilling prophecies encouraging people to do things

they would not do otherwise. Asset bubbles are characterized by “momentum buying,” such that the real value of assets becomes irrelevant. One may ask how financial institutions can be changed to become more responsible. One way would be to incorporate long-term environmental, social, and corporate governance considerations in investment processes, to achieve both favorable financial outcomes and favorable social outcomes. This would require removing or changing the conventions that favor remuneration based on short-term performance. Making required cultural shifts is no easy matter. But no groups, financial institutions included, are entirely homogeneous; minorities of open-minded, socially responsible thinkers exist, and a crisis like the current one is perhaps when they are more likely to be listened to.

A policy-relevant insight is that whereas increasing material wealth in already affluent societies has small effects on citizens’ life satisfaction, shrinking material wealth in times of economic crises and recessions may have a more profound effect. In affluent societies, preventing shrinking material wealth should therefore have higher priority than increasing material wealth.

## Introduction

It is understandable that people want to know how the current financial crisis could have happened. Since the market actors appear irrational, it is understandable that people—lay people and experts alike—believe that psychological factors have played a decisive role (Akerlof & Shiller, 2009). The evidence in fact suggests that psychological factors always play a role in financial markets. However, psychological factors are not necessarily “irrational”; rather, they represent regularities in how people process information and act upon it. The contribution of psychology is to find these regularities in people’s perceptions and decisions—that is, their heuristics and biases—that account for their economic behavior.

The late Herbert Simon, a political scientist, professor of psychology at Carnegie-Mellon University, and the 1978 Nobel laureate in economics, argued that people are boundedly rational (Simon, 1956, 1982, 1990). They use their resources in sensible ways to adjust to the prevailing situational demands. But some situations exceed people’s capacity to judge probabilities and make good decisions. Many contemporary scholars in behavioral finance (e.g., Shefrin, 2000; Shleifer, 2000; Taleb, 2004) believe that in financial markets people are frequently not capable of acting rationally. The late Amos Tversky and Daniel Kahneman, another Nobel laureate in economics, have done more than any other scholars in psychology to show this empirically (Kahneman, 2003a, 2003b; Laibson & Zeckhauser, 1998).

The aim of the present monograph is to review, evaluate, and discuss research, primarily psychological research, that may increase our understanding of the psychological antecedents and consequences of financial decisions and, thus, of financial crises. Our aim is to complement economists’ analyses of financial crises past and present (see Rapp, 2009,

for a review). We will also highlight important areas where more psychological research is needed.

In financial markets, actors take risks and evaluate future consequences of the risks they take. In the next two sections, we will review some research on economic risk taking and financial decision making that helps to understand bounded rationality in financial markets. The subsequent two sections constitute the primary foci of the monograph: behavior in two types of financial markets, the stock market and the credit market. Already in 1972, Paul Slovic published an article in the *Journal of Finance* in which he identified research findings on judgment and decision making with bearings on investor behavior in stock markets (Slovic, 1972b). In the section analyzing behavior in stock markets, we will likewise propose explanations based on research on judgment and decision making but also based on research on affective and social influences. In the section on behavior in credit markets, we review research addressing psychological accounts of decisions prior to taking up credit, the actual credit take-up decision, and psychological phenomena occurring during the repayment period.

In order to understand the serious consequences that bounded rationality in financial markets may have, in a subsequent section we review research on how financial crises affect people's well-being. Governments in many Western countries have recently implemented new pension systems requiring that the citizens themselves make investments in stock funds. Instead of a fixed pension related to the accumulated income, the pension in the new systems will also depend on how successful individuals are in investing in funds. In the current financial crisis, many households' pension savings have been dramatically reduced. What can be done to avoid such negative consequences in the future? In credit markets, households are offered loans. An antecedent to the current financial crisis is that loan giving has been optimistically liberal. We review research showing that too-optimistic loan giving has pervasive, short-term as well as long-term consequences for household economic behavior, including spending, saving, and consumption. As we note in a subsequent section, another serious consequence is reduced trust in financial institutions.

A final section takes a wider social psychological or sociological perspective on the role of institutions and governments in causing economic crises and, more importantly, on what governments can and need to do to prevent or normalize the economy after a crisis. This section is necessarily speculative, but we include it to highlight some of the shortcomings of research that focuses exclusively on individual behavior to understand societal outcomes.

## Economic Risk Taking

People take economic risks with personal loans, credits, and mortgages; trade risky equities in the stock market; purchase inefficient or risky products; and accept insecure jobs. Consumer decisions are similarly related to risk, as the outcomes are often highly uncertain and may have serious and life-long

consequences. People who choose risky financial products are more likely to be affected by financial crises and recessions. **A distinction can be made between instrumental risk taking, for instance investing, and stimulating risk taking, for instance gambling. Instrumental risk taking is oriented toward future benefits, whereas stimulating risk taking is more present-time and experience oriented (Zaleskiewicz, 2001).**

A distinction between risk and risk events also needs to be made. Risk is defined as the probability of decision outcomes in the context of expected-utility theories (e.g., von Neumann & Morgenstern, 1947; Savage, 1954; Starmer, 2004), which have been applied to understand financial decision making. The term uncertainty is instead used if an explicit quantification of the probability is not made. Risk events are defined as low-probability negative outcomes (Slovic, 1987, 2001; Vlek & Stallen, 1980). In a risk event such as a lottery, the probabilities may be known (although few buyers of lottery tickets are likely to want to know them), whereas in a risk event such as an investment, there is uncertainty because the probabilities are unknown (but investors would like to know them). Furthermore, economic risk taking mostly pertains to perceived financial risks. Other possible risk events include health, social, ethical, and recreational risks. It is important to note that risk taking is domain specific. **At an individual level, risk taking in one domain (e.g., the financial domain) has little or no relationship with risk taking in another domain (e.g., the social domain; Weber, Blais, & Betz, 2002).**

Risk taking, economic or otherwise, is mediated by risk perception, risk attitude (asymmetric risk attitude as related to risk taking will be discussed in the following section on financial decision making), and risk propensity—that is, the extent to which one is aware of a risk, whether it is judged to be positive (an opportunity to gain) or negative (a threat of losing), and the extent to which one intends to take the risk. Risk taking is also moderated by person and situational factors.

## Risk perception

In psychology, risk is conceptualized as a subjective construct influenced by how an event is interpreted (Rottenstreich & Tversky, 1997; Tversky & Koehler, 1994; Weber, 2004). Risk is therefore perceived differently by different people in different contexts (Diacon & Ennew, 2001). An analysis of how people make investment decisions confirms that objective assessments of probability have only a weak impact on the decision-making process (Capon, Fitzsimons, & Prince, 1996). Other aspects are thus taken into account when making decisions under uncertainty, and people are more influenced by perceived risk than by objective risk (Diacon & Ennew, 2001). Risk perception is an indispensable component of financial decision making and other risk-taking behaviors. It has furthermore been noted (e.g., Shleifer, 2000) that risk perception is an important but under-researched topic that is essential for understanding investment decision making in stock markets.

Risk perception encompasses an assessment of the degree of situational uncertainty, controllability of that uncertainty, and

the confidence in these estimates (Sitkin & Weingart, 1995). It is thus the outcome of a combination of genuine uncertainty, lack of knowledge, and the seriousness of the possible consequences (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978). Risk perception is basically a cognitive assessment, but it is influenced by affects such as fear, regret, and optimism (Loewenstein, Weber, Hsee, & Welch, 2001). As a cognitive assessment, it is susceptible to many biases (Slovic, 1987, 2001). One of these biases particularly highlighted in financial markets is overconfidence (Glaser, Nöth, & Weber, 2004), which may be displayed in different ways. People may believe that their knowledge is more accurate than it really is (Lichtenstein, Fischhoff, & Phillips, 1982), may think that their abilities are above average (Svenson, 1981), may have an illusion of control (Langer, 1975), or may be excessively optimistic about the future (Weinstein, 1980). With increasing experience and familiarity, decision makers have the tendency to focus on their own abilities and successes rather than on situational factors. They will rely on their own routines and judgments of the past and, when making a choice, will not process all relevant information. As a result of their overconfidence, people are prone to underestimate the actual risks and overestimate their abilities to overcome unforeseen problems (Jemison & Sitkin, 1986; March & Shapira, 1987).

### Risk propensity

Risk propensity is defined as a general behavioral tendency to take or avoid risk in a specific domain. It is closely related to and frequently equated with actual risk taking behavior. Sharma, Alford, Bhuian, and Pelton (2009) recently proposed a higher-order model of (consumer) risk propensity. In this model, risk propensity is determined by three first-order factors: perceived risk, risk attitude, and price consciousness.

Kogan and Wallach (1964) developed the Choice Dilemma Questionnaire (CDQ) to measure individuals' attitudes toward risk. More recently, the CDQ has been used to assess individuals' risk propensity as well (Harrison, Young, Butow, Salkeld, & Solomon, 2005). Weber et al. (2002) developed a domain-specific risk propensity scale that included the financial domain and distinguished, within that domain, between investing and gambling. They found that the perception of benefits and risk are related to gender and domain differences in risk taking. Recently, Meertens and Lion (2008) developed a risk propensity scale to distinguish risk avoiders from risk takers, but they did not distinguish different domains of risk taking.

Risk-avoiding decision makers are more likely than are risk-takers to attend to and weigh negative outcomes and thus overestimate the probability of losses relative to the probability of gains. They consequently require a higher probability of gains to tolerate the exposure to failure (Schneider & Lopes, 1986). In contrast, risk-seeking decision makers are more likely to attend to and weigh positive outcomes more highly and overestimate the probability of gains relative to the probability of losses (Brockhaus, 1980; Vlek & Stallen, 1980). The distinction between risk avoidance and risk seeking is rather similar

to the distinction made in regulatory focus theory (Higgins, 1998; Zhou & Tuan Pham, 2004) between prevention focus (avoiding negative outcomes) and promotion focus (striving for positive outcomes). Risk propensity is often measured by analyzing observed behavioral patterns rather than by means of responses to questionnaires. Risk propensity may be relatively stable over time and learned in socialization or acculturation. Yet it is also changeable and accounts for the capacity of people to learn from experience and adapt their decision making to new situations (Sitkin & Weingart, 1995).

Risk propensity may also be explained by habitual or routine ways of handling risky situations. These routine patterns tend to persist over time. Decision makers who have been risk averse in the past are likely to continue to make cautious decisions, whereas decision makers who have been risk seeking in the past are likely to continue to make risky and adventurous decisions (Kogan & Wallach, 1964; Rowe, 1977; Slovic, 1972a). Yet a pattern of routine risk taking will not persist when it is proven unsuccessful. Knowledge of outcomes, positive and negative reinforcements, will then affect adaptations to changing circumstances (Osborn & Jackson, 1988). In contrast to the stability of successful decision makers, unsuccessful decision makers will change their strategies. Thus, negative outcomes lead to changes. However, changes are also influenced by whether decision makers attribute successes and failures to their own actions or to situational factors beyond their control (Einhorn & Hogarth, 1978). People tend to attribute successful outcomes to themselves and failures to others or to circumstances. This leads to an incomplete and biased learning of events and increasing overconfidence.

People high in risk propensity are likely to buy risky financial products. They will benefit from the favorable returns (gains) of these products in periods of economic upswing and growth, whereas in periods of economic recession they are likely to run into problems when confronted with the unfavorable returns (losses) of their financial products.

### Sociodemographic factors

In order to explain effects of sociodemographic factors on general risk taking, some researchers have adopted an evolutionary perspective (Wang, Kruger, & Wilke, 2009). Thus, women are less risk taking than men.<sup>1</sup> Parenthood seems to reduce risk taking. Older people show a lower risk propensity. A remaining unresolved issue is to what degree the effects of sociodemographic factors attributed to evolution pertain specifically to economic risk taking. It has been established, however, that women are more risk averse in making financial decisions than are men (Donkers & Van Soest, 1999; Powell & Ansic, 1997; Weber et al., 2002). Women also tend to own less risky assets than single men or married couples and reduce their risky assets when the number of children increases, in contrast to single men and married couples (Jianakoplos & Bernasek, 1998). And older people tend to take less financial risks than younger people (Jianakoplos & Bernasek, 2006). A relevant educational factor is the lack of financial knowledge or, for many people,

even the lack of motivation to acquire the necessary financial knowledge (Antonides, De Groot, & Van Raaij, 2008). People with poor knowledge of financial products and associated risks are thus more likely to buy financial products that do not match their needs and their financial budgets. In a study comparing identical and nonidentical twins, Zyphur, Narayanan, Arvey, and Alexander (2009) found a genetic effect on economic risk preferences with the heritability estimated to be 0.63. This means that over half of the variance in economic risk preferences is explained by genetic factors.

### Personality factors

Personality factors that have been identified as affecting financial risk taking include sensation seeking, extraversion, impulsivity, openness to experience, conscientiousness, anxiety, and neuroticism. Sensation seeking (Zuckerman, 1994) is motivated by the need for arousal of the central nervous system. This need is met by varied, complex, novel, and intense stimulation and experiences. High sensation seekers have a need for arousal and therefore tend to take more and larger risks than do low sensation seekers (Wong & Carducci, 1991). Extraversion has an established relationship with the need for arousal and therefore with sensation seeking (Lauriola & Levin, 2001). Sensation seeking and extraversion may affect financial risk taking. Young people are generally more extraverted and open to new experiences than are older people, and this may partly explain the effect of age on risk taking.

Individuals high on impulsivity take more risks because they do not analyze all choice alternatives or all attributes of these alternatives. They either are eager to make a quick decision to enjoy the benefits of the chosen alternative, want to avoid the unpleasant emotions and effort arising from trading off alternatives, or want to avoid the opportunity costs of processing information. Impulsivity is an indicator of two higher-order personality traits, openness to experience and conscientiousness. Individuals high on impulsivity are more open to new experiences and are low on conscientiousness. Openness to experience is related to a need for arousal and thus leads to a high risk-seeking propensity. High conscientiousness is related to processing more information about choice alternatives and focusing on the most certain alternative, and is thus related to a low risk-taking propensity.

Impulsivity is also related to time preference. Time horizon is particularly relevant for financial decisions that pertain to the distant future, such as a home mortgage, participation in a pension plan, and saving or investing for old-age provisions. People with a present-time orientation (high time preference) focus on the present and prefer to spend their money immediately rather than later (Frederick, Loewenstein, & O'Donoghue, 2002). People with a future-time orientation (low time preference) are more willing to delay the gratification of having products and services immediately. They prefer to save and form a buffer for unforeseen expenditures and for the future in general.

Trait anxiety has the most consistent relationship with risk taking (Lauriola & Levin, 2001). High trait-anxious individuals

have a bias toward processing threatening information, which is a possible cause of their biased risk perception (Gasper & Clore, 1998). This has been found to be a general tendency that is not limited to particular situations (Butler & Matthews, 1987). Trait anxiety is an indicator of the higher-order personality trait neuroticism. People that score low on extraversion and high on neuroticism are characterized by a risk-avoiding propensity and thus by taking fewer or smaller financial risks.

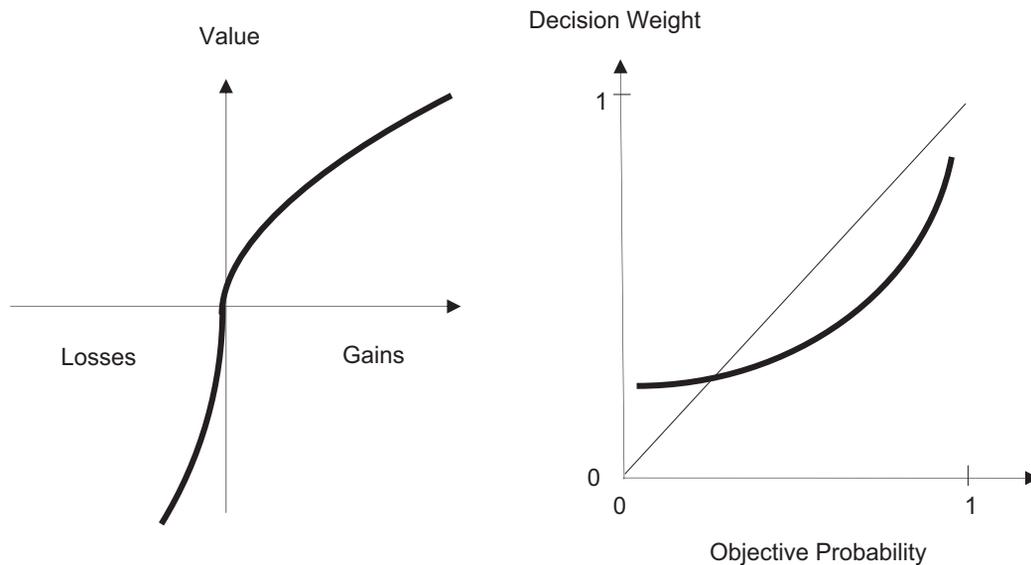
### Confidence

Another factor is confidence—that is, optimism versus pessimism—regarding the economic situation and future economic developments. In a period of economic recession, people are less confident and more pessimistic about the future economic conditions and about their own financial situation. As a consequence, they avoid risky decisions with large economic consequences, such as buying houses, cars, and other durables. They also save more, take less credit, and prefer to pay back their personal loans. In a period of economic upswing, however, people are more confident and optimistic about the future economic conditions and about their own financial situation. As a consequence, they are more inclined to buy houses, cars, and other durables, as well as more luxury services, such as visiting restaurants and going on vacation. They also save less and use more purchase-related financing, such as mortgages and installment credit (van Raaij & Gianotten, 1990).

Optimism may also be relatively stable, thus referred to as dispositional optimism (Scheier, Carver, & Bridges, 1994). Puri and Robinson (2007) define dispositional optimism as generalized positive expectations about future events. Dispositional optimism is highly relevant for financial decision making since it relates to expectations about the future. Dispositional optimism may influence both the risk perception and risk propensity that determine risk taking. It has a strong relationship with entrepreneurship. Entrepreneurs are more optimistic and risk tolerant than non-entrepreneurs are. The financial behavior of optimists will be more risk seeking than the financial behavior of pessimists will be. Dispositional optimists expect more positive outcomes of their investments, and they envision fewer negative scenarios in which they will lose their investments.

### Summary

Risk taking is an important component of financial decision making. It is mediated by risk perception, risk attitude, and risk propensity, and it is modified by sociodemographic, personality, and situational factors. People high in sensation seeking, extraversion, and openness to experience are likely to take more and higher financial risks, whereas people high in conscientiousness, anxiety, and neuroticism are likely to take fewer financial risks. Women, parents, and older people are also less likely to take financial risks. Consumers and investors with a high confidence in the future are more likely to take financial risks. Overconfidence and optimism are other psychological factors that make people take financial risks with



**Fig. 1.** Prospect theory's value (left) and decision-weight (right) functions. The former shows how subjective value increases with objective value—either gains or losses; the latter shows how decision weights used to multiply value in decision making vary with objective probability. Note that very small probabilities receive no weight, whereas very large probabilities receive maximal weight.

possibly disastrous consequences for their financial situation. The general implication is that financial crises may have more serious consequences for people who are more likely to take financial risks.

## Biases in Financial Decision Making

Several factors are known to cause deviations from a normative theory of financial decision making. Money plays a more dominant role in financial markets than it does in markets for goods and services. Therefore, differences between the subjective and nominal value of money are a factor that we will discuss. A second factor we will discuss is framing of outcomes of decisions as gains or losses with consequences for attitudes towards financial risks (asymmetric risk attitudes) and taking of financial risks. A third factor we will discuss is loss aversion, the fact that people dislike losses more than they like gains.

### Subjective value of money

In the movie *Other People's Money*, the corporate raider Lawrence Garfield (“Larry the Liquidator”) states “I love money more than the things it can buy!” This highlights the subjective character of the value of money. More commonly, the value of money itself does not differ this clearly from the value of its purchasing power in people’s minds. Yet, there are several deviations of the real value of money from its nominal value (that is, the numbers on notes and coins) that question its status as a *unit of account*—that is, as a measure for valuing things (Lewis & Mizen, 2000).

Bernoulli (1738/1954) introduced the notion that money has a subjective value that differs from its nominal value. He proposed that the subjective value of money increases with its

nominal value according to a concave (logarithmic) function. Galanter (1962) used psychophysical scaling methods with the aim of measuring the subjective value of money. Participants were asked to judge how much money it would take to make them twice as happy compared to receiving US \$10 (or \$100 or \$1,000 in different groups). A good fit to the data was provided by a concave power function ( $y = ax^b$ , where the function’s steepness is represented by  $a$  and its curvature by  $b$  approximately equal to 0.50), closely similar to a logarithmic function. Galanter (1990) also investigated the subjective value of money for losses. In this case, participants were asked whether they would be more or less than twice as upset at a loss of US \$5 (or \$50 or \$500) than at a loss of US \$10 (or \$100 or \$1,000). Approximately the same power function fit the results. In contrast, Tversky and Kahneman (1992) showed that the function for losses was approximately twice as steep as that for gains.

The concave form of the value function (as illustrated in Fig. 1), referred to as “diminishing sensitivity,” is frequently found to describe the relation of sensation to physical measure scales in psychophysics (Weber, 2004)—for instance, the relation of loudness to sound pressure. In psychophysics, some neurophysiological mechanism or process has frequently been evoked as an explanation of the function’s concave form. Is there any similar mechanism that can account for the concave value function of money? Stewart, Chater, and Brown (2006) proposed a theory that a monetary value is evaluated through comparison with values sampled from long-term memory. In this view, the concave value function reflects the fact that the greater monetary values are, the less frequently they are encountered in people’s daily lives. Another possibility to explain diminishing sensitivity to increasing monetary amounts, suggested by Linville and Fischer (1991), is that

people have limited cognitive and affective resources to savor gains. This alternative account is attractive because of its similarity to neurophysiological explanations of psychophysical relations. **It does not exclude the fact that the value of monetary amounts is sometimes related to, for instance, purchase contexts in daily lives. As noted by Kahneman and Tversky (1979), if a certain amount of money is needed to purchase a desired product, the money's subjective value (temporarily) becomes higher than its objective value, and this represents a discontinuity of the value function. An experimental demonstration is the "break-even" effect (Thaler & Johnson, 1990): A lost amount of money in a gamble becomes very attractive to win back.**

A resulting conjecture is that the value of money to some extent depends on its experienced purchasing power in markets for goods and services. An opportunity to investigate how the value of money is learned arose when, in 2001, 12 European countries changed their domestic currencies to a common currency, the euro (Gärling & Thøgersen, 2007). In order to assess how well citizens adapted to the euro transition, Marques and Dehaene (2004) conducted monthly surveys before and after the transition in Austria and Portugal and attempted to distinguish between a rescaling hypothesis (conversion from the domestic currency to the euro through multiplication by a multiple or fraction) and a relearning hypothesis (relearning product prices in the new currency). Participants estimated the euro prices of a sample of selected products, as well as estimating how frequently they purchased these products. In both countries, the variability of the price estimates decreased with time, approaching the variability in price estimates in the respective domestic currencies before the transition, which indicated that the value of the euro was learned. The fact that in Austria the variability of the price estimates decreased faster for more frequently purchased products than for less frequently purchased ones was taken as evidence that the value of the new currency was acquired by learning product prices in the new currency. Since no such effect of frequency of purchase was shown in Portugal, it was concluded that rescaling probably was dominant in that country. In surveys conducted by Hofmann, Kirchler, and Kamleitner (2007), Austrian citizens reported that they adapted to the currency transition by different means, the most frequent one being learning prices of frequently purchased products in the new currency. Rescaling was more frequent for exceptional purchases—for instance, of expensive durable goods.

Extending the relearning hypothesis to the general case of learning the value of money, Juliusson, Gamble, and Gärling (2005) hypothesized that the acquisition of knowledge of product prices is only a first stage of learning; in a second stage, the inverse of the product prices is then used to infer how much one can purchase for the money. Juliusson et al. (2005) demonstrated that this is an easy task but that it is less easy if the inverse is a fraction than if it is a multiple, and still less easy if, as in real life, product prices vary, either systematically (Juliusson, Gamble, & Gärling, 2006) or stochastically (Gärling, Gamble, & Juliusson, 2007).

Learning the value of money is also made more difficult when prices change due to inflation. The money illusion has been recognized for a long time (Fisher, 1928). It refers to the tendency to disregard the real value (i.e., purchasing power) of money and focus instead on its nominal value. Inflationary changes are therefore not perceived. **Shafir, Diamond, and Tversky (1997) conducted a series of experiments demonstrating the existence of the money illusion in hypothetical earnings, transactions, contracts, and issues of fairness. The results were consistent in showing that the participants did not fully take into account inflationary changes in the value of money. Confusing the real value of money with its nominal representation sometimes led them to make economically sub-optimal choices. The possible role of the money illusion for the macro-economy was experimentally demonstrated by Fehr and Tyran (2001) and recently discussed by Akerlof and Shiller (2009) and Tyran (2007) in an attempt to disentangle determinants of the current financial crisis.**

Related to the money illusion is the euro illusion (also referred to as the face-value illusion; Gamble, 2007; Raghuram & Srivastava, 2002)—that is, that a change in exchange rate influences price evaluations. Thus, a price for the same product in euros is perceived as cheaper than the price in some other currency (such as the Italian lira) with a higher nominal value. However, the illusion reverses if the price is evaluated relative to income or a budget for the purchase (Gamble, 2006; Hofmann, Kamleitner, Kirchler, & Schulz-Hardt, 2006). Thus, the price is evaluated as higher when the difference between the price and the income or budget is nominally smaller (when expressed in euros) than when it is nominally larger (when expressed in lire). The nominal representation appears to function as an anchor from which insufficient adjustments are made. The illusion may also result from an improper use of the numerosity heuristic (Pelham, Sumarta, & Myaskovsky, 1994). This heuristic is a sensible cognitive simplification under many circumstances, but its use may be overgeneralized. An illustrative example is that, in general (but not always), two different cakes contain more calories than one cake.

The effect of the nominal representation of money (i.e., face value) also reflects a more general psychological phenomenon whereby an easily accessible attribute affects judgments and decision making (Kahneman, 2003a). A distinction between intuitive and deliberate judgments is made. Intuitive judgments are similar to perception in being fast and immediate responses to easily accessible information. Such judgments may be overridden by deliberate judgments characterized by a slow sequential process involving retrieval of information from long-term memory that has bearing on, and changes the interpretation of, the directly accessible information. In line with this, the effect of the nominal representation may be eliminated, for instance by acquiring and applying knowledge of the inflation rate. **However, as reviewed by Ranyard, Del Missier, Bonini, Duxberry, and Summers (2008), perceived inflation is frequently inaccurate.** Similarly, Lemaire and Lecacheur (2001) found that many inaccurate conversion rules were deliberately applied to calculate the value in one currency (Euro) from the

value in another currency (French Franc). As a consequence, errors may remain, although they may differ in direction and magnitude.

Expectations also seem to play a role. In connection with the euro changeover, expectations in many countries were that prices would increase (e.g., in Germany where the euro was called the “teuro,” alluding to the German word *teuer*, for “expensive”). Traut-Mattasch, Schulz-Hardt, Greitemeyer, and Frey (2004) showed that such expectations had an impact. When conversion of prices into euros led to a higher nominal value, this was accepted as an accurate outcome. In contrast, conversions leading to an unexpected outcome were double-checked. This resulted in a bias toward estimates of higher prices in euros than in nominally larger German Marks.

### Asymmetric risk attitudes

Expected-utility (or value) theory is a normative theory of financial decision making that was developed in the 1940s and 1950s (von Neumann & Morgenstern, 1947; Savage, 1954). It has since then undergone several further developments (Starmer, 2004). Assume that a choice is made between receiving a fixed sum of money, say \$10, and purchasing a lottery ticket offering the opportunity to win 100 times this amount (i.e., \$1,000) with a probability of .01. The expected value of the lottery is the multiplication of this probability by 1,000, giving the value of 10. One win should thus be expected for an infinite number of repeated random samples of 100 lottery tickets. Risk attitude is a construct introduced in expected-utility theory. Being indifferent between receiving a sure \$10 and having a .01 probability of winning \$1,000 is referred to as a neutral risk attitude. A preference for \$10 in the example is referred to as a risk-averse risk attitude, a preference for the gamble (purchasing the lottery ticket) a risk-seeking risk attitude. If the value function is concave, the value of 10 would be higher than the value of .01 times 1,000 and thus would be preferred. If the function is linear, the certain and the risky alternatives would be the same and thus lead to indifference. If the value function is convex, the value of 10 is lower and the risky alternative is preferred.

Prospect theory, proposed by Kahneman and Tversky (1979), is probably the most influential of what are referred to as nonexpected- or generalized-utility theories (Camerer, 1989, 2000). The theory won Kahneman the Nobel Prize in economics in 2002.<sup>2</sup> In expected-utility theory, a choice alternative is evaluated by considering all its exhaustive and mutually exclusive outcomes in the future (also discounting time), then computing the expectation by multiplying the evaluation of each outcome with its probability. The alternative with the highest expected value is then chosen. The evaluations made in prospect theory are evaluations of the difference between an outcome and a reference point. For instance, if a stock share increases or decreases in price from the purchase price, the change is assumed to be evaluated as a gain or loss, respectively. In expected-utility theory, the current price is added to (or subtracted from) the total wealth. Unless the

person is broke, the outcome is therefore always a gain. In experimental studies (e.g., Kahneman & Tversky, 1979), it has been shown that the evaluations of outcomes differ in a systematic way depending on whether they are coded as gains or losses. When coded as gains, less-risky outcomes are preferred to more-risky outcomes (risk aversion), whereas the reverse is true for losses (risk seeking). This is labelled the reflection effect. In prospect theory, the reflection effect is accounted for by postulating a concave value function (as described above) for gains but a convex value function for losses (see Fig. 1). In order to be able to predict the evaluation of an outcome, it is thus necessary to know whether the outcome is coded as a gain or loss. The coding is posited in prospect theory to take place in an editing phase preceding the evaluation of the outcome. The reference point is usually the status quo but, as we will describe below, may be changed by framing.

A second distinguishing feature of prospect theory, also to be described below, is that the value function is steeper for losses than it is for gains. Thus the same decrease will be evaluated as worse if it is coded as a loss than it will be if it is coded as a reduced gain—referred to as loss aversion.

A third deviation from expected-utility theory is that in forming an expectation, the evaluations are multiplied by decision weights, which are nonlinearly related to probability (as shown in Fig. 1). **An explanation of the form of the decision-weight function was proposed by Prelec (2000). Its form has also been shown to vary with different factors, for instance the certainty with which the probabilities are assessed (also referred to as second-order probabilities; Hogarth & Einhorn, 1990; Tversky & Fox, 1995) or the extent to which the outcomes are emotion laden (Rottenstreich & Hsee, 2001).** When certainty decreases or the emotional content increases, the function becomes less steep, meaning the decision weights are less important for the evaluation of the choice alternatives. The fact that low probabilities receive higher weights accounts for the fourfold pattern of risk attitudes (Tversky & Kahneman, 1992). When the probability of the outcome is large, risk attitude shows the asymmetry discussed previously—that is, risk aversion for gains and risk seeking for losses. This pattern is reversed when the probability is small because of the higher weight the low probability receives. Although sensation-seeking versus security needs are likely to also play important roles, the reverse pattern of risk attitude caused by overweighing of low probabilities, and thus acting as if low probabilities are higher than they are, is consistent with the paradox that people facing low probabilities (and expected values) are willing to purchase both lottery tickets and insurance.

Fox and Tversky (1998) generalize prospect theory to conditions of uncertainty—that is, conditions in which the probability of an outcome is not known. Such conditions are common in real life, and include stock and credit markets. As Edwards (1954) proposed in subjective-expected-utility theory, inputs to the decision weights (see Fig. 1) are subjective probabilities rather than objective probabilities. By replacing objective with subjective probabilities, the extensive research on how subjective probabilities are formed through the application

of the judgment heuristics of availability, representativeness, and anchoring and adjustment (see Gilovich, Griffin, & Kahneman, 2002, for an overview) becomes integrated with prospect theory. In addition, an integrative theory of subjective probability, referred to as support theory (Rottensteich & Tversky, 1997; Tversky & Koehler, 1994), has been proposed.

## Framing

Kahneman and Tversky (1979) introduced framing through the observation that a reference point may shift in such a way that a gain appears to be a loss or a loss appears to be a gain. According to the reflection effect described previously, the former shift would lead to choices of riskier alternatives than would the latter. As an example, consider that people facing a choice between a certain outcome and a risky outcome (winning an amount of money with some probability or nothing with the complementary probability) may frame the risky outcome differently, either considering the worst case (receiving nothing) or the best case (winning). Whether the loss frame (the reference point being the amount of money to be gained) or the gain frame (the reference point being getting nothing) is adopted determines the evaluation of the outcome. **Tversky and Kahneman (1981) extended framing to several other phenomena, as have subsequent researchers (see review by Soman, 2004, who distinguishes between the framing of outcomes, structures, and tasks).**

Meta-analyses (Kühberger, 1998; Levin, Gaeth, Schreiber, & Lauriola, 2002; Levin, Schneider, & Gaeth, 1998) demonstrated the strongest effects of framing for reference-point shifts. Different means have been employed to induce such shifts. Verbal labels may make a reference point salient. For instance, the content of meat products may be framed either as  $P\%$  fat free (making  $0\%$  fat free the reference point) or  $(100 - P)\%$  fat (making  $100\%$  fat the reference point).  $P\%$  fat free will then appear to be a gain and be more positively evaluated than will  $(100 - P)\%$  fat, which appears to be a loss. Levin and Gaeth (1988) found that whether fat content of meat was described as percentage fat or percentage fat free even affected the taste of the meat. A similar procedure was used by Kristensen and Gärling (1997). In dyad negotiations of the price of a condominium, different reservation prices were shown to affect the degree to which the initial offers were perceived as gains or losses. As a consequence, the outcomes of the negotiations differed.

Multiperiod experiments are another, more general means of influencing reference points. Gärling, Karlsson, Romanus, and Selart (1997) reviewed and analyzed the results of such experiments employing several different paradigms. In the simplest case, participants are informed about or experience the outcome of a previous choice and are then asked to make a new choice that is independent of the previous one. Gärling and Romanus (1997) demonstrated an asymmetrical influence such that when future potential losses were evaluated, the prior outcome influenced the reference point by making the evaluation worse if the prior outcome was a loss and better if

it was a gain. In contrast, evaluations of gains were not influenced by the prior outcome. In their account of this asymmetry and similar effects on evaluation of sequential outcomes (see Linville & Fischer, 1991), Thaler and Johnson (1990) proposed that the editing phase posited in prospect theory is partly governed by cognitive simplification and partly by hedonic principles (labelled hedonic editing)—that is, the motivation to feel good. Hedonic editing is an instance of mood regulation that we will discuss in the next section as an account of some regularities of investor decision making in stock markets.

Related to the coding of outcomes as gains or losses, Thaler (1980, 1985, 1999) and Tversky and Kahneman (1981) proposed that coding of outcomes is made in mental accounts. The existence of mental accounts violates the basic assumption that money is exchangeable (the principle of fungibility). Tversky and Kahneman (1981) defined a mental account as “an outcome frame which specifies (i) the set of elementary outcomes that are evaluated jointly and the manner in which they are combined, and (ii) a reference outcome that is considered neutral or normal” (p. 456). As an empirical example, Tversky and Kahneman (1981) found that participants were less likely to buy a new theater ticket if they had lost one than they were if they had lost the equivalent amount of money. The explanation is that the participants evaluated the loss of the ticket and the price of a new ticket in the same mental account, whereas the loss of money and the price of the ticket were evaluated in separate mental accounts.

In Tversky and Kahneman (1981), which mental accounts an outcomes is coded to is specific to a particular decision to be made. In contrast, the mental accounts referred to by Shefrin and Thaler (1988) in their behavioral life-cycle theory are instead already existing mental accounts that are part of people’s financial knowledge and therefore presumably higher-order, more stable cognitive structures. According to that theory, people categorize monetary assets in three mental accounts: current income, current assets, and future income. Shefrin and Thaler did not argue that these three accounts are the only ones but that they are the most basic and general ones. The current-asset account may, for instance, be divided into subaccounts, and different households may use different subaccounts. Such subaccounts may be assets for specific goals—for instance, holiday money, money for clothing, money for food, and so on.

The behavioral life-cycle theory was proposed as a psychologically realistic alternative to Modigliani and Brumberg’s (1954) life-cycle theory of savings and the related permanent-income hypothesis (Friedman, 1957). The latter implies that people strive toward uniform consumption during the life cycle, implying that they take loans when their income is low and is expected to be higher in the future and that they save when their income is higher than expected. **Empirical observations have however demonstrated that current income is a more important factor than the theory predicts, in that middle-age households have a higher degree of consumption than do younger and older households (Courant, Garmlich, & Laitner, 1986). The data are consistent with the behavioral life-cycle theory in showing that**

consumption is more dependent on current income than expected.

Since the three mental accounts posited in the behavioral life-cycle theory correspond to actual accounts, one may question what is gained by labeling them mental accounts. Self-control techniques of desire reduction and increasing willpower (Hoch & Loewenstein, 1991; Karlsson, 2003) aim at overcoming the temptation of immediate consumption of a specific object or in a specific situation. The use of mental accounts (Shefrin & Thaler, 1988) is assumed to serve as a self-control strategy at a more general level by imposing constraints on spending money. Because mental accounts are not formed in relation to a specific situation or object, they are particularly well suited to explain patterns of consumption and saving across the life cycle.

Shefrin and Thaler (1988) referred to an individual's internal conflict between short-term and long-term preferences as a conflict between a "planner" and a "doer." The planner is assumed to be far-sighted and to strive toward maximizing life-long utility, while the coexisting doer is assumed to be myopic and impulsive, striving toward maximizing immediate benefits. In order to satisfy long-term preferences, it is necessary to exert self-control. Since pure willpower is more costly, people are expected to seek strategies to achieve self-control. The decomposition of wealth into mental accounts is one such strategy. The marginal propensity to consume from the three different mental accounts is thus assumed to decrease from current income to current assets and from current assets to future income. That is, the temptation to spend money on consumption is expected to be largest from the current-income account, next largest from the current-assets account, and least from the future-income account.

### Loss Aversion

Loss aversion refers to people's tendency to dislike losses more than they like gains. An even chance of winning or losing a small amount of money would therefore be preferred to an even chance of winning or losing a large amount of money. This follows from the steepness of prospect theory's value function for losses (see Fig. 1). As noted by Camerer (2005), loss aversion has been invoked as an explanation of many deviations from rational decision making. We limit ourselves here to the endowment effect (Kahneman, Knetsch, & Thaler, 1990; Knetsch, 1989; see Cummings, Brookshire, & Schulze, 1986, and Novemsky & Kahneman, 2005, for reviews)—that is, that people demand a higher price to sell something they own than they are willing to pay for acquiring it.

In experiments with undergraduates, Kahneman et al. (1990) found that since sellers asked about twice as much as buyers were prepared to pay, the number of purchases was dramatically low. As one should expect if loss aversion is the sole explanation, the endowment effect appears to be immediate, although its strength in fact increases with the length of possession of the good and decreases with the similarity between the endowed goods and the goods not endowed (Strahilevitz &

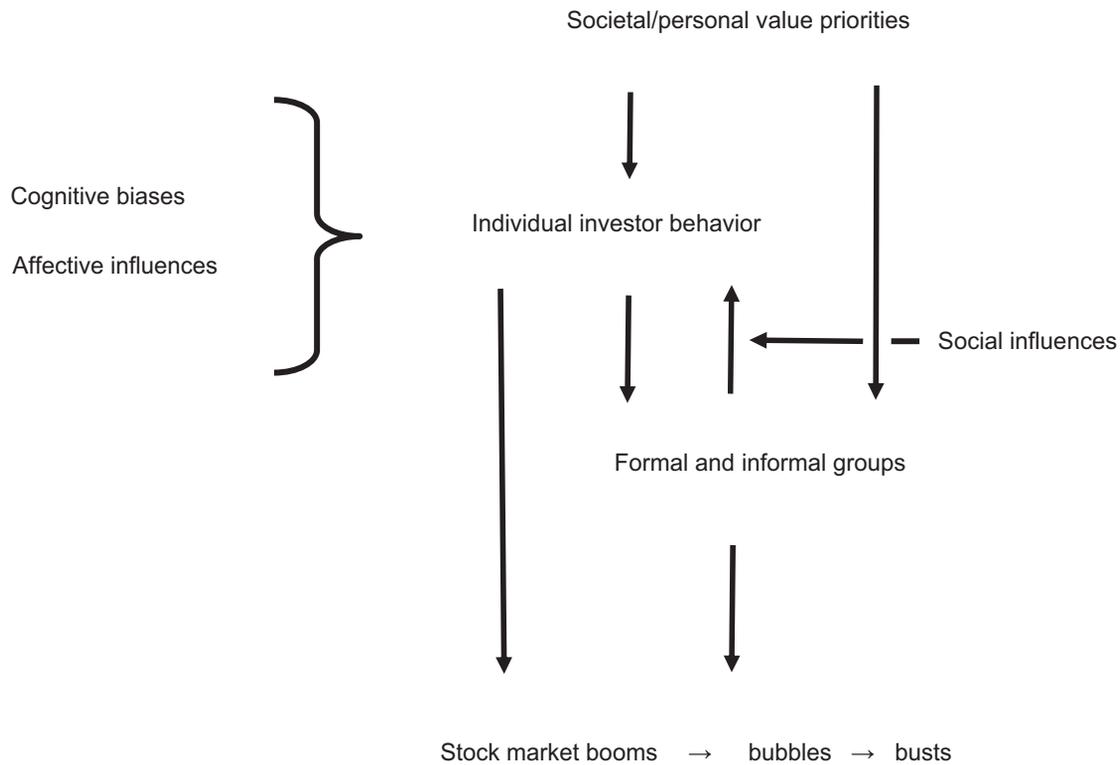
Loewenstein, 1998). Furthermore, the endowment effect may also occur for goods whose possession is merely desired (Carmon, Wertenbroch, & Zeelenberg, 2003). Lerner, Small, and Loewenstein (2004) also show that the endowment effect is reduced if a negative mood is induced before the good is acquired. Carmon and Ariely (2000) suggest that buyers perceive paying the price of a good as a loss, whereas sellers perceive losing the benefit of the good as a loss. On the basis of previous research and experiments they themselves carried out, Novemsky and Kahneman (2005) argue that a full account of loss aversion (and thus the endowment effect) must go beyond the account in terms of the steepness of prospect theory's value function. They make the point that loss aversion is not invoked by spending money that is within an intended budget for purchases but only when it exceeds the intended budget.

### Summary

This section reviewed several known deviations from the normative theory of financial decision making. These deviations include the differences between the subjective and nominal value of money (i.e., the nonlinear value function of money, money illusion, and mental accounting resulting in the non-fungibility of money), asymmetric risk attitudes and framing of decision outcomes (differences in risk seeking depending on framing of outcomes as gains or losses), and loss aversion (avoiding losses being more valuable than obtaining gains). The following section will disentangle how these deviations from the normative theory contribute to anomalies in stock markets and, after being potentiated by affective and social influences, market booms and busts.

### Behavior in Stock Markets

In stock markets, investors trade stock shares.<sup>3</sup> Why do they trade? A rational analysis suggests that investors only trade if they differ from each other, for instance in their liquidity needs, in their risk perceptions or attitudes, or in their knowledge. However, a general belief among researchers is that these differences are not sufficient to explain the high trading volumes observed in stock markets (Odean, 1999). A reason for high trading volumes may be that stock share prices are too low or too high. According to efficient-market theory proposed in financial economics (Fama, 1970),<sup>4</sup> if the trading prices of stocks deviate from their fundamental values (i.e., their present value taking into account what they will be worth in the future) because of trading by non-experts, generally referred to as "noise traders," it will increase trading by rational investors, which eventually will correct the prices. This correction of prices is labelled arbitrage. Yet, the validity of efficient-market theory is challenged by empirical observations that arbitrage nullifies the effect of noise traders to a limited extent (DeBondt, 2008; Shleifer & Vishny, 1997). Possible reasons are lack of mispriced, fully substitutable stocks to purchase, uncertainty about fundamental stock values, and, as a consequence, uncertainty about whether price trends will continue.



**Fig. 2.** The joint influences on stock market booms and busts of societal/personal value priorities, cognitive biases, affective factors, and social factors. Individual investor behavior is considered to be influenced by societal, organizational, and personal value priorities. It is also susceptible to cognitive biases exaggerated by affective influences. When investors influence each other, the market effect of these cognitive biases and affective influences are magnified such that they may cause stock market boom–bubbles–bust cycles.

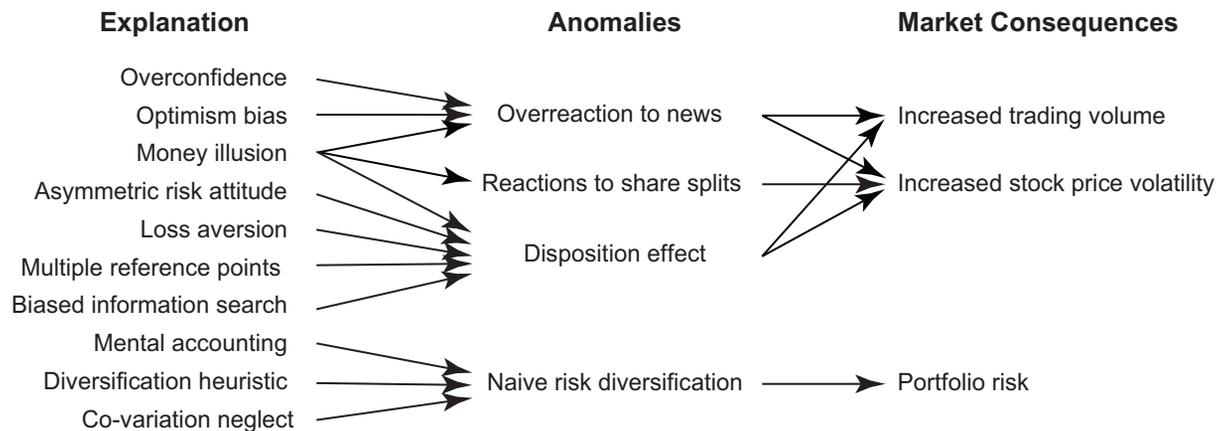
Arbitrageurs may for this reason even follow noise traders in buying stocks with increasing price trends, thereby reinforcing rather than counteracting the price trends.

Some identified market anomalies (deviations from efficient-market theory) may possibly be accounted for by psychological factors governing individual investor behavior. Providing such an account is the primary aim of research in behavioral finance (Glaser et al., 2004). In this article we likewise argue that principles validated in psychological research on judgment and decision making, reviewed in the preceding two sections, account for boundedly rational behavior in stock markets. In doing so, we propose explanations beyond investor overconfidence, which in behavioral finance is the most common explanation of market anomalies. As noted by Glaser et al. (2004), investor overconfidence has tended to become a catch-all explanation (see this reference as well as Zaleskiewicz, 2008, for a thorough discussion of how principles of overconfidence discovered in psychological research may account for market anomalies). Another reason for the dominance of a single explanation is that it is not easy to identify causes of behavior observed in actual stock markets. In contrast, laboratory experiments eliminate the confounding that plagues interpretations of market observations. Yet, laboratory experiments also raise issues of external validity. A fruitful approach would be to conduct experiments that

simulate investor behavior in actual stock markets with high fidelity (Plot & Smith, 2008).

In this section, we will highlight psychological research, in particular experimental research, that has the potential of conclusively identifying causes of stock market anomalies. Space only allows a selective review of research in behavioral finance. For comprehensive reviews, the reader is referred to DeBondt (2008), Glaser et al. (2004), and Zaleskiewicz (2008). Another valuable source is the three-volume *Behavioral Finance* (Shefrin, 2001) with reprinted benchmark papers introduced by the editor.

Figure 2 illustrates our overarching conceptualization of the role of psychological factors in stock markets. The primary focus is on individual investors who judge financial risks and make decisions to buy and sell stocks. They are guided by societal and personal value priorities. As has been shown in previous research (Schwartz, 1992), value priorities range from self-interest (self-enhancement) to collective interest (self-transcendence). In general, self-interest is assumed to be a dominant guiding principle, although it may sometimes be overridden by fairness concerns (Fehr & Schmidt, 1999; Rabin, 1993). Investors who are employed by financial institutions are furthermore primarily influenced by their employers' value priorities, even though these would differ from their personal value priorities (Nilsson, von Borgstede, & Biel, 2007). As



**Fig. 3.** Cognitive biases that explain anomalies in stock markets, and their market consequences.

we elaborate in a later section, an important question is what influences a society exerts and can exert on the value priorities of financial institutions and individual investors.

We start in the first subsection by describing a set of violations of rational investments by both expert and lay people acting in stock markets. These are identified as market anomalies<sup>5</sup> leading to excessive trading volumes and to stock price volatility not reflecting fundamental values. The violations of rational investments in single stocks include overreactions to news, the disposition effect, and reactions to splits of stock shares. Another violation is naive risk diversification of stock portfolios, leading to unintended higher portfolio risks. We review research attempting to identify cognitive biases that singly or together account for the identified violations, including overconfidence, optimism bias, money illusion, asymmetric risk attitudes, framing, loss aversion, biased information search, mental accounting, diversification heuristic, and co-variation neglect (see Fig. 3). Several of these were discussed in the preceding sections.

Some of the cognitive biases are exaggerated by affective influences on investors that will be reviewed in the second subsection.

Common cognitive biases and affective influences may go some way toward accounting for that market booms become bubbles that result in busts. These effects are reinforced by social influence—that is, the influence investors exert on each other, a phenomenon referred to as herding. In the third and last subsection, we review research on social influence in stock markets.

### Cognitive biases

**Overreactions to news.** In efficient-market theory, news is assumed to be the only factor affecting stock prices (cf. endnote 4). Bad news includes falling stock prices; negative company financial reports (also referred to as “fundamentals”); financial crises in other markets (e.g., the credit and housing markets); and events such as strikes, wars, and disasters that threaten the world economy. Good news includes rising stock prices,

positive company financial reports, and new technologies and other factors that lead to expectations of expansion of the world economy. Research has attempted to empirically verify from market observations that investors overreact to such news.

One type of overreaction is the extrapolation of price movements. Empirical evidence supports that extrapolation is an overreaction because, in general, increasing or decreasing stock prices revert back (referred to as “mean reversion”). For instance, DeBontdt and Thaler (1985, 1987) found that the future performance of stocks that previously had been extreme losers exceeded performance of stocks that in that same period had been extreme winners. Odean (1999) argues that because investors act as if they extrapolate a positive price trend by overbuying winners and overselling losers, they maintain the price trend for some time. Trend extrapolation thus becomes a self-fulfilling prophecy. Contrary to many investors’ (and probably most others’) beliefs, it is not possible to forecast how long a trend will remain. In an investment experiment employing MBA students, Moore, Kurtzberg, Fox, and Bazerman (1999) found that overconfidence and false optimism caused participants to overpredict the rise of their portfolios. In addition, their memory for past performance was optimistically biased.

Shleifer (2000) summarizes evidence showing that overreaction to news is frequently preceded by underreaction. Bayes’ rule prescribes how beliefs (e.g., about future stock prices) should be changed given the diagnostic value of new information. However, it has been found in psychological research (Edwards, 1968) that people change their beliefs less than they should. This is referred to as non-Bayesian conservatism and is invoked by Shleifer (2000) as the explanation for underreaction.

Andreasson (1988, 1990) notes that news causes old information to be temporarily underweighted. The consequence is that stock prices will deviate from a trend, going up when news is good and down when news is bad, and later reverting back when it is understood that the deviations resulted from overreaction. Andreasson hypothesized that investors make forecasts on the basis of stock prices. They place different

weights on the most recent stock price, which is assumed to reflect new information, and the average of prior prices, which in turn is assumed to reflect old information. The relative weight placed on the new information depends on several factors including the trustworthiness of the source. Another factor that has an impact is the investors' model of the process generating the price changes. Andreasson (1988, 1990) also presents experimental evidence questioning the generality of the overreaction-to-news effect. News does not necessarily make investors ignore trends in stock prices. To have an impact, news also needs to be salient.

In additional research, Schachter, Hood, Andreasson, and Gerin (1986) show that volatility in stock prices depends not only on economic events (i.e., extrapolation of price trends) but on news about other events with potential effects on the real economy, including outcomes of political elections, disasters, and so on. The more destabilized the stock market, the more investors tend to be influenced by such external events. This appears to be true for professional as well as lay investors.

Experiments reported by Svedsäter, Gamble, and Gärling (2007) demonstrate that the money illusion (Fehr & Tyran, 2001; Shafir et al., 1997) also plays a role in overreaction to news. In one experiment, it was shown that participants (undergraduates) holding shares with nominally larger prices expected higher percentage changes of the share prices when facing good or bad news about a company's performance (50% profit increase or decrease) than did participants holding shares with nominally smaller prices. In a second experiment, the same results were obtained if the share prices were expressed in the nominally larger Swedish crown than in the euro.

**Disposition effect.** Selling losers and buying winners is referred to as a momentum investment strategy (Hong & Stein, 1999). This strategy is believed to outperform the contrarian investment strategy—that is, selling winners and buying losers. Yet, investors will be “disposed” to sell winners too soon and hold losers too long. Shefrin and Statman (1985) accordingly labelled this the disposition effect.

Odean (1998) and Barber, Odean, and Zheng (2005) investigated the disposition effect in trading records. The results confirmed that losers were held too long except when selling was motivated by tax reductions (the “January effect”). Several not-fully-successful attempts were made to distinguish the disposition effect from a rationally justifiable contrarian investment strategy (i.e., believing in “mean reversion,” implying that today's losers will be tomorrow's winners).

The disposition effect has also been observed in laboratory experiments. In a computerized continuous double auction experiment in which traders exchanged two assets, Kirchler, Maciejovsky, and Weber (2005) found that when traders experienced a gain, they sold their assets earlier than they did when they experienced a loss. Weber and Camerer (1998) reported another laboratory experiment in which participants sold fictitious stock shares in several periods. They derived hypotheses

about the disposition effect from prospect theory (Kahneman & Tversky, 1979). Accordingly, investors would be risk averse when selling winners—preferring a certain gain (selling the stock) to an uncertain gain (holding the stock)—but risk seeking when selling losers—preferring an uncertain loss (holding the stock) to a certain loss (selling the stock). Prospect theory also predicts that the latter effect is stronger since losses are disliked more than gains are liked (loss aversion). The results were consistent with the disposition effect in that winners were sold too early (risk aversion) and losers too late (risk taking and loss aversion).

Weber and Camerer (1998) also found that the disposition effect was eliminated if after each period participants were forced to sell the shares they owned and then given the opportunity to buy them back at the same price for which they were sold. The disposition effect thus reflected sellers' reluctance to sell rather than a preference for buying losers. A similar qualification of the disposition effect was made by Svedsäter, Karlsson, and Gärling (2009). Even though investors in stock markets both sell and buy stocks, their role as sellers must be distinguished from their role as buyers. Since investors extrapolate trends in stock prices (Andreasson, 1988, 1990; DeBondt, 1993), when buying stocks they are likely to follow a momentum investment strategy and buy winners. It is in their role as sellers that they sell winners too early and hold losers too long. In the experiments by Svedsäter et al. (2009), in which participants either were sellers or buyers of stock shares, the disposition effect was observed for sellers while buyers followed a momentum investment strategy.

When searching information about changes in stock prices, investors are biased in a way that reinforces the disposition effect. By analyzing data on investors' choices to access stock share prices, Karlsson, Loewenstein, and Seppi (2009) observed the “ostrich effect”—that is, that investors want to avoid negative information. Given bad or ambiguous aggregated information about the development of the stock market, investors shield themselves from additional bad news by not searching for additional information about stock prices. In contrast, if the news is favorable they search for definite information.

In analyses of the disposition effect (e.g., Odean, 1998; Shefrin & Statman, 1985), it is assumed that losses and gains depend on the difference between the selling price and the purchase price of the stock shares. The purchase price is thus the reference point deducted from the selling price in evaluations of the monetary value of a trade. According to prospect theory (Kahneman & Tversky, 1979), if another reference point is adopted, this would lead to the monetary value of the trade being framed as a larger or smaller gain or loss, or as a loss instead of a gain or vice versa.

In general, the memory trace of a reference point such as the purchase price fades over time. When this occurs, another more salient price will become the new reference point. In a market with volatile stock prices, a given price may thus be perceived as a loss or a gain depending on which previous price has been adopted as the reference point. The reference point may also be

a future expected or aspiration (hoped-for) selling price. As a consequence, both historical and future reference points may coexist, causing ambivalence (Kahneman, 1992). Assume that an investor invests \$10,000 (purchase price) and hopes to sell for twice this sum although would accept \$18,000 (i.e., two different aspiration prices). The investor expects to sell at \$16,000 and has on similar occasions in the past sold at \$14,000 (historical price). If the selling price turns out to be \$12,000, this is obviously a gain compared to the purchase price but a loss compared to the other potential reference points. Will an average of these different reference points become the reference point, possibly weighted by salience? In the experiment by Weber and Camerer (1998) described previously, an average price in the preceding period of the experiment, differing from the initial purchase price, was shown to act as the reference point.

When adopting historical (purchase price) or future (aspiration price) reference points, investors should take into account changes in the value of money over time (i.e., inflation), in order to correctly infer the value of the trade. As noted in the preceding section when we discussed the money illusion (e.g., Fehr & Tyran, 2001; Shafir et al., 1997), unless inflation is very high, the nominal representation of money has such a strong influence that inflation tends to be neglected. Empirical research (Ranyard et al., 2008) also shows that inflation is frequently misperceived.

Stock prices either increase (show positive serial correlations) or decrease (show negative serial correlations) over time (e.g., Barberis, Shleifer, & Vishny, 1998). The momentum investment strategy is implied by positive serial correlations found in the shorter run (typically between 3 and 12 months), whereas the disposition effect is implied by the negative serial correlations observed over longer time horizons (DeBondt & Thaler, 1985, 1987; Shefrin & Statman, 1985). As noted by Svedsäter et al. (2009), these findings may result from buyers' expectations about increases in stock prices that are positively correlated with information about their latest, short-term development, at the same time as potential sellers, due to loss aversion and some benchmark defining an acceptable return, are less willing to sell when the current price is lower than previous prices. As a consequence, investors appear to be influenced by different reference points depending on whether they are buyers or sellers.

The disposition effect would increase trading volumes in (bullish) stock markets with rising prices since investors oversell winners (Weber & Camerer, 1998). In (bearish) stock markets with falling prices, the trading volume should decrease since investors hold losers. Yet, there is a limit to how long losers will be held given the attractiveness under such circumstance to invest in risk-free bonds. At some point in time, investors therefore decide to sell losers. Crashes are then likely to materialize due to stock prices starting to fall in uncontrolled ways.

**Reactions to splits of stock shares.** It is not uncommon after a sustained rise or fall of prices of stocks in companies that those

companies use splits or reverse splits of their stock shares to restore the nominal value of fixed lots of trading. Instead of changing the number of shares that a fixed lot contains, which is typically used as the unit of trading, a more common procedure is to change the price of the share itself. In this way, the real value of the stock is not altered, as the owners will receive proportionally more (or less) shares for a given invested sum of money. A split or a reverse split should therefore not cause changes in share prices. Yet there is a tendency for these to go up following a split and go down following a reverse split (Ikenberry, Rankine, & Stice, 1996). Thus, only changing the nominal value of share prices appears to make buying or selling these stocks attractive.

Several explanations of the effects of splits and reverse splits that maintain that investors are rational have been proposed. The "signaling" explanation by Brennan and Copeland (1988) suggests that splits convey information about the future value of a company. The "trading-range" explanation (e.g., Baker & Phillips, 1994) links splits to past rather than to future performance by positing that the changes in share values improve liquidity. Despite some studies demonstrating that the above explanations are viable, overall the results do not conclusively rule out alternative hypotheses. For example, Ikenberry et al. (1996) showed that market responses occur both in conjunction with split announcements and on the actual day of a split's implementation. According to the signaling explanation, one would expect the change in share prices to occur immediately after the announcement. If one instead considers the trading-range explanation, in order for a real price increase to occur following a split, buyers would be more influenced by an increased liquidity than would sellers.

Svedsäter et al. (2007) performed an experiment that examined whether after a split or a reverse split the change in nominal representation of share prices would affect fictitious buying or selling of stock shares. This possibility was suggested as, in line with the money illusion (Fehr & Tyran, 2001; Shafir et al., 1997), the nominal representation of money influences people's perception of money's real value. It was accordingly hypothesized that a split or a reverse split would affect trading, reflected in the participants' willingness to buy or sell. As a result of the changed nominal representation following a split or reverse split, buyers would perceive the share prices to be cheaper or more expensive, respectively. It is not clear, however, whether this leads to a higher or lower willingness to buy. A momentum investment strategy (Hong & Stein, 1999) would make investors less inclined to buy shares that have a lower value and more inclined to buy shares that have a higher value. If influenced by the disposition effect (Shefrin & Statman, 1985), sellers would, after a split, be unwilling to sell at share prices that are perceived as losses. After a reversed split, they would be willing to sell to receive the gain. The results showed that both sellers and buyers were influenced by the nominal representation of the share prices in perceiving stock values to be lower after a split and higher after a reverse split. For both sellers and buyers, this led to an increase in willingness to trade.

**Naive risk diversification.** Investors construct stock portfolios by buying stocks in different companies. Their goal is to diversify risk—that is, to avoid placing all their eggs in the same basket. Risk is defined as volatility of stock returns.<sup>6</sup> A stock with high volatility increases the probability of large gains but also the probability of large losses, compared to a stock with low volatility. An optimal portfolio should maximize return for a chosen risk level (Markowitz, 1959). An important factor to take into account is how stock returns are expected to covary (i.e., increase or decrease at the same time) in the future. Risk is reduced in a portfolio by selecting different stocks whose returns do not covary.

Behavioral portfolio theory (Shefrin & Statman, 2000) makes assumptions about investors' behavior that are claimed to be consistent with behavioral principles of judgment and decision making. The theory also applies to decisions about how many resources should be allocated to risk-free investment alternatives (bonds) and risky ones (stocks). Drawing on Lopes (1987), who conjectured that the hope of gaining and the fear of losing act as motives for investors, it is hypothesized that resources needed for subsistence are first allocated to risk-free investments (referred to as a “safety-first” strategy); then, an aspiration to increase wealth above the poverty level motivates investments in stock portfolios.

Empirical studies (Benartzi & Thaler, 2001; Hedesström, Svedsäter, & Gärling, 2004, 2007) show that in pension schemes in which citizens choose between bonds and stock funds and between different stock funds, people tend to allocate equal amounts to the alternatives offered. This is referred to as the  $1/n$  heuristic, and it is confirmed by experiments varying the number of investment alternatives. Reviewing studies covering a wide range of domains, Fox, Bardolet, and Lieb (2005) likewise conclude that when people allocate resources to a fixed set of options, they tend to use a “maximum entropy” heuristic—that is, they distribute the resource evenly across all options, insufficiently adjusting their allocations in accordance with their beliefs and preferences. In a series of experiments, Fox, Ratner, and Lieb (2005) demonstrated how allocations consequently tend to vary systematically with how options (or sets of options) are partitioned. High levels of expertise, motivation, or confidence moderate the extent to which people exhibit “partition dependence.”

In one version of behavioral portfolio theory (Shefrin & Statman, 2000)—proposed to account for portfolio construction—the covariation among stock returns over time is taken into account. In another version of the theory, the tenet is that investors segregate their portfolios in several layers, also referred to as mental accounts (Thaler, 1999), that consist of stocks varying from high to low risk. In the simplest case, there are only two layers, one with stocks selected with the aspiration of avoiding poverty (fear of losing) and the other selected with the aspiration of becoming wealthy (hope of gaining). By segregating the investments in layers of stocks, covariation among stock returns is neglected. As an illustration, investors frequently select domestic rather than foreign stocks for their portfolios, believing this incurs less risk (French & Poterba,

1991). Yet this “home bias” neglects that domestic stock returns are more likely to covary in the future than are domestic and foreign stock returns.

It has been argued that people have a general tendency to seek variety (Scitovsky, 1976). An important reason noted by Simonson (1990) is that they are uncertain about their future preferences. Consumer studies using snacks and lottery tickets have shown that a variety-inducing diversification heuristic leads to suboptimal choices (see, e.g., Read & Loewenstein, 1995)—for instance, people who are offered several items choose different snacks instead of choosing only the snack they like best. In an investment context, on the other hand, the consequences of variety seeking are not necessarily negative, as more diversification is often better than less diversification (Read, Antonides, van den Ouden, & Trienekens, 2001).

Although using a diversification heuristic when constructing stock portfolios creates variety among the stocks, the use of the heuristic may not reduce risk to the extent that investors intend, because the covariation among the expected stock returns is neglected. Investors may thus not fully understand why diversification reduces portfolio risk and may incorrectly believe that any multiple-stock portfolio, irrespective of its covariance structure, will be risk diversified. This is possibly attributable to a generally poor grasp of the concept of covariation. The human capacity to assess covariation has been extensively investigated in judgment and decision-making research (see Shanks, 2004, for a review). Consistent findings demonstrate that people act naively when computing covariation (typically between discrete variables presented in 2-by-2 contingency tables) and that judgments of covariation are strongly influenced by prior beliefs, in some cases resulting in a virtually complete lack of sensitivity to the data.

In an investment context, continuous variables (stock returns) covary. Comparatively little experimental research has investigated judgments of covariation among continuous variables. Even fewer studies have used portfolio-diversification tasks. An exception is Kroll, Levy, and Rapaport (1988), who presented three groups of undergraduates with the previous returns of three stocks, A, B, and C, and asked the participants to construct portfolios. For all three groups, the returns of stocks A and B were uncorrelated, as were the returns of stocks A and C. While the returns of stocks B and C were uncorrelated for the first group, correlations between these stocks were positive ( $r = .80$ ) for the second group and negative ( $r = -.80$ ) for the third group. If the covariance had been taken into account, allocations to each of the stocks should have differed between the groups. As no significant differences were found, it was concluded that the participants exhibited covariation neglect. However, when the experiment was repeated with business students who were subjected to a possible loss of their own money and allowed the possibility to copy each other's actions, the participants did respond adequately to changes in the correlation coefficient (Kroll & Levy, 1992).

In the Swedish Premium Pension Scheme, citizens construct their own mutual fund portfolios, and a brochure displays the funds' returns for each of the 5 preceding years. In analyzing

**Table 1.** Amount in Swedish Crowns (SEK) an Investment of SEK 10,000 Has Increased or Decreased in 10 Years Time in Five Scenarios (After Hedesström, T. M., Svedsäter, H., & Gärling, T., 2006)

	Negatively correlated returns			Positively correlated returns		
	Fund A	Fund B	A+B	Fund A	Fund B	A+B
Scenario 1	15,000	9,000	12,000	19,000	17,000	18,000
Scenario 2	13,000	10,000	11,500	15,000	14,000	14,500
Scenario 3	11,000	11,000	11,000	11,000	11,000	11,000
Scenario 4	9,000	12,000	10,500	7,000	8,000	7,500
Scenario 5	7,000	13,000	10,000	3,000	5,000	4,000

Note: The scenarios represent equally likely future outcomes of fund returns. If returns vary more (as for funds A), the risk of losing is higher than if they vary less (funds B). The returns of funds A and B either follow each other (are positively correlated) or when one goes up, the other goes down (are negatively correlated). Choosing both funds (A+B) instead of fund B reduces risk when the returns are negatively correlated but increases risk when they are positively correlated.

actual as well as fictitious investment choices, Hedesström et al. (2004, 2007) found indications of naive risk diversification, calling into question investors' ability to take into account covariation among returns. The typical choice (among those who did not choose a default fund) was to include as many funds as possible (five) in the portfolio. Regardless of how many funds were chosen, the most typical selection was a set of funds that belonged to different categories and that had different fund managers. This extensive diversification may partly be attributable to advice from responsible authorities and financial agents. It may also be a consequence of the use of the diversification heuristic.

The key issue is whether citizens in general manage to diversify in a manner that effectively reduces the risk of their investments in pension schemes by taking covariation of stock returns into account. Although stocks from one country are likely to covary more than equivalent stocks from different countries, almost half (48.2%) of the total amount citizens invested in the Swedish Premium Pension Scheme was in Swedish stocks (Cronquist & Thaler, 2004). Thus, investors may have failed to realize that diversifying across funds in Sweden does not reduce risk as effectively as diversifying across funds in a range of countries. There are also other examples of covariation neglect that possibly result from a naive application of a variety-inducing diversification heuristic (Hedesström et al., 2004). For example, life-cycle funds are specifically designed for people who do not want to adjust their asset allocation from stocks to interest-bearing bonds (which is widely recommended) as retirement age approaches. This adjustment is instead made by the fund manager. Because life-cycle funds are risk diversified, it is difficult to conceive of any good reasons to combine such funds with other funds. Nevertheless, it was not unusual that this type of fund was combined with stock funds, interest funds, or mixed stock and interest funds, which were the three other salient subgroups of funds.

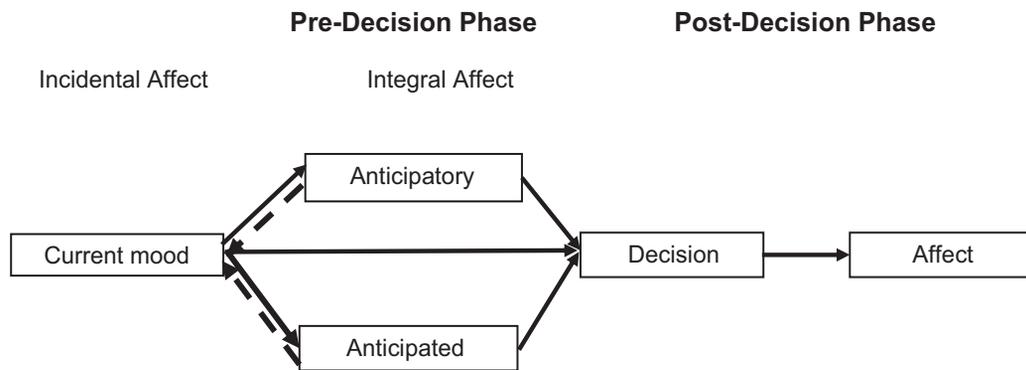
Hedesström, Svedsäter, and Gärling (2006) conducted an experiment to disentangle the possible causes of covariation neglect in fund investments. Undergraduates from various programs participated in return for a flat monetary compensation. As Table 1 illustrates, the participants were presented five equally probable fund<sup>7</sup> returns in 10 years time on investments of 10,000 Swedish Crowns (about US \$700). For one more

risky fund (A), the returns were more volatile than they were for another, less risky fund (B). The expected mean returns were the same. In one within-group condition, the fund returns were negatively correlated, and in another they were positively correlated. The participants were asked to first choose to invest in one of the positively (or negatively) correlated funds; then, after having performed a distracting task, they were asked to choose to invest in one of the negatively (or positively) correlated funds. They also had the choice to diversify—that is, to allocate half the amount to one fund and the other half to the other fund. There were five different instructions given to different groups. In one group, no goal of the investment was specified, whereas in the other groups, the goal was stated to be to minimize risk. By specifying risk minimization as a goal, naive risk diversification (diversifying in both choices) decreased from 37.5% to an average of 20.3% at the same time as effective risk diversification (choosing the low-risk fund when the returns were positively correlated, diversifying when they were negatively correlated) increased from 12.5% to 54.7%. Providing general information about the role of covariation for risk diversification had the effect of increasing effective risk diversification (from 34.4% to 46.9%) and reducing naive risk diversification (from 40.6% to 18.8%). The largest effects were observed when the calculated returns for the choice of both funds (shaded columns in Table 1) were presented or when the participants were asked to make these calculations themselves. Effective risk diversification then increased to 62.5% and 75.0%, respectively, at the same time as naive risk diversification decreased to 9.4% and 12.5%, respectively.

Although the results of Hedesström et al. (2007) suggest ways of teaching effective risk diversification to naive investors—for instance, to citizens given the opportunity to invest their pension savings in stocks—people's use of the diversification heuristic should not be discouraged. Covariation among future stock returns is difficult to forecast. Therefore, diversification that does not take covariation into account is still better than no diversification (Read et al., 2001).

### **Affective influences**

As illustrated in Figure 4, judgment and decision making are influenced by predecisional affective states such as current



**Fig 4.** Affective influences on decisions in stock markets. Current mood that is unrelated to the decision may have effects on the decision making in the predecisional phase that are referred to as incidental; integral affects related to the decision making task are either anticipatory affect or anticipations of the affect outcome of the decision in the postdecision phase.

mood (referred to as incidental affective influences—that is, affect unrelated to but experienced while making a judgment or decision), anticipatory affect (e.g., dread, optimism–pessimism), and anticipated affect associated with the decision outcome (e.g., elation, disappointment, and regret—and referred to as integral affective influences; Peters, Västfjäll, Gärling, & Slovic, 2006).

Current mood is commonly conceptualized as a nontransient discrete affective state varying in two orthogonal dimensions (Russell, 2003; Russell & Feldman Barret, 1999; Yik, Russell, & Feldman Barret, 1999): (a) valence that varies from positive to negative and (b) activation that varies from activated to deactivated. For instance, elation is an affect high on valence and activation, disappointment an affect low on valence and activation. Influences of current mood on judgment and decision making have been amply documented (see Isen, 2000, for a review). This research shows that a current mood high on valence and low on activation (i.e., “relaxed”) induces a less-thorough decision making process than does a current mood low on valence and high on activation (i.e., “distressed”; Schwarz, 2000). A worse outcome results if the decision would have benefitted from more thorough processing of the available information. On the basis of the “feeling as information” theoretical framework (Schwarz, 2001), it may be argued that the current mood signals whether or not such thorough processing is required.

Are investors in stock markets influenced by their current mood? Some studies have empirically found that factors known or assumed to affect current mood (e.g., temperature, sunny or cloudy weather, changes of season, time of day) correlate with stock returns in the expected direction (Dowling & Lucey, 2005; Nofsinger, 2005). For instance, in one study (Hirshleifer & Shumway, 2003) replicating some previous research, a negative relationship between cloudy weather and stock returns was observed in a majority of 26 international stock markets.

Other effects of current mood on judgment and decision making may be viewed as mood regulation (Rusting, 1998)—that is, maintaining a positive mood or repairing a negative

mood—which is an important purpose of some of people’s actions. Substantial evidence from research by Isen and collaborators (summarized in Isen, 2000) shows that people in a positive mood are risk averse because they do not want a negative decision outcome (e.g., loss of money on a risky stock investment) to destroy their positive mood. Sometimes counteracting this, a positive mood also increases optimism (e.g., Johnson & Tversky, 1983). Conversely, people in a negative mood tend to take more risks (Mano, 1992), possibly because they want a positive outcome to repair their negative mood. The disposition effect observed in stock markets (Shefrin & Statman, 1985) implies that prior losses result in risk seeking (keeping losers) while prior gains result in risk aversion (selling winners). If prior losses induce a negative mood and prior gains a positive mood, the disposition effect is consistent with the previous research on mood effects (Isen, 2000).

There may also be other influences of current mood on stock investments. Such influences may be integral, including anticipated negative affect associated with losers and positive affect associated with winners. Still another possibility is that integral anticipatory affect has an impact. As suggested by Nofsinger (2005), rising or falling stock prices in the market or other events influencing the global economy may give rise to anticipatory affects of hope, fear, or even despair that influence stock investments. Mood regulation is still the driver of the affective influences, as selling winners would repair a negative mood or amplify a positive mood, whereas keeping losers would prevent destroying a positive mood or amplifying a negative mood.

With the aim of demonstrating the role of mood regulation on selling stocks, Piñón and Gärling (2004) conducted experiments in which pictures selected from the International Affective Picture System (IAPS; Bradley & Lang, 1999) were presented to different groups of undergraduates to induce a positive or negative mood for the same activation level. The picture shown to the participants in the positive-mood condition displayed three cuddly puppies, whereas the picture shown to the participants in the negative mood condition displayed a crying, undernourished child. Participants chose between selling

or keeping a stock. Given a prior loss on the stock, one may adopt a reference point taking this into account (a loss frame) or ignore the prior loss (adopting a gain frame). It was expected and found that, in a positive mood, the participants ignored the prior loss, adopted the gain frame, and chose to sell, whereas in a negative mood, the participants took into account the prior loss, adopted a loss frame, and chose not to sell. Thus, the disposition effect (keeping losers) was observed only when participants were in a negative mood. The general implication is that the disposition effect is related to both incidental and integral affects.<sup>8</sup>

This interpretation of the results was however challenged by another experiment. Other groups of undergraduates were asked to not sell or to keep a stock at a loss after they had earned money on other stocks. Taking the previous gain into account, they would come out in the black even though they decided to sell the stock at a loss. If mood regulation accounted for the previous results, one would thus expect the prior gains not to be ignored in a positive mood (adopting a gain frame). However, no effect of positive mood was observed. A proposed alternative explanation is based on the finding that a positive mood induces less-thorough information processing than does a negative mood (Schwarz, 2000). Also drawing on the analysis of mood regulation by Erber, Erber, and Poe (2004), mood regulation in a positive mood is hypothesized to involve selective attention, requiring minimal information processing and resulting in ignorance of any prior event, thus leading an individual to adopt either the gain or loss frames induced by the current choice. In contrast, a negative mood is hypothesized to induce reappraisals requiring systematic processing of available information.

An affective dimension<sup>9</sup> varying from elation to disappointment is frequently used to characterize affect outcomes of decisions (Mellers, 2000). Previous research (Zeelenberg, 1999) has shown that a negative outcome of a chosen alternative causes disappointment, whereas a positive outcome of a non-chosen alternative causes regret at not having chosen that alternative. Västfjäll, Gärling, and Kleiner (2004) conceived of the anticipated affect of a decision as a cognitive representation of valence and activation of affect experienced as a result of the decision outcome. Anticipated affect was assumed to frequently play an important role, in particular when cost–benefit considerations are deemphasized. The implication is that anticipated affect functions as a heuristic that simplifies choices. Such an affect heuristic may be triggered by certain types of decision outcome (e.g., romantic vs. monetary outcomes, Rottenstreich & Hsee, 2001), time pressure, inaccessible information, or, generally, demands that overtax cognitive capacity (Finucane, Alhakami, Slovic, & Johnson, 2000). Importantly in the context of stock markets, Västfjäll and Gärling (2002) showed that choices between lotteries with monetary outcomes will also entail anticipated affect. Specifically, positive versus negative affect was related to the sign (gain or loss) and magnitude of an expected monetary decision outcome. Activation of the anticipated affect increased with the probability of the decision outcome. Thus, when the probability

of the decision outcome increased, anticipated pleasure from a gain was boosted and resulted in elation, whereas anticipated displeasure from a loss was amplified and resulted in disappointment.

What role does anticipated affect play in stock investments? In an experiment conducted by MacGregor, Slovic, Dreman, and Berry (2000), a sample of undergraduates taking a course in investment banking was first asked to rate industrial sectors with respect to several attributes reflecting associated positive versus negative affect. Participants were also asked to similarly rate images aroused by thinking about the industrial sectors. It was found that some industrial sectors elicited strong positive or negative affect. Participants were more likely to buy stocks in those industrial sectors eliciting strong positive affect than in those eliciting strong negative affect. They predicted that the financial performance of the purchased stocks would be better, but this prediction was not borne out by analyses of market data. This suggests that knowledge of the stock companies was poor. Affect images may thus still play a limited role in actual stock markets if investors have knowledge of the stocks they buy. In a similar vein, Finucane et al. (2000) demonstrated a negative correlation between judgments of benefits and judgments of risks made under time pressure. The correlation is generally expected to be positive—that is, benefits would be expected to increase with increasing risk—which was the case when there was no time pressure and participants were able to access relevant information.

## Social influences

If some investors start to buy stocks in a given company or industry sector, other investors may follow them and buy the same stocks—a phenomenon referred to as herding. Sias (2004) defines herding as investors' tendency to follow each other in buying and selling stocks. He further notes that herding exists both for individual and institutional investors.

Although implied by the definition that herding is equivalent to imitating others, it is important to note that social influences by others may also be indirect. Four main causes of indirect social influence have been proposed in previous research: common knowledge, fads, common investment strategies, and similar compensation schemes. Common knowledge has an influence when investors, independently of each other, use the same information (Froot, Scharfstein, & Stein, 1992; Grinblatt, Titman, & Wermers, 1995). Evidence of fads is that investors buy the same popular stocks (Sias, 2004). Many investors may also systematically follow the same investment strategy—for instance, momentum (Wermers, 2000). Investment firms' schemes for compensating their employed investors frequently reward performance relative to that of others, and therefore the investors may earn less if deviating from a market index (Rajan, 1994).

Herding due to direct influences from other investors is believed to arise from “information cascades”—wherein investors, independently of their private information, make choices based on the observations of choices made by others

preceding them (Bikhchandani, Hirshleifer, & Welch, 1992)—or “reputational herding”—wherein investors make choices that conform to those of others lest they impair their own reputation by deviating (Scharfstein & Stein, 1990). The possible causes of herding are not mutually exclusive; investors may herd for several reasons at the same time.

The issues addressed by research are whether herding exists, whether herding is rational or irrational, and what causes herding. On the first issue, no definite consensus has been reached in research based on analyses of investor behavior in stock markets (see the review by Hirshleifer & Teoh, 2003).<sup>10</sup> While some studies confirm the existence of herding (e.g., Guedj & Bouchaud, 2005; Sias, 2004), others do not (e.g., Drehmann, Oechssler, & Roeder, 2005; Grinblatt et al., 1995; Lakonishok, Shleifer, & Vishny, 1992; Wermers, 1999). The different results can partly be explained by how herding has been measured. One common measure was developed by Lakonishok et al. (1992) based on the assumption that large imbalances between the number of buyers and sellers of stocks are evidence of herding. Studies applying this measure (Grinblatt et al., 1995; Wermers, 1999) show a lower level of herding than do studies applying other measures (Bennett, Sias, & Starks, 2003; Nofsinger & Sias, 1999).

Experiments (e.g., Anderson & Holt, 1997; Celen & Kariv, 2004) show more clearly that information provided by others' actions is utilized. Whether this is rational or not is debated. One argument for rationality is that others' actions convey useful information, either because the others have more knowledge or simply because they are members of a crowd. The “wisdom of the crowd” (Surowiecki, 2004) refers to the statistical fact that under conditions of independent random sampling, an aggregate collective judgment is more accurate than individual judgments are. An empirical illustration is an experiment by Treynor (1987) in which participants made independent judgments of the number of jelly beans in a jar. The jar had 850 jelly beans. The aggregate group estimate was 871, and only one of the 56 participants made a better judgment. Thus, as would be expected, a combined judgment by a group outperforms that of the average individual (Larrick & Soll, 2006). In order to characterize a crowd as “wise,” each person in the crowd must possess unbiased independent information and each judgment must be made independently. If the individual judgments are aggregated by giving each equal weight, then unsystematic errors will cancel. In a similar vein, independent unbiased judgments by investors would yield stock prices close to the stocks' fundamental values. It is also important to realize that accuracy of aggregated judgments will increase with group size (although at a decelerating rate). Imagine that only three people participated in the jelly-bean experiment. Adding a fourth would obviously have a large influence on the aggregated judgment. In contrast, the judgment by another participant would have little influence on the aggregated judgment of an already large group.

Information cascades start in stock markets when investors ignore their private information and imitate others (Smith & Sørensen, 2000). An everyday illustration of an information cascade is given by Shiller (2000). Imagine that a person

chooses between two unfamiliar, apparently similar restaurants situated on each side of a street. The person has received mixed evaluations by others about one of the restaurants (*A*) and good evaluations about the other (*B*). When approaching the restaurants, the person notes that restaurant *A* is more crowded than restaurant *B*. For this reason he or she ignores the private information about the evaluations and chooses the same restaurants as the others.

A typical experimental paradigm for investigating information cascades (e.g., Anderson & Holt, 1997) is to have participants predict which of two events (*A* or *B*) would take place. On each trial, participants receive one of two cues, *a* or *b*, that have a predetermined non-zero probability of leading to events *A* and *B*, respectively. The cue is private but the prediction of *A* or *B* is publicly announced; thus participants on each trial receive information about their private cue (*a* or *b*) and the decisions made by the preceding participants (*A* or *B*). An information cascade occurs when a participant observes two consecutive predictions of *A* and, despite contrary private information (*b*), predicts the same option chosen by the others (i.e., *A*). Anderson and Holt (1997) found that cascades are formed when the initial decisions coincide, and they concluded that following the established pattern in such cases is consistent with normative reasoning (Bayes' rule)—that is, that beliefs are revised by the optimal use of diagnostic information. However, they also found that in about half of the cases when a cascade was observed, participants' choices were inconsistent with Bayes' rule and were thus interpreted as irrational.

In experiments demonstrating information cascades, the price of a stock share does not change with demand. Avery and Zemsky (1998) argued that if stocks with market-determined prices are chosen, information cascades cannot start. Counterarguments were presented by Chari and Koehe (2004) and SgROI (2003). Doubts about rationality of information cascades are furthermore raised by Spiwoks, Bizer, and Hein (2008), who report that only 36% of the decisions made by the participants were consistent with Bayes' rule and that only a minority of them was able to state a correct reason for their decisions.

Herding in stock markets may be explained by psychological principles of social influence. Festinger's (1954) theory of social comparison processes and the experiments by Sherif (1935) and Asch (1956) started a tradition of social-influence research. In this research, it is presumed that people in many areas of social life are influenced by others when making decisions. Such social influence is normative or informative (Bond, 2005). In the former case, the motive is to conform to others due to external social pressure or internalized norms, whereas in the latter case the motive is to acquire useful information from others. According to Shiller (2000), both types of influence exist in stock markets: informative social influence, because given the uncertainty investors face, they are likely to use many sources of information including information about others' behavior; and normative social influence, because investors frequently are agents investing money owned by others and therefore accountable to them.

Several theories of social influence have been proposed. A dominant one is Moscovici's (1985) theory, which posits that different cognitive and motivational processes account for majority and minority influences. Briefly, a majority is assumed to trigger a comparison process leading people to comply with the majority without thoroughly reflecting on its message. Since people are unwilling to be identified with deviant groups, minorities are instead assumed to trigger a validation process leading to critical evaluation of the minority members' arguments. Another reason for majority influences, consistent with the fact that social influences are informative, is that people who are uncertain about how to act use a "consensus" heuristic—an assumption that the majority is always correct (Eagly & Chaiken, 1993; Martin, Gardikiotis, & Hewstone, 2002). Conversely, a minority would not be trusted since it cannot be correct if the majority is. The consensus heuristic is sensible but would lead to errors if overgeneralized. A consequence is that herding is rational or irrational depending on the circumstances. An important factor is the ease with which accuracy of performance can be determined. In stock markets, this is generally difficult (Taleb, 2004).

Andersson (2009) and Andersson, Hedesström, and Gärling (2009) reported a series of experiments in which undergraduates were asked to make predictions of changes in fictitious stock prices that were both systematic and unsystematic. Consistent with the results of research on probabilistic inference (Cooksey, 1996), the influence on the predictions of the current stock price increased when stock prices systematically increased. For instance, an opening price of a stock that correlated with the closing price the same day was frequently used to predict the latter before it was disclosed. When a group of other people (ostensibly numbering five individuals) made predictions of the stock price that were disclosed to the participants, that group's predictions had a large influence if predictions were consistently made by a majority (four of the others making correlated predictions) but not if they were consistently made by a minority (two of the others making correlated predictions). Whether the majority made accurate or random predictions did not change its influence. Yet, if the price varied systematically so that it could be utilized to predict the stock price, majority influences tended to be reduced.

An implication is that the tendency to follow others would be the strongest in times of excessive uncertainty (high volatility of stock prices). Trends of falling or rising prices are therefore likely to be boosted in such circumstances, starting a vicious circle. Under such circumstances, the causes of herding are probably multiple and not easy to identify. Obviously, common knowledge must be discounted as a cause when uncertainty is excessive. A possibly dominant cause under these circumstances is the motivation to avoid becoming a sucker (Dawes, 1999). As Keynes (1936/1997) noted, worldly wisdom teaches that it is better for one's reputation to fail conventionally than it is to succeed unconventionally. It is likewise argued that investors who herd are able to share the blame and hide in the herd when making unfavorable investment decisions (Devenow & Welch, 1996). Along the same lines, Scharfstein

and Stein (1990) proposed that an unprofitable investment harms a decision maker considerably less when others have made similar investments, which constitutes a reputational reason for investors to ignore private information in favor of trading with the herd. Parallel to this explanation is Palley's (1995) argument that herding is based on the principle of "safety in numbers," assuming that managers are individually risk averse and that their reward is partly based on relative performance.

Empirical results are consistent with the notion that concern about reputation causes herding. Thus, younger portfolio managers deviate less from consensus than their older colleagues do, possibly because they have more at stake in terms of reputation as they face a longer working life ahead (Hong, Kubik, & Solomon, 2000). Experiments with professional stock analysts have also demonstrated reputational herding. In one study (Cote & Sanders, 1997), participants' task was to predict future returns. After each prediction, the average prediction was shown to the participants, giving them an opportunity to adjust their own predictions. The results showed that presenting the average prediction had a significant influence and that the degree of influence was related to the participants' perceptions of their own ability and motivation to create or maintain a good reputation.

Investors imitating others have been described as mindless sheep blindly following a herd, being frantic during market booms and terrified during busts (Shiller, 2000). Although the evidence from research on herding in stock markets hardly justifies the sheep metaphor, herding is likely to reinforce the cognitive biases and affective influences to which investors in stock markets are susceptible (see Fig. 2). In reinforcing such biases, herding will aggravate the stock price volatility that destabilizes the market (Bikchandani & Sharma, 2000; Chari & Kehoe, 2004).

## Summary

In this section, we demonstrated that several phenomena observed in stock markets, referred to as market anomalies (deviations from efficient-market theory in economics), may be caused by cognitive biases reinforced by affective and social influences. There are several other identified market anomalies (DeBondt, 2008). It is an open question whether the present analysis can be extended to accommodate these. Another open question is whether our proposed explanations are sufficient to account for market booms and busts. In analyzing determinants and developments of financial crises, some influential economists (Akerlof & Shiller, 2009; Galbraith, 1955/1997; Krugman, 2009) at least do not refute that psychological factors play important roles.

It may be concluded that efficient-market theory (Fama, 1970) paints a beautiful, ideal picture of the stock market, not a picture of the less beautiful reality. Since crashes on the stock market (in conjunction with crashes on the credit market) have such serious negative consequences for the real economy as well as directly or indirectly for people's well-being, future research should probably be less focused on disproving

efficient-market theory than on answering questions about what can be done to make it work in stock markets. Such research needs to highlight institutions. It is still indispensable, in evaluating institutional changes, to investigate individual investors' judgments and decision making.

## Behavior in Credit Markets

People's needs for housing and transportation, their wishes to take a vacation, or their desire to purchase clothes or jewelry may not always be possible to fulfil due to lack of money. If people do not want to postpone purchases until necessary savings have accumulated, they may decide to use credit and take the risk of indebtedness and not being able to pay their monthly installments. Credit is defined as a "system by which goods and services are provided in return for deferred rather than immediate payment" (Black, 2002, p. 99). Consumer credit is a broad term referring to "credit obtained to finance any purchase other than property" (Guardia, 2002, p. 2), comprising all kinds of installment credit (e.g., credit cards) as well as non-installment credit, with the exception of mortgage debt.

Among the driving forces of acquisition of consumer goods without having the necessary financial budget are hedonic values (Gourgé, 2001) and an increase in present-time orientation (Wood, 1998). Postmodern societies have supported the rise of compulsive consumption (Neuner, Raab, & Reisch, 2005; Tokunaga, 1993), facilitated by increasing availability of credit. Using a loan to buy a property appears to be completely sensible and desirable from the perspective of national economies since it stimulates consumption and business. However, a loan is simply another form of debt, which can lead to overindebtedness and thus to serious problems in the household. Credit use and mortgages can also lead to serious problems in financial markets and national economies, as the subprime mortgage crisis that became apparent in late 2007 and 2008 shows (Krugman, 2009).

Global credit excesses attest to credit lenders' share in contributing to households' indebtedness; lenders do this by increasingly offering loans without appropriately considering the risk borrowers will not be able to pay their monthly installments. With regard to the current subprime mortgage crisis in particular (Krugman, 2009), government policies and competitive pressure encouraged high-risk lending practices and a long-term trend of rising housing prices that encouraged borrowers to believe in easy credit payback.

In this section, we focus on people's readiness to borrow money and processes involved in decisions to take up credit, as well as on experiences with credit payback.

### Credit use and debt

The preparedness to use credit and to take the risk of indebtedness is increasing; so is household bankruptcy as a result of growing consumer credit use. In the United States, household debt is high (e.g., Maki, 1999; Zhao, 2003), while fewer people possess savings accounts (Merskin, 1998). In France, the

United Kingdom, and Germany, the volume of outstanding consumer credit has doubled between 1990 and 2003 (Brown, Taylor, & Wheatley Price, 2005; COFIDIS, 2004). In the new member states of the European Union (EU), citizens having a desire for a Western living standard are increasingly ready to use credit (Babeau, Pioneer Investments, & Unicredit New Europe Research Network, 2004).

Credit use has become socially acceptable (Merskin, 1998; Watkins, 2000), and people rely more on borrowing money (Estelami, 2001). The largest component of consumer credit is automobile financing (e.g., Courtless, 1993). Whereas a car can be perceived as a necessary good, credit use no longer means investing predominantly in necessary goods and in the personal future; it has become an acceptable means of acquiring luxury products (e.g., Livingstone & Lunt, 1992; Norton, 1993). People not only are prepared to use credit for buying a car or an apartment or a house, they also think that the bank "could pay first" for a vacation trip, jewelry, or furs. The famous quote by journalist Earl Wilson (1907–1987) describes this reality: "Modern man drives a mortgaged car over a bond-financed highway on credit-card gas," and the proverb "Better to go to bed hungry than to wake up in debt" sounds obsolete. In a culture of consumerism and an economy based on immediate gratification, people are saving less and spending more even if they need to borrow the money. Indeed, "Nowadays people can be divided into three classes—the haves, the have-nots, and the have-not-paid-for-what-they-haves."

Different sources of credit are used for different purposes (Berthoud & Kempson, 1992). Credit cards or store cards are the most common sources of consumer credit, accounting for about 10% of total household debts (Christen & Morgan, 2005), followed by bank overdrafts, loans from friends or relatives, bank loans, mail-order catalogues, and financing by other companies (Berthoud & Kempson, 1992; Livingstone & Lunt, 1992). Credit cards—including bank-issued cards, general purpose cards, store cards issued by specific retailers, travel-and-entertainment cards, and secured cards—represent a special form of credit use. That the use of credit cards as a substitute for cash and checks is convenient and important to consumers, retailers, banks, and business in general is uncontested. As Lee and Kwon (2002) report, the market share of credit cards has sharply increased in the last decades and so have people's outstanding back payments and credit card debt. Credit cards serve as both a payment means and a short-term financing instrument. The popularity of credit cards as a payment means has been attributed mainly to convenience (e.g., Durkin, 2000), to less-time-consuming shopping services (Kinsey, 1981), to their necessity for Internet transactions, and to add-on offerings, such as frequent-use awards, flight miles, and other benefits. Credit cards are also used as a medium for revolving consumer credit, which allows people to borrow within their credit limit without transaction costs. This use has mostly been observed among less-affluent people and people with positive attitudes toward borrowing money (Slocum & Mathews, 1970). The ease of revolving credit by credit cards accounts for a substantial and growing share of consumer debt (Canner & Luckett, 1992).

Credit is frequently associated with debt in people's minds. While the term credit is taken to refer to financing of necessary acquisitions, such as a home or a car, and thus has a positive connotation, Viaud and Roland-Lévy (2000) report that the term debt is used to describe borrowing money for nonessential consumer goods. Lea (1999) defines credit as deferred payment on agreed terms and distinguishes credit from debt, which is defined as buyers' deferred payment without an agreement between buyer and seller. While debt is defined as a short-term problem (Webley & Nyhus, 2008)—meaning that debtors are likely to become regular credit users within a short period of time (Canner & Luckett, 1991)—problem debt is defined as debt that is not repayable in the foreseeable future.

According to Meier and Sprenger (2007), many people have large amounts of debt. In the United States, households carry, on average, non-mortgage debt burdens of \$12,900; almost 20% of which is unsecured debt on credit cards. In the last decade, the median debt burden for credit card borrowers increased by 100 percent in nominal terms. In line with this growth is an increase in the number of people seeking credit counseling—a possible indication that many individuals see their own level of debt as suboptimal.

Debt incurs not only direct costs but also indirect personal, emotional, and psychological costs (e.g., DeVaney & Lytton, 1995; O'Neill, 1995). Debt has also been found to be associated with high levels of psychological distress. For instance, Brown, Taylor, and Wheatley Price (2005) found that households with outstanding credit are likely to report lower levels of psychological well-being than are households without debt, and indebted students report poorer psychological well-being (Roberts, Golding, & Towell, 1998; Stradling, 2001). The burden of financial strain can also be associated with mental disorders (Weich & Lewis, 1998), health problems (Drentea & Lavrakas, 2000), and marital conflict (Jeffrey, 2007).

Credit use has become a topic of interest in economics, particularly because it covaries with interest rates and household income. Neoclassical economics tries to integrate credit use into standard economic theory (e.g., Brito & Hartley, 1995) by conceptualizing it as maximizing utility by consuming in advance (e.g., Modigliani, 1966, 1986). Neoclassical economics largely ignores the types of credit used, personal characteristics of credit takers, and situational circumstances (Frederick et al., 2002); this is in contrast to the economic-psychological research (e.g., Hayhoe, Leach, & Turner, 1999; Qi & Yang, 2003; Xiao, Noring, & Anderson, 1995), which has predominantly focused on subjective concepts of credit (e.g., Ranyard & Craig, 1995), individual characteristics of credit users (e.g., Webley & Nyhus, 2001), excessive use of credit (e.g., Lea, Webley, & Levine, 1993), and compulsive buying related to credit use and indebtedness (e.g., Dittmar, 2000; Dittmar & Drury, 2000; Hanley & Wilhelm, 1992).

The smaller the loan and the higher the existing debts, the more likely people are to use a high-rate credit source like a financing company (Dreznik Worden & Sullivan, 1987). The most important predictor of which source of credit will be used is people's income (Berthoud & Kempson, 1992). While

middle-income groups frequently use mainstream commercial credit (e.g., bank overdrafts, bank loans) to borrow high amounts, low-income groups frequently borrow small amounts from the alternative credit market at high interest rates (e.g., pawnbrokers) or from relatives and friends (e.g., Croden, 2000). Credit behavior of low-income homeowners resembles that of high-income groups. High-income groups primarily use credit cards, overdrafts, and bank loans, whereas low-income groups rely mainly on loans from financing companies and relatives or friends (Bridges & Disney, 2004). In a study comparing people with small debts to people with serious debts, it was found that personal debt correlated with the financial poverty of those affected (Lea et al., 1993). Reasons for excessive credit use and indebtedness are thus believed to be predominantly low income and poverty.

Also, irresponsible purchases and inadequate budgeting of income are identified as sources of excessive spending and indebtedness. Low willpower and lack of self-control techniques that would reduce immediate satisfaction of needs and to overcome temptation of immediate purchases are possibly important additional determinants of indebtedness (Hoch & Loewenstein, 1991; Karlsson, 2003; Shefrin & Thaler, 1988). Anticipation, self-control, and self-representation play an important role in people's ability to postpone a purchase or override their temptation to buy immediately. As Berns, Laibson, and Loewenstein (2007) note, intertemporal choices are influenced by individuals' propensity to imagine and experience future pleasure and pain, by their experienced tensions when they attempt to implement a far-sighted decision in the presence of immediate temptation, and by the way they interpret or frame a set of choices.

In a study of differences between people without loan debts and those who were having to make loan repayments, Livingstone and Lunt (1992) found that young people, people with a positive attitude toward using credit, and those who experienced consumption as a form of reward were more likely to be in debt. The level of debt was dependent on the level of income, on other socio-demographic factors, and on psychological factors.

Wang and Xiao (2009) examined college students' credit card indebtedness and found that their buying patterns and social networks affected indebtedness. Students with a tendency toward compulsive buying—that is, chronic and repetitive purchasing that becomes a primary response to negative events or feelings (O'Guinn & Faber, 1989)—were more likely, and those with greater social support less likely, to have high debts. According to lay opinion about financial debts, individual characteristics and irresponsible purchases are the major reasons for indebtedness. Being in debt is often attributed to personal fault of the indebted people themselves rather than to situational circumstances (e.g., Roland-Lévy & Walker, 1994; Walker, 1996), or to easy access to credit due to lenders' misjudgments of borrowers' financial standing.

## **A conceptualization of credit decisions**

**Process stages.** Empirical research on credit use in economic psychology is characterized predominantly by isolated small-

scale studies usually lacking a common conceptual framework. For this reason, Kamleitner and Kirchler (2007) proposed a framework based on the purchase-decision model by Kirchler, Rodler, Hoelzl, and Meier (2001). In this conceptual framework, three stages are identified. The first stage entails decisions before taking up credit, the second stage entails the actual credit-take-up decision, and the third stage entails phenomena occurring during the repayment period.

Research addressing decisions before credit take-up focuses on motives to obtain credit and the availability of credit, as well as on attitudes toward credit use. When people have made the decision to borrow money, they do not necessarily sign a credit contract immediately. They may reconsider a purchase and credit use again and, depending on personal and situational factors, hesitate and delay or simply change their mind and forgo the planned purchase. For instance, after discussing purchasing alternatives and loan conditions with friends, an individual may consider advice against the planned purchase or loan and decide to either save money and buy at a later point in time or to abstain from buying the good altogether. However, if an individual decides to use credit and enter the second stage of actual credit take-up, he or she may on the one hand immediately raise credit, for instance by financing the purchase through the store or by using a credit card or accepting implicit credit use by late payment. People do not necessarily feel like going into debt when purchasing on a credit card but, rather, perceive credit card use as making purchases from their own funds.

On the other hand, rather than deciding to purchase on credit card, signing a credit contract may result from deliberate decision making and consideration of payback rates, possibilities of indebtedness, and the risk of over-indebtedness. Deliberative decision making implies information search and knowledge acquisition, comparison of credit alternatives, and evaluation of costs and risks over time, as well as measures to prevent difficulties of paying back credit and the risk of over-indebtedness. Also, after deliberate decision making about loan alternatives, one may opt to postpone a purchase until the necessary savings are made or may reach the conclusion that the product should not be purchased at all (Kamleitner & Kirchler, 2007). When people have decided to use credit for the intended purchase and have purchased and possess the commodity or use the service, they need to start paying off the debt in installments. Payment of installments continues for a long period after experiencing the rewards of the purchased product. The burden of repayment may differ from how repayment experiences were predicted at the time of credit take-up, and also the pleasure of possessing a good may depart from what is predicted at the time of purchase. Also, financial hardship may temporarily occur, so that paying back installments becomes difficult, and at other times people may earn more money such that installment rates are easily met.

**Motives.** While credit use is most often perceived as a means to buy without actually having the necessary financial funds, people also use credit when their liquid assets would permit

them to buy in cash. In this case, the decision to use credit may be mainly motivated by the desire to maximize one's profit. People could also decide to take credit and commit to an installment plan with fixed rates in order to strengthen self-control. According to Norton (1993), credit is used either to maintain or to improve one's lifestyle. The need to safeguard savings, to even out demands on income, and to deal with financial crises or adversity are considered maintenance motives, whereas taking advantage of consumption opportunities originates from the motive to improve one's lifestyle (Walker & Parker, 1988). While low-income families have a stronger need to borrow money as a substitute for income to maintain their lifestyle and buy products that quickly depreciate in value, higher-income groups have less necessity to borrow money for maintaining their lifestyle (e.g., Croden, 2000; Christen & Morgan, 2005).

Almost three quarters of a century ago, Keynes (1936/1997) identified six motives for borrowing money: enjoyment, extravagance, short-sightedness, miscalculation, ostentation, and generosity. Besides individual motives to consume, social motives, such as social comparisons resulting in the desire to possess what others have, play an important role. According to the relative-income hypothesis (Duesenberry, 1949), people compare themselves with others' consumption habits. If they have fewer financial resources available to buy goods and services than others demonstrate to have (Karlsson, Gärling, Dellgran, & Klingander, 2005), they may try to close this financial gap by borrowing money. People with less need to belong to a socially wealthy class (which represents their reference group) and people that are less present oriented are less apt to use credit (e.g., Groenland & Nyhus, 1994). Moreover, in countries with high income inequalities, social comparison processes seem to induce low-income groups to balance these inequalities by borrowing money (Christen & Morgan, 2005). Social comparison and the desire to belong to a particular (wealthy) reference group and to differentiate from others via material possessions result in the desire to possess what reference-group members possess. When one's income does not allow purchasing the relevant "symbols," an option is to take up credit (e.g., Livingstone & Lunt, 1992; Roland-Lévy & Walker, 1994). Indebted people express more often than nonindebted people the need to identify with relevant others and the importance of "having to be" (i.e., having in the sense of owning; see, e.g., Bernthal, Crockett, & Rose, 2005). Credit gives access to "valorized identity" (Viaud & Roland-Lévy, 2000).

**Attitudes and mental accounts.** The more optimistic people are, the more likely they are to borrow money (Brown, Taylor, & Wheatley Price, 2005; van Raaij & Gianotten, 1990). People with more positive attitudes toward borrowing money specifically are more likely to use credit and run into debt than are people who hold negative attitudes about borrowing (Livingstone & Lunt, 1992).

Willingness to use credit is also related to mental accounting (Thaler, 1999), which is how people keep track of their finances. Such accounting is often viewed as a mechanism for

self-control by constraining the budgets for each account. Karlsson, Gärling, and Selart (1997) manipulated the source of money for consumption (income, income increase, or saved money) and for saving for a buffer or for a desired goal, as well as manipulating consumption motives such as replacement or purchase of a desired commodity. Participants were asked to indicate their propensity to pay for a product either in cash or by an installment plan. If the participants used savings and if saving and consumption motives and attitudes were not compatible, they were more inclined to use credit. Although mental accounting may in most cases work as an efficient self-control technique, it may also result in inefficient behavior such as overconsumption, if budgets are set too high (Heath & Soll, 1996), or in self-deception through a decoupling mechanism (Prelec & Loewenstein, 1998).

**Availability.** Availability of credit leads to increased spending behavior (Gross & Souleles, 2002; Soman, 2001; Soman & Cheema, 2002). Credit availability seems to affect behavior at the point of purchase. Feinberg (1986) demonstrated that the mere indication of the possibility to use a credit card can increase the amount people estimate they will spend and can reduce their decision time. Tipping, the amount spent in department stores, and willingness to increase offers in an auction for event tickets increase if people pay by credit card instead of cash (Feinberg, 1986; Prelec & Simester, 2001). However, the option of installment billing instead of paying the full cost up front can also decrease the perceived quality of a product and decrease one's demand for it (Anderson & Simester, 2001).

**Information search and knowledge.** Deciding to take up credit is a complex process with risky implications. Search for information about credit alternatives is thus relevant to reaching an economically sound decision. In many cases, however, people take up credit on impulse, especially when they use credit cards. Berthoud and Kempson (1992) report that, excluding credit cards and other sources of revolving credit, 8% of consumer credit decisions are made on the spur of the moment. Day (1972) found that only 27% of credit users recalled searching for credit information prior to credit use and that only 20% considered alternative credit sources. In the last decades, the situation has not changed. At the beginning of the 1990s, approximately 20% of credit users indicated that they had considered searching (Chang & Hanna, 1992), whereas in 2003 only one third of people holding a credit card had compared various offers before application (Hilgert, Hogarth, & Beverly, 2003). Credit card users believe that it is easy to obtain information and so, ironically, they do not seem to think it is necessary to do so (Durkin, 2000). An individual's house bank (i.e., holding his or her savings account, salary account, etc.) and personal contacts like friends, colleagues, and family members are mentioned as the most important sources of information (e.g., Kaynak & Harcar, 2001).

Furthermore, the probability of search seems to increase with higher amounts borrowed, greater previously experienced debts, higher income, higher educational level, and relative

credit inexperience (Chang & Hanna, 1992; Drecnik Worden & Sullivan, 1987). Also, negative experiences, such as failing to obtain credit previously, reduce the probability of search, probably because in these cases borrowers directly choose the most promising lender (Drecnik Worden & Sullivan, 1987). Those most likely to search for information about credit are young singles and people having easily realizable assets (Drecnik Worden & Sullivan, 1987). With regard to credit cards, information about interest rates is increasingly important. The more that features are interesting to borrowers, the more extended is the search for information and the more complex is the decision (Durkin, 2000; Hogarth, Shue, & Hotynski, 2000).

Reasons for shallow search of information are high search costs, time restrictions, low motivation, and the issue being too complex to make appropriate assessment of all relevant information possible (Canner & Lockett, 1992). Ranyard, Hinkley, Williamson, and McHugh (2006) explicitly traced how people compare different credit offers. They found that borrowers focused on the annual percentage rate and total cost when choosing between different credit sources. Most participants actively compared different options and decided by using simple heuristics. If people had to choose repayment plans, they focused on trade-offs among repayment amounts, loan durations, and total costs. Perry (2008) stresses that people are overconfident about their financial possibilities and often overestimate their credit ratings. Meier and Spenger (2008a, 2008b) investigated differences between individuals who chose to acquire personal financial information through credit counseling programs. Arguing that many borrowers lack knowledge about financial issues—which is a cause of poor financial decision making—the researchers hypothesized that the acquisition of financial information would lead to better credit handling. They found that the more patient individuals are, the more likely they are to take part in counseling programs; and the more impatient, the higher will be their amounts of credit card debt.

People mostly lack information about the exact costs of credit use, and they know neither exactly which interest rates would be reasonable nor how much charges ought to be paid (Berthoud & Kempson, 1992). Katona (1975) speculated that people are simply not interested in exact and complete knowledge but are only concerned about the monthly rate drawn from their accounts. In the last decades, consumer knowledge may have improved. Durkin (2000) found that the awareness of annual percentage rates by credit card holders has increased since the 1970s. However, this is not what Berthoud and Kempson (1992) argue with regard to knowledge of interest rates. Indeed, a majority of credit card users frequently underestimate past spending even a short time after purchasing (Soman, 2001; Srivastava & Raghubir, 2002).

**Intertemporal choice and discounting.** With regard to estimates of the costs of a loan and of the duration and burden to pay it back, Ranyard and Craig (1995) and Ranyard et al. (2006) examined borrowers' mental representations of installment credit and whether people consider both the recurrent effects of repayment and the total costs related to credit

use—termed dual accounting. They found evidence for dual accounting at the time of credit take-up, which improves the quality of decisions. A particularly relevant aspect of credit is the duration of credit payback (see also Wonder, Wilhelm, & Fewings, 2008). Generally, people underestimate loan duration, especially for longer loans. Ranyard and Craig (1993) speculate that credit users' specific information-processing heuristics and time-discounting views account for their misperception of loan duration. With regard to processing heuristics, credit information is represented either in a simple total account or in a more complex, recurrent budget-period account. With regard to time discounting, models of rational economic behavior assume that individuals discount future costs and benefits at an exponential rate. However, there is ample evidence that individuals discount according to a quasi-hyperbolic discounting function, such that events close in time are discounted at a high rate and events in the future at a falling rate (Ainslie, 1975, 1991; Thaler, 1981, Loewenstein & Thaler, 1989). In case of long durations of credit payback, quasi-hyperbolic discounting would lead to underestimates of the duration. This was shown by Lewis and van Venrooij (1995), Overton and MacFadyen (1998), and Ranyard and Craig (1993). Duration estimates were more accurate if people used formal methods to calculate credit costs, if they had training in economics, and if they had already had experience with credit use. Duration was especially misperceived if payback periods were extended and repayment amounts were low, as well as if people had no clear information about monthly and total interest charges.

Decisions about taking the burden of a loan, about payback rates, and about the amount of benefit from a desired product that can be purchased with borrowed money are intertemporal choices; people need to consider, on the one hand, the rewards of immediately purchasing and using or consuming the product, and on the other hand, the burden of sequential installments to be paid in the future. At the time of credit take-up, intertemporal choices pertain to the benefit of immediate consumption or, if people are patient, postponement of purchase and consumption in the future. When they are impatient, they need to consider costs of immediate payment or credit use and costs of payments in the future. Research on intertemporal choice has repeatedly and consistently shown pervasive devaluation of the future. Future costs and the value of future benefits are smaller than present costs and the value of present benefits (Ainslie & Haslam, 1992; Frederick et al., 2002). In other words, buying and using or consuming a product immediately rather than at a later point in time, and paying later for it, is most rewarding. This should be especially true for more impatient or impulsive people with less self-control.

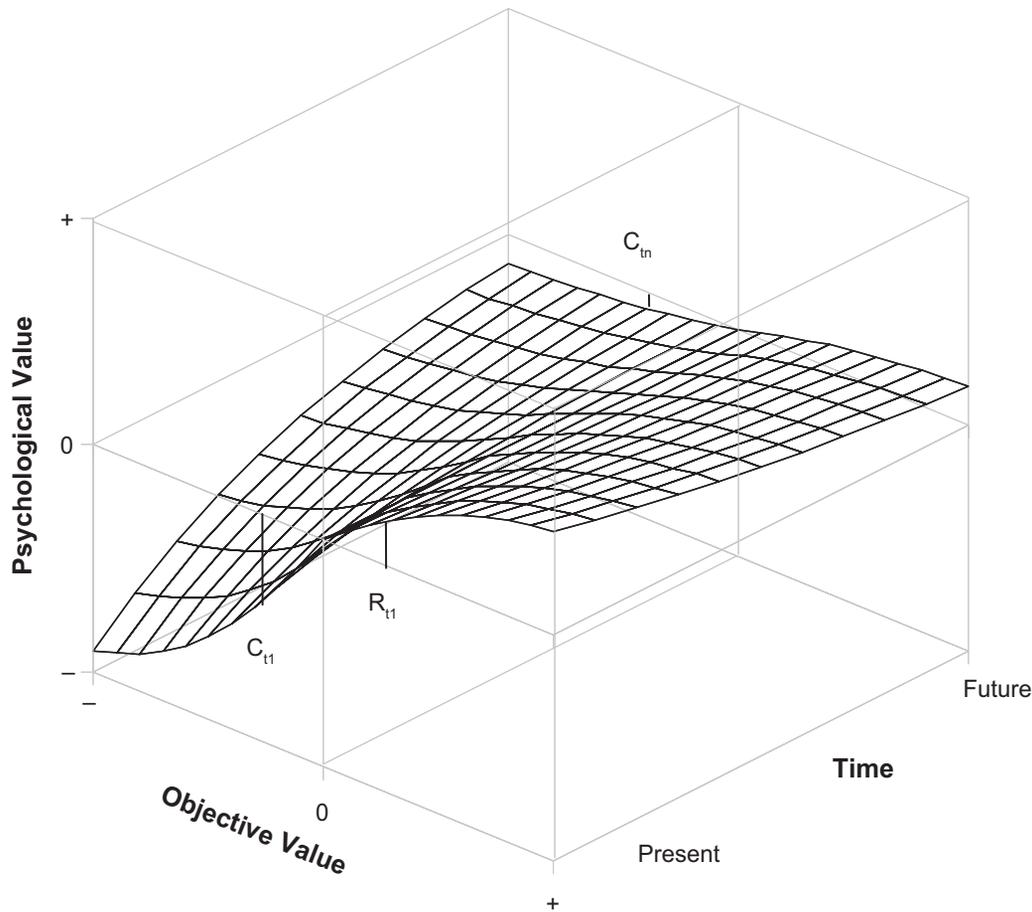
According to prospect theory (Kahneman & Tversky, 1979), the psychological value of immediately possessing a commodity or using a service should be high. But also, according to the theory, the subjectively held costs of paying the commodity's price should be large. Assume that the objective value of a product equalling  $R$  at time  $t_l$  makes a person well off and an objectively equal price would lead to a high psychological cost  $C$  at time  $t_l$ , so that (subjectively felt) costs may exceed

rewards ( $R_{t_l} < C_{t_l}$ ); people may in this case abstain from purchasing the product. However, if rewards are immediate ( $R_{t_1}$ ) and the price is payable at a later point of time ( $C_{t_n}$ ), then quasi-hyperbolic discounting will cause the future costs to be discounted, and the difference between  $R_{t_l}$  and  $C_{t_n}$  is likely to be positive ( $R_{t_1} > C_{t_n}$ ; Mowen & Mowen, 1991; see Fig. 5), so that people would decide to buy. Finally, if people have the opportunity to take a loan that will be repaid by small amounts in the future, then the costs should appear even lower. The future costs,  $C_{t_2}$ ,  $C_{t_3}$ ,  $C_{t_4}$  and so on are not only distant, they may also appear small, as monthly installments are rather low amounts ( $R_{t_1} > \text{Sum}[C_{t_2}, C_{t_3}, C_{t_4}, \dots]$ ). The aggregated psychological value of all costs may appear even smaller than the total costs payable at once at a future point in time. Several economic theories propose that present orientation and a high discounting factor drive borrowing in general (Fehr, 2002; Laibson, 1997).

Experimental studies show evidence for that people discount future payments on small credits more than they do payments on large credits, that immediate installment payments induce higher discount rates than do distant payments, and that delays in payment time lead to a decline in discount rates (Estelami, 2001). Subjective discount rates also vary depending on how credit conditions are framed. The costs of credit are perceived differently depending on whether credit payback is presented in aggregate form as a lump sum or in disaggregate form as periodical installments. The costs are also perceived differently depending on whether amounts have odd endings (e.g., \$199) or even endings (e.g., \$200). In case of even endings, discount rates for disaggregate amounts appear a little smaller than they do for aggregate amounts, whereas in case of odd endings, discount rates for disaggregate amounts appear much smaller (Estelami, 2001). Also, the amount and complexity of information matter. Estelami (2001) concludes that more information about a credit offer can lead to information overload, provoke cognitive simplification strategies, and result in a loss of accuracy in credit decisions. The form and complexity of credit offers influence whether or not people anticipate the costs correctly; so do the different visual layouts of credit offers (e.g., pictures, photos, and tables; Bertrand, Karlan, Mullainathan, Shafir, & Zinman, 2005).

**Risk-defusing operators.** When people borrow, they face the risk of not being able to pay their installments and the risk of becoming overindebted. If people realize that the attractive alternative, such as taking credit, may produce a negative outcome, they may seek means to reduce or avoid this risk when considering taking a loan. Such means include risk-defusing operators (Huber, 2007; Huber & Huber, 2008), defined as actions intended to be performed in relation to a specific alternative and expected to decrease the associated risk of the negative outcome. People who want to buy an apartment or a car on credit but are uncertain whether they can meet the monthly installments may obtain consumer credit repayment insurance.

Risk-defusing operators are quite common in everyday risky decision making. A risk-defusing operator provides the

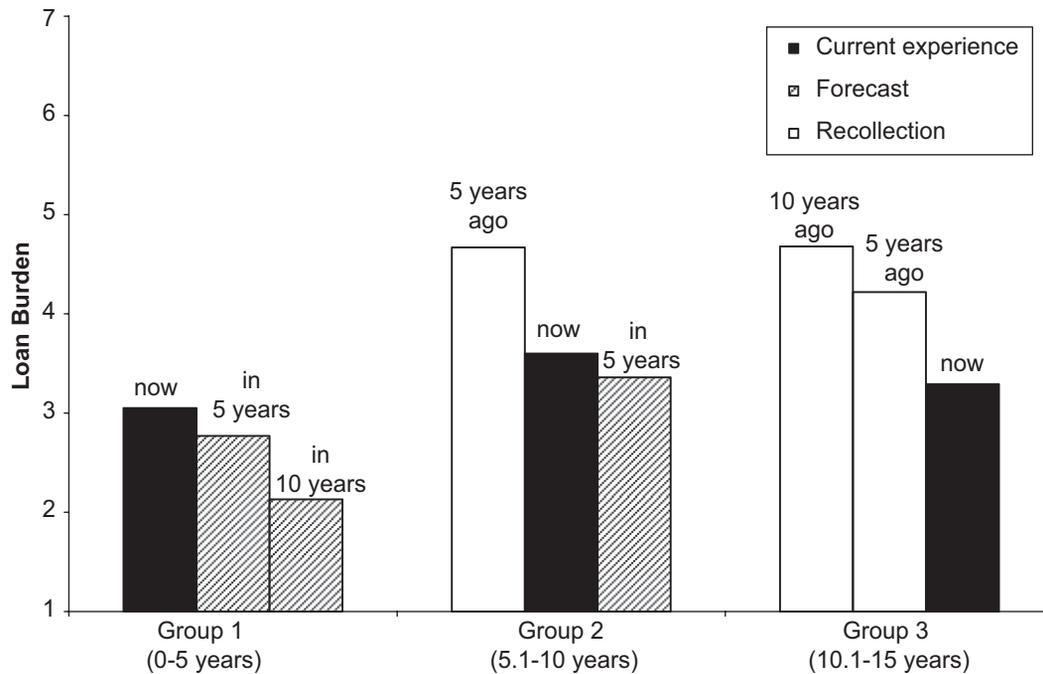


**Fig. 5.** Objective and psychological value of rewards of buying and costs of paying at different points in time.  $R_{t1}$  = subjective value or rewards of a purchase at present;  $C_{t1}$  = subjective value or costs of a purchase at present;  $C_{tn}$  = subjective value or costs of a purchase in the future.

decision maker with at least some control over the risk, and controllable risks are experienced as less serious than uncontrollable risks (e.g., Weinstein, 1984; Vlek & Stallen, 1981). Ranyard, Hinkley, and Williamson (2001) and McHugh and Ranyard (2009) examined risk-management strategies (in particular consumer credit repayment insurance) used by people with different kinds of credit experience. Behavior was shown to be consistent with a two-dimensional threshold model. If a risk exceeded both a threshold of loss probability and a threshold of loss value, risk-defusing operators such as consumer credit repayment insurance or planning for a worst-case scenario were activated. In cases of small borrowed amounts and short loan duration, risks were denied. However, if a decision to accept consumer credit repayment insurance was made—which was particularly likely if a person had made unsuccessful claims or had already experienced payment difficulties in the past—information search focused on the key attributes of the conditions of credit use and costs of repayment insurance.

**Coupling versus decoupling.** Decisions to buy on credit involve costs and benefits. Depending on the mental associations they make between the costs of the credit and the rewards

of consuming the credit-financed product, different borrowers will experience a loan burden differently. They may integrate costs of credit and the rewards of consuming the product, or they may segregate costs and rewards (Kamleitner & Kirchler, 2006). Prospective double-entry mental accounting, proposed by Prelec and Loewenstein (1998), is relevant to such experiences at credit take-up and during payback periods. Such accounting refers to interactions of present and future pain of payments with present and future consumption pleasure. Integration of costs and rewards is termed coupling, while segregation of costs and rewards is called decoupling. Coupling and decoupling, respectively, define the degree to which thoughts of consumption arouse (i.e., are coupled with) thoughts of payment and vice versa. Double-entry mental accounting is thus a reciprocal interaction between the pleasure derived from consumption and the pain associated with paying; as long as payment and consumption are mentally coupled, pleasure of consumption should be attenuated by painful thoughts about the remaining payments as long as a good is not fully paid off. When coupled, buying and paying are perceived to be fused like two sides of the same coin, and the pleasure of consumption should be reduced.



**Fig. 6.** Loan burden by homeowners living in their home up to 5 years, 5.1 to 10 years, and 10.1 to 15 years as currently experienced, forecasted, and recollected.

The widespread use of credit cards, and consumers' inclination to purchase more if credit cards are accepted in a store, are frequently attributed to decoupling of consumption from payment. Moreover, credit card bills usually contain several items bought in the past, and people often think in terms of the total amount to be paid rather than the costs of single items; they fail to attribute costs from the overall bill to particular items (Gourville & Soman, 1998). The double-entry mental accounting model predicts that loan payments become progressively less burdensome because the outstanding debt balance and the associated pain frequently shrink more quickly than does the utility derived from consumption. In addition, the model predicts that credit financing is mostly accepted for long-lasting goods that either do not depreciate in utility or do so only slowly, such that the pain of paying is buffered by the utility derived from the good. This line of argument is supported by Beggan (1994), who found that a majority of participants viewed paying back a loan as a gain rather than a loss. When imagining or taking up a loan, participants may shift their reference points to the state of being in debt. Any installment payment would then be perceived as an action leading to reducing the debt and thus as a gain. Moreover, credit users frequently believe that monthly payments are all that matters (Emmons, 2004) and that credit is an alternate form of income (Norton, 1993). They seem to frame credit use as delayed payment or as an agreement to gradually pay in the future.

According to Prelec and Loewenstein (1998), while cost-to-benefit associations buffer the pain of payment, benefit-to-cost associations attenuate consumption pleasure. In other words, if people are aware of the rewards of a purchase when paying for the respective item, the burden of payment is reduced; when

they think about the costs of an item, the pleasure of the purchase is reduced. Although the double-entry mental accounting model has found support in laboratory experiments, other empirical evidence is scarce. Some such evidence include that credit users seem to buffer the pain of paying with consumption pleasure stronger than they attenuate consumption pleasure by pain of paying. Kamleitner and Kirchler (2006) termed this finding a mental one-way street from the loan to the good. Furthermore, the degree of coupling may be related to the perceived value of consumption and payment, and coupling may decrease over time, which would explain increasing pain of credit payback.

**Repayment experience.** Anticipation before taking a loan, experiences during paying it back, and recall of credit take-up experiences and experiences during and after paying back a loan may differ. As Hoelzl, Pollai, and Kamleitner (2009) found in a survey of homeowners, credit users' expected burden of paying back a loan was smaller than their actually felt burden during the payback period. In the survey, three groups living in their homes for 5 years, 5 to 10 years, and 10 to 15 years were asked about the current burden, the predicted burden, and the recalled burden of their loan. Credit users should see the loan burden as decreasing over the payback period, but this was found not to be the case. The perceived burden remained similar over the period with no systematic change over time. As Fig. 6 shows, both predictions and recall of experiences differed from actual experiences—again, while predictions were more positive, recall was more negative than actual experiences of payback burdens. Moreover, the stronger the mental association between the purchased home and the

loan—that is, the more thinking about the home evoked thoughts of the loan—the higher was the experienced loan burden. Also, strength of associations between home and loan did not change over time. Still, homeowners predicted and recalled a decrease in home-to-loan association. Hoelzl et al. (2009) conclude that these “misforecasts lead people to overestimate their capability to deal with a loan in the long run. ... It would therefore be in the interest of consumer organizations and creditors to inform loan users that taking out a loan always involves a financial and emotional burden and that their forecasts can be misleading” (p. 453).

Kirchler (2003) argues that credit users may hope that the experienced benefits of the purchased good make them feel better in the short as well as in the long run but that they may not correctly anticipate that their experienced pleasure will decrease due to habituation (Frederick, & Loewenstein, 1999). In order to deal with the hedonically unsatisfactory state of decreasing pleasure and increasing strains of payment, people in a consumption-oriented society are tempted to borrow again for further purchases, and consequently they may slide into problem debt. Indeed, most credit users and nonusers agree that credit encourages people to buy things they do not really need (Berthoud & Kempson, 1992).

**Reconstruction.** Most studies show that credit users are facing a complex task when they decide to take up credit and that they often fall prey to cognitive errors when anticipating their experiences with credit payback. The subjective pain of paying back credit after it has been paid off may be less pronounced than the costs experienced during the payback period. After payback, people may be tempted to repeat their original judgments and predictions. They may remember salient events and forget some of their experiences and weight peaks and the end experiences more heavily than the repayment process as a whole (Kahneman, 1994). The reconstruction of one’s experiences in hindsight is often biased (Fischhoff, 1975). Self-serving rationalization and justification processes may lead to the conclusion that “all ended well,” and all is well that ends well.

Reconstruction of the process of credit use may induce people to take up further loans despite difficulties during the repayment period. One would think that difficulties with paying back a previous credit would make people aware that borrowing money is risky and can lead to overindebtedness. However, this is not necessarily the case. At the end, optimism seems justified. The overall picture is that a vast majority of credit users expect to be able to keep up repayments (Berthoud & Kempson, 1992) and actually repay debts in an orderly and timely fashion, keeping default rates quite small (DeVaney & Lytton, 1995; Lawrance, 1995). Also, for low-income families, persistence of defaulting on credit payments or being in arrears was shown to be an exception, not the rule (Bridges & Disney, 2004). Frequent reasons for late payment are taking up too much credit and unforeseen life events (e.g., health problems) and, in fewer cases, forgetting about the payment (Canner & Lockett, 1991). If credit users experience payment difficulties,

they usually pay as soon as possible, cut back on other types of spending, try to increase their income (e.g., work more), try to obtain financial support from other sources (e.g., family), and seek to increase their financial knowledge (Canner & Lockett, 1991; Hayhoe et al., 1999).

## Summary

Preparedness to use credit and to take risks of indebtedness is increasing. Credit use may be conceived of as a process involving different stages of decision making, starting with the purchase of a product with borrowed money and ending with having paid back the borrowed money. Processes before credit take-up entail needs and desires for a specific product. Depending on characteristics of the product, decisions to buy or not to buy may involve spontaneous, habitual, or deliberate decisions, including in the latter case an extensive information search. The purchase-decision process consists of two interacting choices: the choice among the alternative products available and the choice of method of financing. If people reach the conclusion that they cannot afford the desired product, they may forgo the purchase or decide to postpone the purchase and save until the desired product becomes affordable. The decision to use credit varies among people depending on their individual motives to consume, social motives, and the availability of credit. If people decide to take up credit, they collect information about how to get a loan. Decisions about taking the burden of a loan and payback rates and benefiting from a desired product are intertemporal choices. As research has consistently shown, immediate rewards loom larger than delayed rewards. Current costs are likewise weighed highly but are heavily discounted when they occur in the future. Studies of processes after credit take-up focus on how people perceive their actual consumer credit and how they behave during the payback period. Credit users may not correctly anticipate their experiences with the purchased product and installment rates. In conclusion, it is not only recommended that counseling services, lending institutions, and banks be required to provide credit users with detailed information about interest rates, monthly installment rates, and total costs of credit; counseling services should also advise consumers that their experiences with credit payback may sharply differ from their predictions of future experiences at the time of credit take-up. Moreover, credit users should be advised to cope with possible future financial hardship by using risk-diffusing operators such as consumer credit repayment insurance.

## Household Consequences of Financial Crises

Individuals and households are affected by financial crises and economic recessions in several ways. They may lose income from unemployment and, for professionals and entrepreneurs, from fewer or less profitable contracts and sales. Other economic effects relate to fewer available or more expensive personal loans and mortgages. Some people’s wealth decreases due to losses on the stock market. Busts on the stock market

may also have consequences for pension incomes if those are partially or fully based on stock returns.

### **Consumer confidence**

The Index of Consumer Sentiment developed in the United States by Katona (1975) is an indicator of consumer confidence. The study of consumer confidence is a type of macro psychology, the aggregation of individual evaluations and expectations to a general feeling of optimism or pessimism. Adverse economic developments are reported in the mass media. People confronted with these messages become pessimistic about the international and national economy and about their own financial situation. In general, they are more pessimistic about the (inter)national economy than they are about their own financial situation (Van Raaij & Gianotten, 1990). Mass media reporting on economic affairs is especially important, because for most people the media are the main sources of information about economic developments. News in the media may be political news or the publication of consumer confidence scores (Vuchelen, 1995). Mass media mainly influence consumer confidence about the (inter)national economy. Confidence in consumers' own financial situation is more influenced by personal experiences such as income changes and job opportunities.

Consumer confidence affects consumer spending and saving. Pessimistic consumers will spend less, especially on durables; they will save more; and they will be more inclined to repay their debts. A decrease of consumer expenditure will lead to fewer sales for companies and will thus lead to a further fall of the economy, which in turn influences consumers to become even more pessimistic. It is important for economic policy to avoid this negative spiral, and if it takes place, to interrupt it by showing positive developments in order to restore consumer confidence.

### **Coping**

Many people are not prepared for economic losses and have too many personal loans or insufficient savings or wealth buffers to cope with adverse economic and financial developments. Coping with adverse, unfavorable economic developments is more difficult than adapting to favorable economic developments and increasing wealth (Caplovitz, 1979; Katona, 1975). People are accustomed to a certain lifestyle and level of expenses, and it is difficult, often even impossible, for them to curtail their expenses and change their lifestyles.

Van Raaij and Eilander (1983) investigated how people adjust their expenses to a lower income. They found a hierarchy of four curtailing tactics related to, in this order, price, quantity, quality, and lifestyle. The price tactic includes buying the same products at a cheaper store; buying cheaper products and brands, including store brands; buying when products are on sale, and buying special offers. The quantity tactic includes buying less of convenience (supermarket) products and delaying the replacement of durable goods such as home, car,

furniture, or TV set. It also includes using services less often, such as eating out less frequently and taking fewer vacations. The quality tactic contains a paradox. Some households, mainly high-income households, revert to purchasing high-quality products, presumably because they are more enduring. For high-income households, this is an affordable investment that will pay off in the long run. Other households, mainly low-income households, are forced to buy cheaper, low-quality products. These products may wear out sooner than high-quality products and are thus actually more expensive than high-quality products. The fourth tactic, lifestyle change, is the most difficult one for most people, and for this reason comes last in the hierarchy. Lifestyle changes include more household production, such as making and repairing one's own clothing, doing repair jobs oneself in and around the home, selling the car or the home, and forgoing an annual vacation. Making lifestyle changes is painful and socially unattractive to people because it shows clearly to others and to themselves that they are affected by and victims of the adverse financial development. People thus try to cope with a lower income by the price, quantity, and quality tactics before they resort to lifestyle changes. Selling goods that are part of their lifestyle will thus be a last resort for people; yet from an economic perspective, it is the most effective way to cope with adverse financial developments.

If households have savings, they will try to compensate for the negative circumstances by using their savings. To do this, they need to have an idea of how long the negative circumstances will persist. If they perceive favorable indications, for instance a new job opportunity, this is a sensible strategy. The following differences between people have also been observed (Van Raaij & Eilander, 1983): (a) Younger people are usually more flexible than older people, but somewhat paradoxically, older people who have experienced economic recessions before are better able to cope with the changed circumstances than are younger people without such experience; (b) pessimistic people are inclined to a quantity tactic of consumption reduction, whereas optimistic people try to continue their consumption and lifestyle by using a quality (substitution) tactic more often; and (c) people in higher socioeconomic strata are more inclined to adjust by substitution, whereas people in lower socioeconomic strata are more inclined to a reduction of consumption.

### **Countermeasures**

Curtailing expenses may be possible when people are taught improved budgeting and mental accounting techniques (Thaler, 1999). People may then become aware of their expenses and the possibilities of curtailment by systematically taking account of their spending on a variety of expense categories. People should in particular be taught to set targets or upper limits on their spending on different (mental) accounts. Usually, monthly periods may be used if wage payments are received monthly. An upper limit may relate to categories such as food, clothing, transport, recreation, and eating out. If the upper limit has been reached in a period (month), a further expense will be

avoided or delayed until the next month (Soman & Lam, 2002). However, using credit cards for payments makes this more difficult because the spending on different categories is aggregated to one total credit card debt (Soman, 2001) that may not be paid back in the same period (see also Antonides, De Groot, & Van Raaij, 2009). The use of credit cards does not facilitate mental accounting and should for this reason be discouraged if people want to attain control of their expenditure. Some banks, for instance ING in The Netherlands, have now started to offer (mental) accounting facilities on their Web sites to assist clients in achieving better insights into and control over their spending.

Implementation of countermeasures is not an easy task, however. There are large differences related to the level of education, age, gender, and occupation in people's knowledge of financial management and the many products offered by financial institutions. Most people furthermore dislike to think about and to compare financial products before making a decision, for instance on a mortgage. Many people even lack the motivation to acquire knowledge of financial products and procedures needed to function in a complex financial world, one in which people increasingly become responsible for themselves as they can rely less and less on governmental regulations for protection and support (Antonides et al., 2009).

## Summary

Research has investigated how individuals and households cope with economic hardship caused by financial crises and economic recessions. A hierarchy of coping tactics, including buying cheaper, buying less, buying higher quality (more enduring products), and buying fewer (or selling) durables, has been demonstrated. As the latter implies lifestyle changes, it is a last resort, even though it would be the most effective way of coping. Needed even more today is education in financial management and increased knowledge of financial products; it is needed also in times of economic upswings and preferably as part of the school curriculum.

## Trust in Financial Institutions

A societal consequence of economic crises attributed to financial services provided by banks, pension funds, insurance companies, and intermediaries is the loss of trust that their clients, as well as the public in general, have in their products and policies. Mass media news about products that are not beneficial to consumers, large bonuses to managers, large provisions to salespersons, orientation toward investor value (rather than customer value), bank failures (current examples include Northern Rock and IceSave), and risky takeovers (examples are Fortis, Bank of Scotland, and Banco Santander taking over ABN Amro Bank) have undermined the trust of clients and the public at large. Trust is crucial for the functioning of the financial system and society (Luhmann, 1979; Mosch, Prast, & van Raaij, 2006). Trust is related to the future behavior of persons and institutions and may be defined as the experience of

certainty where no real certainty can exist. People who trust a person or institution are confident in predicting the future behavior of that person or institution even though the person or institution is still free to behave in another way than predicted. A definition of trust frequently also includes the criterion that the trusted person or institution will not take advantage of the trusting party.

How does trust in a financial institution originate, and if trust is gone, how can it be regained? Pirson and Malhotra (2008) distinguish five determinants of trust; to those we add two determinants considered to be relevant in the present context. We thus identify the following seven:

1. *Competence* is knowledge of financial products and the competence to communicate this knowledge to customers. Knowledge of customer financial knowledge and knowledge of risk attitudes are ingredients of competence (Loonen & van Raaij, 2008). If financial products become so complex that even bank employees do not fully understand them, customers' evaluation of bank employees' competence will be lessened.
2. *Stability* is the continuity and solvency of a bank, insurance company, or pension fund. Customers expect that the financial institution will still exist after 30 or 40 years, when they want to take out their savings, their investment earnings, or pension or insurance claim. Predictability of the financial institution is related to this. People trust an institution more if they perceive that they can correctly predict its future developments. Governmental guarantees are a way to provide stability, and thus trust, in the financial system. Banks, insurance companies, and pension funds are important parts of the national and international financial infrastructure.
3. *Integrity* is honesty and carefulness in procedures and treating all customers in the same way. Integrity also requires that financial institutions act according to a professional or industry code. Integrity may be self-regulated by the industry or forced upon the industry by governmental authorities. Integrity comprises rules and regulations about how to treat customers, as well as social and societal responsibility and remuneration of managers. A proposed professional oath of bankers may be part of an integrity program. Customers evaluate integrity positively but may also experience integrity of their financial-services provider as dispassionate, bureaucratic, and too formal.
4. *Benevolence* comprises giving advice and communicating from the client's perspective and the client's interest, not (solely) from the bank's perspective. Benevolence is visible in customer care and empathy with the client. Benevolence often implies that a long-term relationship with the client (loyalty) is more important than a short-term profitable transaction (Poiesz & van Raaij, 2007). If banks sell not only their own products but also other providers' products if the latter are better for the customer, it reinforces the perception that customers and their needs are central. A

proactive approach to clients also strengthens trust. Banks have to warn their clients about changed economic and political circumstances and the consequences of this for their clients.

5. *Transparency* is openness and the use of understandable information about complex products, as well as the offering of less complex products that are naturally more understandable. Transparency also pertains to clear information about liability, rules, procedures, and consequences of economic changes (e.g., in interest rates, house prices, and recessions). Transparency is an important determinant of trust, although more transparency does not always lead to more trust. Transparency about bonuses for managers and provisions for salespersons is meant by policymakers to have a preventive effect to decrease, or at least not to increase, these bonuses and provisions. If customers know exactly how much a salesperson earns from a transaction, this may lead to stronger negotiation power for the customer but lower trust in the salesperson.
6. *Value congruence* is the congruence or agreement of important values and norms of a financial-services provider and its customers. Value congruence creates identification of customers with their financial-services provider. Examples are banks that have sustainability and fair trade as their core values and that do not invest in the weapon industry, child labor, or unsustainable products. These banks attract clients who have the same values. Value congruence is a good base for trust, loyalty, and a long-term relationship.
7. *Reputation* is the positive evaluation of a financial-services provider based on its performance and communication in the past. Branding, defined as the positioning and formation of favorable associations by advertising, plays a role in the building of reputation. Reputation is also built by customers' personal experiences and by word of mouth. Reputation may be related to a differentiating characteristic ("positioning") of the service provider, such as an emphasis on low prices, competence, or innovativeness. Low prices are also frequently associated with low quality and may thus lead to less trust.

The first four determinants are mainly necessary preconditions or, as Herzberg, Mausner, and Snyderman (1959; see also Oliver, 2009) call them, "dissatisfiers." A provider of financial services has to comply with certain criteria and requirements of competence, stability, integrity, and benevolence to earn trust. Satisfying these four determinants may bring trust from negative to neutral. If these determinants are not satisfied, trust is impossible. These four determinants cannot be compensated for by other characteristics. For instance, an advertising campaign cannot compensate for incompetence or a lack of benevolence.

The last three determinants are "satisfiers" (Herzberg et al., 1959). Satisfying some or all three determinants may bring trust from neutral to positive. Transparency, value congruence, and reputation are desirable and may differentiate a financial-

services provider from competitors. A level of competence that exceeds the competence expected by the customer may also become a differentiating or positioning factor. Above a certain level, competence may then change from being a dissatisfier to being a satisfier.

In the aftermath of financial crises that result in reduced trust in financial institutions, both the institutions themselves and governments need to regain trust. Institutions and governments should consider the determinants of trust listed here. And in the longer term, empirical research that assesses the relative importance of the identified seven determinants needs to be promoted.

## A Social Psychological Perspective on Economic Crises

Asset bubbles, which inflate slowly at first, then rapidly, and then suddenly burst, have a long history. Examples include the tulip frenzy in 17th-century Holland; the South Seas bubble of the 18th century; the stock market boom and bust of the 1920s; the dot-com boom and bust of 1996–2000; and as we write, the credit crunch following the housing market boom of 2002–2007. In his historical overview, Rapp (2009) speculates about the human element involved; and authors like economists Galbraith and Keynes, also not psychologists themselves, have seemed confident about their broad-brush descriptions of the human condition. Bubbles are generated by greed and "momentum buying," ignoring the original stimulus for the boom, and real value becomes irrelevant. The bubble is fuelled by overconfidence and optimism (as well as influences like low interest rates and readily available inexpensive credit). And the "madness of crowds" and self-fulfilling prophecies encourage people to do things that they would not otherwise do. All of these elements combine with a mass desire for riches and the assumption that wealth and intelligence are related. It is only when a bubble bursts that it becomes clear, as never before, that financial experts can be stupid. It seems as though greed is so powerful that it makes people myopic, with short memories and an ignorance of history. During and after the bubble, there is no general and coherent questioning of the nature of capitalism, even when things go disastrously wrong. Another bubble and bust is always inevitable.

The proximal causes of the contemporary credit crunch are of course contested, but there is a degree of consensus (e.g., Akerlof & Shiller, 2009; Krugman, 2009). Briefly, large amounts of money were lent to "sub-prime" mortgagees who were unable to keep up with repayments as interest rates rose and house prices fell. Mortgage companies sold their debts to finance companies, and these debts were in turn bought by financial intermediaries. Alongside all this complexity and confusion, rating agencies got their risk assessments wrong, not least because of conflicts of interest in which the rating agencies were being paid by the sellers of the securities they were rating.

At the G20 Summit in April 2009, the wealthier nations dedicated over \$1 trillion to the International Monetary Fund

to help struggling economies, and they agreed on restrictions on bankers' pay and bonuses. This followed actions in the United Kingdom and in many other countries where banks have been bailed out using massive injections of public funds.

From an economic and technical perspective, it is not that difficult to be wise in hindsight. The nature of banking has fundamentally changed in recent years. Many modern banks lend money with a much smaller capital base or, put more starkly, lend money they simply do not have. The process of "securitisation," wherein loans are sold on to other financial institutions, has not been seen as especially risky but as, instead, a financial innovation in which everyone benefits. It has been akin to bringing a miracle drug on the market before it has been properly tested. It now seems inevitable that independent financial regulations will need to have sharper teeth, with the hope that we "won't get fooled again" (or at least not for a while).

It is natural that economic policy advisors will use economic tools to alleviate the crisis, but there are other highly pertinent psychological "intangibles." Perhaps the most important of these is trust. The public no longer trusts financial institutions (and perhaps the capitalist system itself) in the same way it used to, and it is concerned about corporate greed and a lack of responsibility in high places. Ordinary people have been worried about the extent of borrowing for some time (even if most financial experts have not been). As long ago as 2001, in a national survey of the United Kingdom, 90% of respondents said financial companies are too willing to lend money (Nestlé, 2001).

In two related publications, Akerlof and Shiller (2009) and Shiller (2008) agree that psychological factors matter, but the authors are rather vague about them—recalling the Keynesian notion of "animal spirits." One of the psychological truisms Akerlof and Shiller discuss is the fact that people are susceptible to bubbles, be they housing price bubbles or an irrational exuberance for tulips. Shiller (2008) seems to take the view that while bubbles can arise with any kind of commodity, there is nevertheless something special about property and home ownership. There is a kind of collective wisdom that house prices simply have to rise. This is not a totally irrational expectation, as in the period 1997–2006 property prices in the United States rose by 85%. Increases in house prices are still not easily explained by interest-rate changes, building costs, and population growth; they seem to have a life of their own. Self-fulfilling stories shared by experts and commentators alike support false expectations about continued price increases—a kind of social contagion. It is indeed rational to follow a bubble, providing one understands that it is a bubble and not a reflection of fundamental values. If the psychological factors behind a bubble are as determinative as they seem to be, it entails that a "winner" (someone who gets out in time) has found a way of inoculating himself or herself from the disease.

Related to the notion of trust is the importance of confidence. If a government provides a financial stimulus, this increases the marginal propensity to consume (MPC) of some people who, by consuming, increase the MPC of others, and so on. This is called a multiplier effect. The reverse is true in

a recession, in which confidence is lost. There is a multiplier for confidence and lack of confidence, or even a multiplier for corruption and poor business practices like sub-prime lending, which are legitimized by the fact that "everybody else is doing it." This is reminiscent of social contagion as well as of "groupthink" (Janis, 1982), in which collective wisdom is so powerful that new contradicting evidence is ignored.

### **What kind of psychology?**

Akerlof and Shiller (2009) are among a growing number of economists who recognize that a psychological perspective is necessary in economic analysis. What makes these economists unusual is that they have actually borrowed ideas from social psychology and sociology. As noted in the preceding sections, most social science inroads into economic thinking have been made by cognitive psychology. This state of affairs was recently criticized by Etzioni (2009), who argued that a sociological perspective is also needed. One possibility is that cognitive psychology has the most relevance to microeconomics and social psychology or sociology the most relevance to macroeconomics.

One of the central tenets of critical social psychology is that one needs to consider cultural, historical, and political influences. The way people behave, their attitudes and values, and the way they perceive themselves are functions of these influences. If people are greedy and relentlessly pursue their own self-interest, they do not do this in isolation; it is behavior sanctioned in the culture in which they live at a particular time. Compared to psychology more generally, critical social psychology places less emphasis on evolutionary history and the idea that people are still locked into behavior patterns more appropriate for stone-age humans. Critical social psychology instead stresses the importance of multiple realities and contemporary choice. Greedy and self-interested behavior may be sanctioned in some work environments—although the language will be changed to "motivating high achievers"—but there are also plenty of examples of altruistic behavior, concern for others, and pursuits other than the pursuit of money. One is not necessarily talking about different types of people, as critical social psychology favors the construct of the multiple self—a trader may be ruthless on the stock exchange floor and considerate at home with family.

Table 2 presents a balancing act in two columns. In the left column ("Good Society–Model I") are values, characteristics, and economic and political factors that may be seen as characteristic of a civilized society. In the right column ("Good Society–Model II") is a mixture of factors that may also be required for a civilized society but that are heavily dosed with realism rather than idealism. The first row (the "Structural/Cultural" level) is a snapshot of two political-economic systems—one in which the government intervenes in order to redress market failures, and a second in which the interference of government is kept to a minimum as the markets do their good work. The argument we are making is that government policy influences which aspects of multiple selves can be most freely displayed. In the

**Table 2.** A Good Society According to Two Models

Level of description	Model I	Model II
Structure/Culture	Government: benevolent dictator Socially responsible business practices and long-term remuneration structures	Laissez-faire economy Sole responsibility to share owners' profit making and short-term remuneration structures
Occupation	Public sector: caring professions	Financial sector
Identity	Feminine	Masculine
Values & Cognition	Altruism Postmaterialism Pursuit of well-being Open-minded Less conventional	Egoism Materialism Pursuit of wealth Closed-minded Conventional

United Kingdom in the 1980s, Margaret Thatcher claimed that reducing the tax burden and provisions for social welfare put money in the pockets of individuals and that this encouraged individual benevolence and charitable giving—a “crowding in” of private charity to replace public sector coercion. The opposite philosophy is that a benevolent government with caring health and welfare programs encourages benevolence among citizens—the “demonstration effect.” The case for either side is far from clear cut (Jones, Cullis, & Lewis, 1998). We suggest that although governments in a democracy will reflect the preferences of voters, especially at election times, an elected government’s policies also shape organizational cultures, as well as the attitudes and values of citizens, throughout its term of office. Depending on one’s favored political philosophy, the policies of Margaret Thatcher and Ronald Reagan either encouraged individual responsibility or legitimized self-interested behavior.

At a slightly lower level (the “Occupation” level in Table 2), the organizations people work for shape their behavior as well. How are people rewarded at work, and what do they have to do to gain promotions? In careers like teaching and nursing, promotions come with experience and positive feedback from peers and superiors; the pay scales are relatively flat, and there are few opportunities for bonus payments or rapid promotions. In contrast, some bankers can earn large sums—including sizeable bonuses—at a young age, based on short-term performance. It is of course likely that the finance industry, teaching, and nursing attract people with different proclivities in the first place; but it seems clear that through the socialization process at work, organizational culture reinforces some aspects of the multiple self rather than others.

All these dichotomies are contested and are in flux, none perhaps more so than femininity and masculinity (the “Identity” level in Table 2). What is evident, however, is that a disproportionate number of women are found in the caring professions (although not necessarily in senior management) and more men are found in high-economic-risk-taking jobs in the financial sector. Research evidence also shows that women are more concerned about the welfare of others and are less likely to behave in a narrowly self-interested and instrumental manner than men are (Gilligan, 1982; Lewis, Carrera,

Cullis, & Jones, 2009). Similar divisions between men and women are found in the values of altruism and egoism.

Materialism is related to the continual need to consume more and to contexts in which material goals are essential aspects of people’s self-identity (the “Values and Cognition” level in Table 2; Belk, 2008; Dittmar, 1992; Kasser, 2003). It is also linked to the partly false belief that more consumption and more wealth lead to greater happiness (Diener & Seligman, 2004)—a belief that leads to a pursuit of wealth rather than a pursuit of well-being. This is a powerful belief, as attested by the highly successful lottery schemes in many countries. However, the research shows that people who score highly on materialist measures are often unhappy and that while the correlation between happiness and wealth is positive, it is not especially strong; health and employment are much more closely related to happiness (Oswald, 1997). Finally, cognitive distinctions between open and closed mindedness and conventional and less-conventional thinking are made.

Again, the two columns represent a balancing act. Neither model of society, on its own, will deliver—each needs the other. The question is, has there been too much of a cultural shift to the right-hand column at the expense of the left? Ironically, while the right column favors less government, it is the government in the left column that has responded to the excesses of the right in the credit crunch.

**Socially responsible and sustainable Investments**

**Identification of current problems.** In a crisis, someone has to be blamed, and in the current financial crisis the finger has been pointed at financial institutions (although not by everyone; see Booth, 2009). How can the financial institutions become more responsible? In the rest of this section we pay particular attention to the organizational structure of institutional investment and the role of “champions”—key actors in the UK asset management houses championing socially responsible investment (SRI) policies—as a mirror of a broader problem. Making the needed cultural shifts is no easy matter, but because people in any group, including those in the finance industry, are not entirely homogeneous, minorities of open-minded, socially

responsible thinkers exist, and now perhaps is the time when they are most likely to be listened to.

Like several other commentators, Guyatt (2009) identifies the credit crisis as multicausal. She cites the irresponsible mortgage lending of retail banks, the failure of credit rating agencies, and the lack of effective regulations, not forgetting the individual borrowers themselves (who, it may be recalled, have a tendency to argue “If I couldn’t afford it, why did the banks lend it to me?”). In the mix she also includes institutional investors and advisors, like those responsible for pension funds, and she questions why these financially powerful groups failed to challenge conventional thinking or question the pricing of credit risk. She argues that more financial regulation is inevitable but that financial institutions need to change within and not just respond to outside pressure—that is, that the organizational culture must be refocused. Three main problems are identified: lack of social responsibility, short-termism, and conventional thinking.

It will be recalled that the economist Milton Friedman had little use for social responsibility: “Few trends could so thoroughly undermine the very foundations of our free society as the acceptance by corporate offices of a social responsibility other than to make as much money for their stockholders as possible” (Friedman, 1962, p. 133). But Guyatt (2008) and Lewis (2002), among others, feel it is time to encourage a more “moral” market. A good example of such a market is one in which long-term environmental, social, and corporate governance (ESG) considerations are included within investment processes in order to achieve positive financial and social outcomes (Eurosif, 2006).

Although SRIs and sustainable investments (SIs) are long-term investments, case studies by Guyatt (2008) reveal that most fund managers have short-term horizons, even in institutions that claim to be committed to long-term, responsible goals. The main reason her interviewees give for this is a reluctance to be out of step with what the rest of the market is doing. And what the rest of the market is doing is trading rather than investing. Furthermore, most fund managers’ performance is assessed (and remunerated) on a short-term basis. In addition, the fund managers fear that unsuccessful longer-term investments would have dire consequences for their reputations, their salaries and bonuses, and even their jobs. In comparison, the collective memory of short-term failure over 3 or 6 months can be wiped out by success over the next 3 to 6 months. The implications of short-termism can be profound. First of all, it can lead to excessive trading and higher transaction costs. Perhaps more importantly, as fund managers imitate one another, short-term trading behavior leads to market volatility, bubbles, and crashes. The idea of SRI and SI is that such investments are over the longer term, providing an antidote to market volatility.

Conventions dictate what is deemed as acceptable behavior in a social setting, which in this case is the financial market. While herding may be conceived of as uncertainty reduction (see preceding section on behavior in stock markets), conventions are more deep seated and comprise long-held cultural and social expectations. These cultural conventions are often

implicit, taken for granted, and hard to change. They also include shared understandings of how financial markets work. Guyatt (2008) lists five external conventions: using valuation models to exploit short-term mispricing in the market; focusing on tangible financial criteria (where SRI and SI criteria are seen as intangibles); concentration on current drivers of performance rather than longer-term concerns; active mandates geared toward relative returns compared to an asset-based index or benchmark; and reviewing fund manager performance over short periods, typically quarterly.

**Possible remedies.** Juravle and Lewis (2008) have identified a number of impediments to changing institutional investment practices, impediments that mirror the kinds of problems faced generally when attempting to modify organizational cultures in the finance sector. Impediments may be individual, organizational, and institutional. While behavioral impediments like cognitive biases are familiar to research (as discussed previously), organizational and institutional impediments have not been explored to the same extent. Organizational impediments include remuneration systems for analysts and fund managers based almost entirely on short-term performance, inequitable remuneration packages in which SI experts are paid less than mainstream financial agents, and management systems and cultures in which SI experts have less well-defined career paths. The institutional impediments also include short-term market conventions and a focus on tangible financial criteria rather than on SRI intangibles. From this perspective, challenging short-termism requires addressing the problem at individual, organizational, and institutional levels.

Human agency can be a crucial impetus for change. Juravle and Lewis (2009) and Lewis and Juravle (in press) report interviews with 15 champions in order to gain insights into how change can be achieved. The following four key categories of responses emerged.

1. *Institutional impediments.* These include conventionality, short-termism, and materialism. Many SRI champions believe that financial markets, because of their short-termism and incentives for quick profits, fuel unsustainability. SRI teams are often frowned upon within their own organizations if they succeed. Interviewees said they were disliked if they succeeded and were stereotyped by their establishment.

2. *Institutional facilitators.* In 1999 in the United Kingdom, a change was made to the Pensions Act, whereby pension funds were newly required to report whether they took into account social, ethical, and environmental issues. This change provided the necessary impetus for forming SRI teams. In addition, corporate scandals in the United Kingdom and the United States have led to new regulatory initiatives. At the same time, high-profile industry consortia like the UN Principles for Responsible Investment, the Carbon Disclosure Project, and the Enhanced Analytics Initiative have all aided SRI supporters to raise awareness among asset owners. SRI advocates agree that government intervention is essential, as it is naive to believe the financial sector will put its own house in order unaided.

3. *Organizational impediments and facilitators.* SRI teams are often marginalized in contexts in which there is a structural segregation between them and conventional teams. Senior management may pay lip service to SRI teams but remain highly skeptical. SI only becomes part of the core business when senior managers value sustainability beyond its potential financial gains. There appear to be three main organizational structures. In the first, only one or two SI people are engaged in packaging research from outside SRI experts for conventional managers to use as they see fit. In this kind of organization, SRI is a long way from the core of the business. In the second, SRI teams do the analysis themselves and their information is included in the investment process, although they are not involved in the final investment decisions themselves. The third kind of organization is very rare. In these, SRI people are fully integrated in the decision-making process. In this third structure, the asset house has also addressed short-termism by incentivizing 3-year rolling performance for everyone in the group. This is in marked contrast to most other asset houses involving an element of SRI, in which SRI teams are paid less than conventional managers and in which conventional managers are incentivized on a quarterly basis. There is an understanding in this third type of organization that short-term investing is bad for the economy and society and that value can be delivered by fully integrating sustainability factors into traditional analysis.

4. *Championship strategies.* An important strategy that SRI innovators employ is learning the jargon of mainstream investors, the “language of the city,” and sharing narratives with them. SRI criteria can be seen as “immaterial” rather than “material,” part of a package of extra-financial factors rather than financial factors, so there is a battle over language. “Materiality” is a powerful buzzword, and SRI activists realize that they have to convince others that their issues are fundamental and make a strong business case for them. This is helped by initiatives such as the EU Trading Scheme, which prices externalities including CO<sub>2</sub> emissions. SRI champions also gain respectability through professional networks and through coalitions with, for example, the UN Principles for Responsible Investment. Acceptability in mainstream activities is also enhanced where teams have the full support of chief executives and investment officers. SRI advocates are unlikely to have financial qualifications similar to those of conventional market actors, so in order to be convincing, they must not only learn the language but also gain relevant expertise. SRI investment enthusiasts are often driven by their own moral concerns, but those concerns tend to be downplayed in the effort to make the business case. In fully integrated teams, this must be matched by conventional analysts gaining more expertise about SRI concerns.

## Summary

We argue that bringing about change in financial institutions is no easy matter. We suggest that what constitutes a good society needs to be a central issue in contemporary debates. Unfettered

narrow self-interest, materialism, and short-term trading (as opposed to investments) in financial markets are widely being questioned. Public opinion, government intervention, and the reactions of financial organizations themselves will all play key roles, yet cultural conventions are deeply ingrained. Key actors need to be given the incentive to devise longer-term financial plans that help to build “an inclusive, green and sustainable recovery” as stated in the G20 summit (The London Summit 2009, 2010). Education programs that underline moral aspects of financial decisions need to be central in university education and in workplace training.

It is not all doom and gloom, as human agency, alongside all the other influences, can help break the chains of conventional financial thinking.

## General Discussion

Financial crises are societal—today even global—phenomena that have many proximal and distal determinants (Rapp, 2009). To what extent and in what ways can individual behavior cause such phenomena? Tetlock (1998) analyzed several possible metatheoretical stances concerning the relationship between explanations of macro-level phenomena at an individual-actor level. It is beyond our scope to discuss the controversial issue of how to explain macro-phenomena in greater detail. In this monograph we have suggested that common individual cognitive biases, affective influences, and social influences play some role in market anomalies. We do not deny that cultural and institutional factors also play a role. In the preceding sections, we have expressed a view that may be contrasted to other (more comprehensive) views, such as those by the economists Akerlof and Shiller (2009), Galbraith (1955/1997), and Krugman (2009). In drawing on what is referred to as behavioral macroeconomics, Akerlof and Shiller make several bold propositions about the role of individual behavior in the current financial crisis (as discussed in the previous section). We want to exert greater caution than they do in (a) inferring behavioral causes of market anomalies and, even more, in (b) inferring that market anomalies are causes of financial crises.

It is difficult to overestimate the importance of the historical introduction of money as a means of payment—replacing barter economies—for the development of efficient markets (Lewis & Mizen, 2000). At the same time, financial markets in which money is the single or dominant commodity appear not to function optimally. In this monograph, we have highlighted possible cognitive biases (strengthened by affective, social, and cultural/institutional influences) that may account for this, including a changing subjective value of money due to reference-point shifts, limited or biased information search, misperceptions of inflation (i.e., the money illusion) or changes in the money unit, asymmetrical risk attitudes, irresponsible risk taking, short-sighted time discounting of monetary gains and losses, and mental decoupling of repayment of loans and benefits of credit-financed products. If common boundedly rational or irrational behavior by many people (in contrast to

individuals alone) result from how markets function and to some extent cause market anomalies and financial crises, then changing the markets to eliminate these behaviors should be important. Economists believe that if the market does not automatically correct irrational behavior (as stock markets seem not to do; e.g., Shleifer, 2000), incentives would teach people to act rationally (Zwick, Erev, & Budescu, 1999). Unfortunately, empirical evidence fails to provide solid support for this belief (Camerer & Hogarth, 1999). Cognitive biases, affective influences, and social influences may be reduced but are in general not eliminated. Cultural and institutional influences may be even more difficult to change (Juravle & Lewis, 2008, 2009; Lewis & Juravle, in press). On the other hand, as we have suggested, starting with children in schools, teaching people about the economy and educating them in financial management may go some way toward achieving the goal (Lea, Webley, & Walker, 1995; Leiser, Sevón, & Lévy, 1990; Webley & Nyhus, 2006).

The current worldwide waves of deregulation of formerly state-governed monopoly markets seem to reflect the belief that free markets solve many of the society's problems—including perhaps those that the free markets themselves create. However, we suggest that markets do not themselves correct biases, nor does incentivizing rational behavior. Whether markets should be reregulated to take this into account is nevertheless a controversial issue. Do improved information to consumers and decision aids make deregulated financial markets work better? In general, deregulation of markets in conjunction with more technologically advanced production has led to an increase, sometimes a tremendous increase, in alternatives offered to consumers—for many, a higher number of alternatives than desired (Schwartz, 2004). An extreme example is the new Swedish pension scheme requiring citizens to choose five equities among more than 500 alternatives (Cronquist & Thaler, 2004; Hedesström et al., 2004). It is no wonder that close to a majority choose a default option. Hedesström et al. (2004, 2007) showed that citizens who did not choose this default option used sensible heuristics in making their choices but that they did not effectively diversify risk. In another study (Hedesström et al., 2006), it was shown that effective risk diversification was possible to teach. An even better method of aiding citizens' decisions may be to present a limited number of portfolios together with assessments of their expected risks and returns. The citizens would still have the option to construct their own portfolios. Other ways of reducing the number of effective choice alternatives, in this example and in other similar cases, would be to group the alternatives on the basis of similarity (Fox, Bardolet, et al., 2005; Fox, Ratner, et al., 2005). Additional research and ideas are needed here.

Similar problems are abundant in credit markets, in which people are reluctant to search information about credit. For instance, Hoelzl et al. (2009) found that people overestimate their capability to deal with a loan in the long run. It has furthermore been demonstrated that the form and complexity of credit information influence whether the costs are anticipated correctly (Bertrand et al., 2005). Therefore, credit lenders

may need to be mandated to improve their information to credit users at the time of credit take-up. Another possibility that promises to be more effective is to stipulate that people wanting credit take out credit-repayment insurance. Such payback protection methods were examined by Ranyard et al. (2001) and McHugh and Ranyard (2009). Interestingly, these researchers also observed a spillover effect of improved risk management by credit users.

We have illuminated some of the consequences that financial crises and economic recessions seem to have for people. Sensible ways of coping have been observed (van Raaij & Eilander, 1983). People may still need to be taught improved budgeting and mental accounting (Thaler, 1999) techniques to make them aware of their expenses and ways to curtail their spending by systematically taking account of it. Unfortunately, the use of credit cards does not facilitate mental accounting and should for this reason be discouraged. Some banks now offer Web-based (mental) accounting facilities. We see this as a desirable development and an expression of increased responsibility on the part of those financial institutions. All financial institutions should seriously consider these and other means to regain society's and customers' trust.

In this monograph we did not address the question of what happens to people who fail to cope with economic hardship or what happens to people who slide into problem debt. It is established that in affluent societies, income increases have less than proportional impact on life satisfaction (Diener & Seligman, 2004). Changing their lifestyle (made possible by possessions of durables) is apparently the last change people want to make if their income is reduced (van Raaij & Eilander, 1983). This is an indication of the fact that, even in affluent societies, the relationship between life satisfaction and income may be stronger in times of financial crises and economic recessions. A policy-relevant insight is that increasing material wealth would influence life satisfaction less than would preventing material wealth from decreasing.

An even broader overarching issue is how to strike a balance between an economic-political system in which the government intervenes to redress market failures and another in which the interference of government is kept to a minimum as the markets do their good work. We argue that, even though in a democracy governments should reflect the preferences of voters, through its policies a government shapes organizational cultures as well as attitudes and values of citizens.

## Notes

1. A meta-analysis by Byrnes, Miller, and Shafer (1999) shows that men are generally more risk taking than women.
2. Amos Tversky died in 1996.
3. For a comprehensive exposition of terms used in finance and their definitions, the reader is referred to the *Oxford Dictionary of Finance and Banking* (2005). Our terminology is no more precise than needed. We use *stocks*, *stock shares*, or *equities* to refer to owner shares offered by companies for sale to investors in stock markets. By *trading* we refer to economic transactions resulting in stock shares changing owners. We use the term *stock returns*

- to include both dividends issued by companies and changes in stock (share) prices. Occasionally we refer to some other financial instruments available to investors, including (interest-bearing) bonds and various types of funds. *Portfolio* refers to a mix of stocks in different companies. *Fund* is a portfolio managed by a financial institution on behalf of a stock owner who is charged for the service. *Investors* refers to individuals who invest for themselves or are employed by financial institutions investing on behalf of others. Financial institutions are also referred to as *institutional investors*—examples include pension funds or insurance companies.
4. A basic tenet of efficient-market theory is that, in the absence of non-expert or “noise” traders, stock prices reflect all available information. It follows that the prices are the best estimates of the fundamental value of the stocks—that is, their present value, taking into account what they will be worth in the future. Thus, there are no underpriced stocks to buy or overpriced stocks to sell, as prices stay in equilibrium in the absence of new information about their fundamental values (such as, for instance, company financial reports) and only change when such information appears. Since new information affecting stock prices tends to appear at random, it follows that the prices change randomly—referred to as a “random walk.” The random-walk hypothesis implies that future stock returns are entirely unpredictable from past stock prices or any public information. Not even inside information is useful for prediction, as it will quickly leak out.
  5. DeBondt (2008) identifies several other market anomalies. We focus here on a subset in which it appears reasonably clear that psychological principles of judgment and decision making play a role. It is also clear that overreaction to news, the disposition effect, and reactions to share splits qualify as anomalies, as they cause deviations of share prices from fundamental values. As we argue later, these anomalies reinforced by affective and social influences also have the potential to seriously destabilize stock markets.
  6. Note that this is objectively consistent with a definition of risk as probability. But are people averse to risk or loss when facing volatility? An experiment by Duxbury and Summers (2004) showed that volatility induces loss aversion rather than risk aversion.
  7. Funds were used instead of stocks because the aim was to simulate the choice of funds in the Swedish Premium Pension Scheme. Even though funds are in themselves risk-diversified portfolios, a selection of several funds still needs to be risk diversified.
  8. In the words of Jesse Livermore, a legendary trader on Wall Street in the 1920s who earned an incredible fortune, lost it all, and committed suicide, “There are only two emotions in the market, hope and fear—the only problem is you hope when you should fear and fear when you should hope” (Lefèvre, 2005, p. v). In the *Saturday Evening Post*, journalist Edwin Lefèvre published interviews with an investor on Wall Street called Lawrence (Larry) Livingstone, believed to be a pseudonym for Livermore. These interviews appear in the book *Reminiscences of a Stock Operator* (Lefèvre, 2005, is a new edition) that contains many pieces of valuable advice and is considered a “must-read classic” for investors.
  9. As pointed out by Västfjäll and Gärling (2002), in the affect space defined by the orthogonal dimensions of valence and activation, this is not a single dimension but varies from high valence and activation to neutral and from neutral to low valence and high activation.
  10. It is interesting to note that the renowned investor George Soros (Soros, 1987) claims to have made his fortune by betting not on fundamental values (arbitrage) but on anticipated herding.

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