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Psychology, Financial Decision Making, and Financial Crises

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SUMMARY – *It is understandable in times of the current financial crisis that people ask how this could happen. Since 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 this and what is the evidence? This article reviews, evaluates, and discusses primarily psychological research which has the potential of increasing the understanding of both psychological antecedents and consequences of financial crises. It also highlights important topics where more psychological research is needed to advance this understanding.*

In general people individually use their cognitive and other resources in sensible ways, and collectively they have developed procedures that effectively regulate economic and other transactions. It is likewise true that sometimes some demands are beyond people's capacity, individually as well as collectively. It is therefore essential that scientific knowledge of people's cognitive and other limitations is brought to bear on the issue of how to prevent such overtaxing demands. Arguably, financial markets such as those for stocks and credit overtax actors' capacity to make rational judgments and decisions. In product markets with full competition, prices represent the true value of the products offered. This does however not seem to hold in stock markets where stock prices, due to excessive trading, are more volatile than they should be if reflecting the true value of the stocks. Psychological explanations 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. This is however not what evidence indicates. 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 de-stabilized stock markets, experts are less likely to loose money than 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 back the installment rates. Global credit excesses in general, and the current sub-prime 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 by installment rates or paying the price 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. In contrast to search of information about the product, only a small percentage of credit users search extensively for credit information prior to credit take up. The probability of search increases with the borrowed amount, the number of previously experienced debts, higher income, educational level, and 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 with 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 are shrinking 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. Since the last implies life-style 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 younger people without such an 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 counter-measures is however not easy. There are important differences between people in financial knowledge 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 needed to function in a complex financial world, where they increasingly become responsible themselves and can rely less on the government for protection and support.

A detrimental consequence of financial crises is the loss of trust in financial institutions. Seven determinants of trust (and regaining trust) in financial institutions are discernible: competence, stability, integrity, benevolence, transparency, value congruence, and reputation. The first four are necessary pre-conditions 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 on their own. This results in "momentum buying" such that the real value becomes irrelevant. One may ask how financial institutions can be changed to become more responsible. An example is the inclusion of long-term environmental, social, and corporate governance considerations within investment processes to achieve both financial and social outcomes. This requires removal or change of conventions that favour remuneration systems based on short-term performance. Making required cultural shifts is however no easy matter but because people in any group, including those in financial institutions, are not entirely homogeneous, minorities of open-minded, socially responsible thinkers exist – and now perhaps is the time 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

In times of financial crisis such as the world now experiences, it is understandable that the people ask how this could happen. Since the market actors appear irrational, it is also understandable that people – lay people and experts alike – believe that psychological factors play 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" but represent the way people process information and act upon it. The contribution of psychology is to find the regularities – heuristics and biases – in people's perceptions and decisions that account for economic behavior. The late Herbert Simon, Ph.D. in Political Science, Professor of Psychology at Carnegie-Mellon University and in 1978 Nobel laureate in economics, argued that people are *boundedly rational* (Simon, 1956, 1982, 1990). Not surprisingly considering the long evolutionary history of human beings, people use their resources in sensible ways to adjust to the prevailing situational demands. Such demands to judge probabilities and to make decisions are however occasionally beyond their capacity. Many contemporary scholars in behavioural 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 scholar in psychology to empirically show this (Kahneman, 2003a, 2003b; Laibson & Zeckhausen, 1998).

The aim of this article is to review, evaluate, and discuss, primarily psychological research which has the potential of increasing the understanding of both psychological antecedents and consequences of financial behavior and thus of financial crises. We hope in this way to be able to complement economists' analyses of the current as well as previous financial crises (see Rapp, 2009, for review). We will also highlight important topics that call for more psychological research to further advance understanding.

In financial markets actors take risks as well as 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 help to understand bounded rationality in financial markets. The following two sections comprise the primary foci of the article, 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. 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, research is reviewed addressing psychological accounts of decisions prior to credit take up, 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, we review in a subsequent section 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, in the new systems the pension 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 behaviour, including spending,

saving, and consumption. As we note in a following section, a serious consequence is also 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 but, more importantly, what they can and need to do to prevent or normalize the economy after a crisis. This section is necessarily speculative but is included to highlight some of the shortcomings of research that focuses exclusively on individual behaviour to understand societal consequences.

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 since 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 towards future benefits, whereas stimulating risk taking is more present-time and experience oriented (Zaleskiewicz, 2001).

A distinction also needs to be made between *risk* defined as a 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, and *risk events* defined as low-probability negative outcomes (Slovic, 1987, 2001; Vlek & Stallen, 1980). According to the former definition, risk or probability is a quantification of the likelihood of a decision outcome. The term *uncertainty* is instead used if an explicit quantification of the probability is not made. In a lottery the probabilities may be known (although few buyers of lottery tickets are likely to want to know them), whereas in a financial market 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 risk events include health, social, ethical and recreational. 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).

(Economic) risk taking 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 loosing), 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 the 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 than 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 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, 1985, 2001). One of these biases particularly highlighted in financial markets is *overconfidence* (Glaser, Nöth, & Weber, 2004) that 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 (Weinstein, 1980) about the future. 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, in a choice situation, 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. Sharma, Alford, Bhuian, and Pelton (2009) recently proposed a higher-order model of (consumer) risk propensity. Risk propensity is in this model 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 risk preference. 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, including the financial domain, distinguishing in that domain between investing and gambling. They found that the perception of benefits and risk, and not risk attitude, are related to gender and domain differences in risk taking. Recently, Meertens and Lion (2008) developed a risk propensity scale to discern risk avoiders from risk takers, but they did not distinguish different domains of risk taking.

Risk-avoiding decision makers are more likely 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 gain 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, 1992).

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, 1972). 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 success and failure are attributed to the actions of the decision makers themselves 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 upside risky effects 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 downside risky effects of their financial products.

Socio-Demographic Factors

In order to explain general effects of socio-demographic factors on risk taking, an evolutionary perspective has been adopted (Wang, Kruger, & Wilke, 2009). Thus, women are less risk taking than men[1]. Parenthood seems to reduce risk taking. Older people show a lower risk propensity.

Whether the effects of socio-demographic factors attributed to evolution pertains to economic risk taking is however an unresolved issue. Yet, women are found to be more risk averse in making financial decisions than 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). Furthermore, 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 non-identical 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 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 high need for arousal and therefore tend to take more and larger risks than 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 extravert and open to new experiences than older people, and this may partly explain the age effect 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 are either 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, focussing 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, 2003). 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 towards 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 less or smaller financial risks.

Confidence

Another factor is confidence, that is optimism vs. pessimism with regard to 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 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 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 risk perception and risk propensity that determines risk taking. It has a strong relationship with entrepreneurship. Entrepreneurs are more optimistic and risk-tolerant than non-entrepreneurs. The financial behavior of optimists will be more risk seeking than the financial behavior of pessimists. Dispositional optimists expect more positive outcomes of their investments and they envision less 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 is modified by socio-demographic, 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 less 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 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. In financial markets money plays a dominant role. Therefore, differences between the subjective and nominal *value of money* is one such factor that will be discussed below. A second factor that will be discussed 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 to be discussed is *loss aversion*, that is 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") stated: "I love money more than the things it can buy!" This highlights the subjective character of the value of money. However, normally in people's minds, the value of money does not differ this clearly from its purchasing power. Yet, there are several deviations from the nominal value of money that question its status as a "unit of account" (Lewis & Mizen, 2000).

Bernoulli (1738/1954) introduced the notion that money has a subjective value that differs from its nominal value. In a game of tossing a balanced coin, the player first designates tails or heads as winning. Then the player is invited to make a number of tosses until a winning tail or head comes up. If this occurs in the first toss, the player wins $2X$ with the probability of $1/2$, if the winning tail or head comes up for the first time in the second toss the player wins 2^2X with the probability of $(1/2)^2$, if the winning tail or head comes up for the first time in the third toss the player wins 2^2X^3 with the probability of $(1/2)^3$, and so forth. The expected value of this game (the average outcome if played an infinite number of times) is infinity. Despite the possibility to earn an infinite amount of money in the long run, people are still only willing to pay a small amount for the opportunity to play the game! This observation goes under the name of the St. Petersburg paradox. If the value of money increases strictly monotonically with objective value but at a diminishing rate, it would make the expected value of the game finite. Bernoulli therefore proposed that a concave (logarithmic) value function is a possible account.

Galanter (1962) employed psychophysical scaling methods with the aim of measuring the subjective value of money. In an experiment participants were asked to judge how much money they would require to make them twice as happy compared to receiving US$ 10 (or 100 or 1000 in different groups). A power function of the form $y = ax^b$ provided a good fit to the data for an exponent of approximately 0.50 (which is close to a logarithmic function). The

exponent is a measure of the curvature of the function (the changing rate of increase in subjective value with increasing objective value), the multiplicative constant *a* a measure of the steepness of the function (the average rate of increase with increasing objective value). Another experiment (Galanter, 1990) investigated subjective value of money for losses. Here participants were asked whether they would be more or less than twice as upset for a loss of US$ 5 (or 50 or 500) than a loss of US$ 10 (or 100 or 1000). The same power function with a slightly larger exponent fitted the results. In contrast to this, Tversky and Kahneman (1992) showed that the exponent of the power function for gains did not differ from the exponent of the power function for losses, but that the multiplicative constant *a* (the steepness of the function) was approximately twice as large for losses than for gains.

The concave form of the value function (as illustrated in Figure 1 below), 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 form. Is there any similar mechanism that can account for the value function of money? Stewart, Chater, and Brown (2006) proposed a theory positing that the evaluation of a monetary value is made by comparing it with sampled values from long-term memory. The concave value function is then taken to reflect the (observed) fact that the frequency of encountering monetary amounts in people's daily lives follows a concave function. Another possibility to explain diminishing sensitivity to increasing monetary amounts, suggested by Linville and Fischer (1991), is that people have limited gain-savoring resources. 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, its (temporary) higher value would represent a discontinuity of the value function. An experimental demonstration is the "break-even" effect (Thaler & Johnson, 1992) showing that 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 purchasing power experienced in markets for goods and services. An opportunity to investigate how the value of money in this way may be 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, in monthly surveys conducted before and after the transition in Austria and Portugal, Marques and Dehaene (2004) attempted to distinguish between a re-scaling hypothesis (conversion from the domestic currency to the euro by multiplication by a multiple or fraction) and a re-learning hypothesis (re-learning product prices in the new currency). Participants estimated the Euro prices of a sample of selected products as well as how frequently they purchased these products. Indicating that the value of the Euro was learned, in both Austria and Portugal the variability of the price estimates decreased with time, approaching the variability in price estimates in the respective domestic currencies before the transition. The fact that in Austria the variability of the price estimates decreased faster for more frequently than for less frequently purchased products was taken as evidence favouring 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 re-scaling 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. Re-scaling was more frequent for exceptional purchases, for instance, of expensive durable goods.

Extending the re-learning 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, then in a second stage the inverse of the product prices is used to infer how much one can purchase for the money. Juliusson et al. (2005) demonstrated that this is an easy task, less easy however if the inverse is a fraction than if it is a multiple, and even 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 of money and focussing 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 or Face Value Illusion (e.g., Gamble, 2007; Raghubir & Srivastava, 2002) denoting that a change in exchange rate influences price evaluations. Thus, a price for the same product in Euro is perceived as cheaper than the price in some other currency (such as the Italian Lire) 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 Euro) than 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 over-generalized. An illustrative example is that in general (but not always) two cakes contain more calories than one cake.

The effect of the nominal representation of money (the money and face value illusions) also reflects a more general psychological phenomenon where an easily accessible attribute affects judgments and decision making (Kahneman, 2003). A distinction is made between intuitive and deliberate judgments. Intuitive judgments are similar to perception in being a fast and immediate response 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 et al. (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 differing in direction and magnitude.

Expectations also seem to play a role. In connection with the Euro changeover, expectations were in many countries 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 to Euro led to a higher value, this was accepted as an accurate outcome. In contrast, conversions leading to an unexpected outcome were double-checked. This resulted in a bias towards estimates of higher prices in Euro than in the nominally larger German Mark.

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 a fixed sum of money, say US$ 10, and the purchase of a lottery ticket offering the opportunity to win 100 times this amount, that is US$ 1000 with a probability of .01. The expected value of the lottery is the multiplication of this probability with 1000 that gives the value of 10. An average of 1 win should thus be expected for an infinite number of repeated random samples of 100 lottery tickets. Obviously, the cost of the lottery ticket must also be taken into account. Another related construct introduced in expected utility theory is *risk attitude*. Being indifferent between US$ 10 and the probability of .01 of winning US$ 1000 is referred to as a *neutral* risk attitude. A preference for US$ 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 1000 and thus preferred. If it 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 theory of what is referred to as non-expected or generalized utility theories (Camerer, 1989, 2000). The theory rendered Kahneman the Nobel prize in economics in 2002[2]. In expected utility theory (incorporated in portfolio theory proposed by Markowitz, 1959, referred to in the next section) a choice alternative is evaluated by evaluating 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. In Prospect Theory the evaluations are made of the difference between an outcome and a *reference point*. For instance, if a stock share increases (decreases) in price from the purchase price, the change is assumed to be evaluated as a gain (loss). 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 Figure 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 will be described 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 gains. Thus, referred to as *loss aversion*, the same decrease will be evaluated as worse if it is coded as a loss than if it is coded as a reduced gain.

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 Figure 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 more parallel with the abscissa implying that 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 above, 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 vs. 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 both purchase lottery tickets and insurances.

In Fox and Tversky (1998) Prospect Theory is generalized to uncertainty, that is to conditions where the probability of the outcome is not known, common in real life, including stock and credit markets. As Edwards (1954) proposed in subjective expected utility theory, inputs to the decision weights (see Figure 1) are judged probabilities rather than objective probabilities. In this way, 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) was proposed.

Framing

Kahneman and Tversky (1979) introduced framing by means of 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 above, the former would lead to choices of riskier alternatives than 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. In Tversky and Kahneman (1981) framing was extended to several other phenomena. This has also been the case in subsequent research (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 (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.

Another more general means of influencing reference points is through multi-period experiments. 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 independently of the previous. 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 (Linville & Fischer, 1991), Thaler and Johnson (1990) proposed that the editing phase posit in Prospect Theory is partly governed by cognitive simplification, partly by hedonic principles (labelled hedonic editing), that is the motivation to feel good. Hedonic editing is an instance of *mood regulation* that in the next section will be discussed 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, p. 456) 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." As an empirical example, in presenting different scenarios in an experiment, it was found that fewer participants would buy a new theater ticket to replace a lost one than the number of participants who would 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 a ticket were evaluated in separate accounts.

In Tversky and Kahneman (1981) the coding of outcomes in mental accounts is specific to a decision to be made. In contrast, the mental accounts referred to by Shefrin and Thaler (1988) in their Behavioral Life-Cycle Theory are instead a priori held mental accounts that are part of people's financial knowledge and therefore presumably higher-order, more stable cognitive structures. According to the theory, people categorize monetary assets in three mental accounts, current income, current assets, and future income. Shefrin and Thaler (1988) did not argue that these three accounts are exhaustive, but that they are the most basic and general ones. The current asset account may, for instance, be divided into sub-accounts, and different households may use different sub-accounts. Such sub-accounts 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 expected to be higher in the future, and 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 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 current assets, current income, and future income 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 the internal conflict, within an individual, 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 co-existing doer is assumed to be myopic and impulsive, striving towards 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 other 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 that people 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 Figure 1). As noted by Camerer (2005), loss aversion has been evoked 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 employing undergraduates, Kahneman et al. (1990) found a substantial difference in selling and buying prices that dramatically reduced the number of transactions. As one should expect if loss aversion is the sole explanation, the endowment effect appears to be immediate, although its strength increases with the length of possession of the good and decreases with the similarity between the endowed goods and the goods not endowned (Strahilevitz & Loewenstein, 1998). Furthemore, 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 affect is important. The endowment effect is reduced if a negative mood is induced before the good is acquired. Carman 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 carried out themselves, 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 the 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 being outside 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 (non-linear value function of money, money illusion, 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 valued 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 dusts.

BEHAVIOR IN STOCK MARKETS

In stock markets, investors trade stock shares[3]. Why do they trade? A rational analysis suggests that investors only trade if they differ from each other, for instance in liquidity needs, risk perception or attitude, or knowledge. A general belief is however that these differences are not sufficient to explain the high trading volumes observed in stock markets (Odean, 1999). A reason may be that stock share prices are too low or too high. According to efficient market theory proposed in financial economics (Fama, 1970)[4], if the trading prices of stocks deviate from their fundamental value due to "noise" traders, it will increase trading by rational investors whose trading eventually will correct the prices. This is labelled arbitrage. However, empirical observations questioning the validity of efficient market theory include that arbitrage is limited in nullifying the impact of noise traders (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. Arbitrageurs may for this reason even follow noise traders in buying "glamour" 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 popular 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 confounding which plagues interpretations of market observations. Yet, laboratory experiments also raise issues of external validity. A fruitful approach would be to conduct experiments that with high fidelity simulate investor behavior in actual stock markets (Plot & Smith, 2008).

In this section we will highlight psychological research, in particular experimental research, with 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 (2006). Another valuable source is the three-volume *Handbook of 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 overriden (Fehr & Schmitt, 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, in press). As further elaborated in Table 2 and the accompanying text in a later section, an important question is what influences on value priorities a society exerts and can exert on financial institutions and individual investors.

We start in the first subsection with a set of violations of rational investments by both expert and lay people acting in stock markets, which are identified as market anomalies[5] leading to excessive trading volumes and stock price volatility not reflecting fundamental values. These include *overreactions to news*, *disposition effect*, and *reactions to splits of stock shares*. Another anomaly is *naïve risk diversification* leading to unintended higher portfolio risk. We review research attempting to identify cognitive biases that singly or together account for the identified market anomalies, as shown in Figure 3 including overconfidence, optimism bias, money illusion, asymmetric risk attitudes, framing, loss aversion, biased information search, mental accounting, diversification heuristic, and co-variation neglect. 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 in accounting for market booms and busts. These effects are reinforced by social influences, that is the influence investors exert on each other, a phenomenon referred to as *herding*. In the third and last subsection research on social influences in stock markets will be reviewed.

Cognitive Biases

Overreactions to News

News is assumed to be the only factor affecting stock prices (cf. footnote 4). Bad news includes falling stock prices, negative company financial reports (also referred to as "fundamentals"), and 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. Extrapolation is an overreaction because in general empirical evidence supports that increasing or decreasing stock prices revert back (referred to as "mean reversion"). For instance, DeBondt and Thaler (1985, 1987) found that the future performance of stocks that in a previous period were extreme losers exceeded performance of stocks that in the previous period were 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-Baysian conservatism and is evoked by Shleifer (2000) as the explanation of underreaction.

Andreasson (1988, 1990) notes that news causes old information to be temporarily underweighed. 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. Experimental evidence was presented questioning the generality of the overreaction-to-news effect. News does not simply make investors ignore trends in stock prices. News also needs to be salient to have an impact.

In additional research, Schachter, Hood, Gerin, Andreasson, and Rennert (1985) show that volatility in stock prices not only depends on economic events (i.e., extrapolation of price trends) but news about events with potential effects on the real economy, including outcomes of political elections, disasters, and other. 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 for 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 company 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, 1998). It 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 (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 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 aversive when selling winners, prefering a certain gain (selling the stock) to an uncertain gain (holding the stock), but risk seeking when selling losers, prefering 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 participants after each period were forced to sell the shares they owned, 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 favourable they search for definite such 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 framed as a larger or smaller gain or loss, or as a loss instead of a gain or the reverse.

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 aspired 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 $18,000 is acceptable (two different *aspiration prices*). The investor *expects* to sell at $16,000 and has on similar occasions in the past sold at $14,000 (*history*). If the selling price turns out to be $12,000, this is obviously a gain compared to the purchase price as a reference point but a loss compared to the other potential reference points. Will an average of these different reference points become the reference point, possibly weighed by salience? In the experiment by Weber and Camerer (1998) described above, 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, in order to correctly infer the value of the trade, investors should take into account changes in the value of money over time (i.e., inflation). As noted in the preceding section in discussing the money illusion (e.g., Fehr & Tyran, 2001; Shafir et al., 1997), unless inflation is very high, the nominal representation of money have 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. A crash is then likely to materialize due to stock prices starting to fall in an uncontrolled way.

Reactions to Splits of Stock Shares

It is not uncommon after a sustained rise or fall of prices of stocks in companies that they 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, 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 since 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 that maintain that investors are rational have been proposed of the effects of splits and reverse splits. 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 as well as on the actual day of its 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 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 since, in line with the money illusion (Fehr & Tyran, 2001; Shafir et al., 1997), the nominal representation of money may influence people's perception of the real value of money. It was accordingly hypothesized that a split, and a reverse split, should affect trading, reflected in the participants' willingness to buy or sell. As a result of the lower (higher) nominal representation following a split (reverse split), buyers would perceive the share prices to be more or less valuable. It is not clear however whether this leads to a higher or lower willingness to buy. A momentum investment strategy (Hong & Stein, 1998) 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 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 share 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.

Naïve Risk Diversification

Investors construct stock portfolios by buying stocks in different companies. Their goal is to diversify risk, that is to avoid placing "all eggs in the same basket." Risk is defined as volatility of stock returns[6]. A stock with high volatility increases the probability of large gains but also of large losses compared to a stock with low volatility. An optimal portfolio should maximize return for a chosen risk level and other costs (Markowitz, 1959). An important factor to take into account is how stock returns are expected to co-vary in the future. Risk is reduced by selecting different stocks to a portfolio only if their returns do not co-vary such that they increase or decrease at the same time.

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 (bonds) and risky investment alternatives (stocks). Drawing on Lopes (1987) who conjectured that the hope of gaining and the fear of loosing 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.

In pension schemes where citizens choose between bonds and stock funds and between different stock funds, empirical studies (Benartzi & Thaler, 2001; Hedesström, Svedsäter, & Gärling, 2004, 2007) show that equal amounts are allocated to the alternatives offered. This is referred to as the 1/*n* heuristic, also 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 by which they distribute the resource evenly across all options, insufficiently adjusting in accordance with their beliefs and preferences. In a series of experiments, Fox, Ratner, and Lieb (2005) demonstrated how allocations as a consequence 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, all stocks are considered at the same time. The co-variation among stock returns over time is then 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), consisting of stocks that vary 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 with the aspiration of becoming wealthy (hope of gaining). By segregating the investments in layers of stocks, co-variation among stock returns is neglected. As an illustration, investors frequently select domestic rather than foreign stocks to their portfolios believing this incurs less risk (French & Poterba, 1991). Yet, this "home bias" neglects that domestic stock returns are more likely to co-vary 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 employing snacks and lottery tickets have shown that a variety-inducing *diversification heuristic* leads to sub-optimal choices (e.g., Read & Loewenstein, 1995), for instance that 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 since more diversification is often better than less diversification (Read, Antonides, van den Ouden, & Trienekens, 2001).

While using a diversification heuristic when constructing stock portfolios induces variety among the stocks, the use of the heuristic may not reduce risk to the extent that investors intend because the co-variation among the expected stock returns is neglected. Investors may thus not fully understand why diversification reduces portfolio risk and incorrectly believe that any multiple-stock portfolio, irrespective of its co-variance structure, will be risk-diversified. This is possibly attributable to a generally poor grasp of the concept of co-variation. The human capacity to assess co-variation has been extensively investigated in judgment and decision making research (see Shanks, 2004, for a review). Consistent findings demonstrate that people act naïvely when computing co-variation (typically between discrete variables presented in 2 by 2 contingency tables), and that judgments of co-variation 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) co-vary. Comparatively little experimental research has investigated judgments of co-variation 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, asking them 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 were taken into account, allocations to each of the stocks should differ between the groups. As no significant differences were found, it was concluded that the participants exhibited co-variation neglect. When repeating the experiment with business students, subjecting them to a possible loss and allowing them the possibility to copy each other's actions, participants did however respond adequately to changes in the correlation coefficient (Kroll & Levy, 1992).

In the Swedish Premium Pension Scheme, where citizens construct their own mutual fund portfolios, a brochure displays the funds' returns for each of the five preceding years. In analyzing actual as well as fictitious investment choices, Hedesström et al. (2004, 2007) found indications of naïve risk diversification, questioning the investors' ability to take into account co-variation among returns. The typical choice (among those who did not choose a default fund) was to include as many funds as possible (5) in the portfolio. Regardless of how many funds were chosen, the most typical was to select 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. However, 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. There are some indications that they do not. Although stocks from one country are likely to co-vary more than equivalent stocks from different countries, almost half (48.2%) of the total invested amount in the Swedish Premium Pension Scheme was invested in Swedish stocks (Cronquist & Thaler, 2004). Thus, investors may have failed to realize that diversifying across funds investing in Sweden does not reduce risk as effectively as diversifying across funds investing in different countries. There are also other examples possibly resulting from a naïve 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. Although it is therefore difficult to conceive of any good reasons to combine life-cycle funds with other funds, 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 co-variation 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[7] returns in 10 years time on investments of SEK 10,000 (about US$700). For one more risky fund (A) the returns were more volatile than for another less risky fund (B). The expected mean returns were the same. In one within-group condition the fund returns were negatively correlated, in another 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, 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, naïve 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 co-variation for risk diversification had the effect to increase effective risk diversification (from 34.4% to 46.9%) and reduce naïve 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 naïve 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 naïve 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. Co-variation among future stock returns is difficult to forecast and may after all not be that important to take into account (Read et al., 2001).

Affective Influences

As illustrated in Figure 4, judgment and decision making are influenced by pre-decisional affective states such as *current mood* (referred to as *incidental* affective influences – that is affect unrelated to but experienced while making a judgment or decision, *anticipatory affect* ("dread", "optimism-pessimism") and *anticipated affect* associated with the decision outcome ("elation", "disappointment", "regret") (referred to as *integral* affective influences) (Peters, Västfjäll, Gärling, & Slovic, 2006).

Current mood is commonly conceptualized as a non-transient discrete affective state varying in two orthogonal dimensions (Russell, 2003; Russell & Feldman Barret, 1999; Yik, Russell, & Feldman Barret, 1999), valence that varies from positive to negative and activation that varies from activated to de-activated. 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 ("relaxed") induces a less thorough decision making process than a current mood low on valence and high on activation ("distressed") (Schwarz, 2000). A worse outcome results if the decision would have benefitted from more thorough processing of the available information. Yet, 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, in a majority of 26 international stock markets a negative relationship was observed between cloudy weather and stock returns.

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 risk (Mano, 1992), possibly because they want a positive outcome to repair their negative mood. The disposition effect observed in stock

markets (Sheffrin & 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). This suggests that 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 raise to anticipatory affects of hope, fear, or even despair that influence stock investments. Mood regulation is still the driver of the affective influences since 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 for selling stocks, Piñón and Gärling (2004) conducted experiments in which pictures selected from the International Affective Picture System (IAPS; Bradley & Lang, 1999) were used in 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 cosy puppies, whereas the picture shown to the participants in the negative mood condition displayed a crying under-nourished child. Participants choose 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 choose to sell, whereas in a negative mood the participants took into account the prior loss, adopted a loss frame and choose not to sell. Thus, the disposition effect (keeping losers) was observed only in a negative mood. The general implication is that the disposition effect is related to both incidental and integral affects[8].

This interpretation of the results was however challenged by another experiment. Other groups of undergraduates were asked to sell or not sell a stock at a loss after that they had earned money on other stocks. Taking the previous gain into account, they would come out black even though they decided to choose 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, Wang Erber, and Poe (2004), mood regulation in a positive mood is hypothesized to involve selective attention, requiring minimal information processing that results in ignorance of any prior event, thus adopting either the gain or loss frames induced by the current choice. In contrast, a negative mood is hypothesized to induce re-appraisals requiring systematic processing of available information.

An affective dimension[9] varying from elation to disappointment is frequently used to characterize affect outcomes of decisions (Mellers, 2000). In previous research (Zeelenberg, 1999) it has been shown that a negative outcome of a chosen alternative causes disappointment, whereas a positive outcome of a non-chosen alternative causes regret of not having chosen this alternative. Västfjäll, Gärling, and Kleiner (2004) conceived of *anticipated* affect of a decision as a cognitive representation of valence and activation of affect experienced as the decision outcome. It was assumed to frequently play an important role, in particular when cost-benefit considerations are de-emphasized. The implication is that anticipated affect functions as a heuristic that simplifies choices. Such an *affect heuristic* may be triggered by type of decision outcome (e.g. romantic vs. monetary outcomes, Rottenstreich & Hsee, 2001), time pressure, unaccessible 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 vs. 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 resulting in elation, anticipated displeasure from a loss was amplified resulting in disappointment.

What role does anticipated affect play for stock investments? In an experiment conducted by MacGregor, Slovic, Dreman, and Berry (2000), a sample of undergraduates taking a course in investment banking were first asked to rate industrial sectors with respect to several attributes reflecting associated positive vs. negative affect. They were also asked to similarly rate images aroused by thinking about the industrial sectors. It was thus established that some industrial sectors elicit strong positive or negative affect. Participants were more likely to buy stocks in the former than in the latter. They believed that the expected financial performance of the purchased stocks were better but this was not verified 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 risk performed under time pressure. The correlation is generally expected to be positive, that is benefits would increase with increasing risk, which was the case when there was no time pressure, so that 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) accordingly defines herding as investors' tendency to follow each other into and out of the same 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, social influences by others may also be *indirect*. Four main causes of indirect social influences 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" where investors, independently of their private information, use the observations of choices made by others preceding them to make the same choice (Bikchandani, Hirshleifer, & Welch, 1992), or "reputational herding" referring to that choices that deviate from others' choices impose costs for investors in terms of an impaired reputation (Scharfstein & Stein, 1990). The possible causes of herding are not mutually exclusive. Thus, 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 have been reached in research based on analyses of investor behavior in stock markets (see review by Hirshleifer

& Teoh, 2003)[10]. While some studies confirm the existence of herding (e.g., Guedj & Bouchaud, 2005; Sias, 2004), others do not (e.g., Drehmann, Oechssler, & Roider, 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) assuming that large imbalances between the number of buyers and sellers in stocks are evidence of herding. Studies applying this measure (Grinblatt et al. 1995; Wermers, 1999) show a lower level of herding compared to 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 that others' actions provide 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. 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 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 their 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 by 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 Shilller (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 their private information about the evaluations and choose the same restaurants as the others.

In a typical experiment investigating information cascades (e. g. Anderson & Holt, 1997), participants' task is to predict which of two events (*A* or *B*) would take place. On each trial participants receive a cue (*a* or *b*) corresponding to the events *A* and *B* with a predetermined probability. The cue is private but the prediction is publicly announced, thus participants on each trial receive information about the private cue and the decisions made by the preceding participants. An information cascade occurs when a participant observes two consecutive choices (A, A) and, despite contrary private information (*b*), chooses the same option as the others have chosen (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. Counter-arguments 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 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 theory 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 to people complying 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 that the minority members' arguments are critically evaluated. Another reason for majority influences, consistent with that social influences are informative, is that people who are uncertain about how to act use a "consensus" heuristic implying 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 over-generalized. 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 the systematic component of the changes in stock prices 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. When others (ostensibly consisting of five other participants) made predictions of the stock price that were disclosed to the participants, their predictions had a large influence if they were a consistent majority (four of the others making correlated predictions), but not if they were a consistent 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 in times of excessive uncertainty (high volatility of stock prices), the tendency to follow others would be the strongest. Trends of falling or rising prices are therefore likely to be boosted. This starts a vicious circle. The causes of herding are under such circumstances 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 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 to succeed unconventionally. It is likewise argued that investors who herd are able to share the blame and hide in the herd when making unfavourable 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 favour 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, 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 booms, and terrified during market 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 Figure 2). In doing so herding will aggravate stock price volatility that de-stabilizes the market (Bikchandani & Sharma, 2000; Chari & Koebe, 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 economists (Akerlof & Shiller, 2008; Galbraith, 1955/1997; Krugman, 2009) do at least 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 it appears to be. 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 be less focused on disproving efficient market theory than 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 make a vacation trip, or to purchase clothes or jewellery may not always be possible to do 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 not being able to pay back installment rates and indebtedness. Credit is defined as "granting of goods, services, or money in return for a promise of future payment" (Columbia Encyclopedia, 2001). 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 except mortgage debt.

Driving forces of acquisition of consumer goods without having the necessary financial budget are hedonic values (Gourgé, 2001) as well as an increase in present-time orientation (Wood, 1998). Post-modern societies support the rise of compulsive consumption (Neuner, Raab, & Reisch, 2005; Tokunaga, 1993), facilitated by increasing credit availability. Using credit to buy a property appears to be completely sensible and desirable from an economic perspective. However, a loan is simply a different form of debt, which can lead to over-indebtedness 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 which became apparent in late 2007 and 2008 shows (Krugman, 2009).

Global credit excesses witness to the share in contributing to households' indebtedness that lenders of credit have by offering increasingly more loans without appropriately considering the risk of borrowers to be able to pay back installment rates. With regard to the current sub-prime 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 encouraged borrowers to believe in easy credit payback.

In this section we focus on people's readiness to borrow money in general 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 and so is household bankruptcy as a result of growing consumer credit use. In the US household debt is high (e.g., Maki, 1999; Zhao, 2003), while less people possess saving accounts (Merskin, 1998). In France, the UK, 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).

People are not only prepared to use credit for buying an apartment or house, but they also think that the bank "could pay first" for a vacation trip, jewellery, or furs. 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, but rather is acceptable for acquiring luxury products (e.g., Lunt & Livingstone, 1992; Norton, 1993). The famous quote by Earl Wilson (1907-1987) describes this reality: "Modern man drives a mortgaged car over a bond-financed highway on credit-card gas," whereas 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" (Earl Wilson).

Different sources of credit are also 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 (Morgan & Christen, 2003), 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. The importance of credit cards used as a substitute for cash and checks 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 installment loans and credit card debt. Credit cards serve both as a payment means and 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 being necessary for Internet transactions, and to add-on offerings, such as frequent-use awards, flight-miles, and others. 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 purpose has mostly been observed among less affluent people and people with positive attitudes toward borrowing money (Slocum & Mathews, 1970). The ease to revolve credit by credit cards accounts for a substantial and growing share of consumer debt (Canner & Luckett, 1992).

In people's minds, credit is frequently associated with debt. While the term credit is referred 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 non-essential consumer goods. Lea (1999) defines credit as deferred payment on agreed terms, and distinguishes credit from debt 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, p. 1), "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 counselling – a possible indication that many individuals see their own level of debt as suboptimal."

Debt not only implicates 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 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 with marital conflict (Jeffrey, 2007).

Socio-Demographic and Personality Factors

In economics, credit use has become a topic of interest as credit use co-varies with interest rates and household income. Neoclassical economics conceptualize credit use as utility-maximization by consuming in advance (e.g. Modigliani, 1966, 1986), thus trying to integrate credit use into standard economic theory (e.g. Brito & Hartley, 1995). In contrast to the economic-psychological research (e.g., Hayhoe, Leach, & Turner, 1999; Qi & Yang, 2003; Xiao, Noring, & Anderson, 1995), type of credit used, personal characteristics of credit takers,

and situational circumstances are largely ignored (Frederick, Loewenstein, & O'Donoghue, 2002). Economic-psychological research 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 existing debts, the more likely people are to use a "high rate" credit source, like financing companies (Drecnik Worden & Sullivan, 1987). The most important indicator for which source of credit is 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 groups owning houses resembles that of higher-income groups. They 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 of people with small debts compared to people with serious debts, it was found that personal debt correlated with the financial poverty of those affected (Lea, Webley, & Levine, 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 will-power and lack of self-control techniques to 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 have an important role with regard to people's ability to postpone a purchase or their temptation to buy immediately. As Berns, Laibson, and Loewenstein (2007) note, inter-temporal choices are influenced by individuals' propensity to imagine and experience pleasure and pain in anticipation of a future event, their experienced tensions when they attempt to implement a far-sighted decision in the presence of immediate temptation, and 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 towards 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 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 towards 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' mis-judgments 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 conceptual 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 the credit take up, the second stage the actual credit take up decision, and the third stage phenomena during the repayment period.

Research addressing decisions before credit take up focuses on *motives* and *availability* to obtain credit as well as on *attitudes towards 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 forgo the planned purchase. For instance, after discussing purchasing alternatives and loan conditions with friends, one may consider advice against the planned purchase or loan and come to the conclusion to either save money and buy at a later point of time, or to abstain from buying the good altogether. However, if people decide to use credit and enter the second stage of actual credit take up, they may on the one hand immediately raise a credit, for instance, by signing a previously offered contract combining purchase and credit, or by using a credit card or accepting implicit credit use by late payment. Because people do not necessarily feel like going into debt when purchasing on a credit card but perceive credit card use as purchases from their own funds, such decisions are termed spontaneous decisions about credit use. On the other hand, rather than spontaneously using credit, signing a credit contract may result from deliberate decision making, 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, and measures to prevent from difficulties to pay back credit and over- indebtedness. Also after deliberate decision making with regard to loan alternatives, one may abandon or postpone a purchase until the necessary savings are made – or come to 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, have purchased and possess the commodity or use the service, they need to start paying back installment rates. Payment of installments goes on after experiencing the rewards of the purchased product coupled with the costs of repayment, and may differ from how repayment experiences were predicted at the time of credit take up. Repayment of a loan is likely not to be perceived in the same way across the whole payback period, nor to be perceived in the way anticipated by credit users. Financial hardship may temporarily occur, so that paying back installments becomes difficult, or people may earn more money such that installment rates are easily paid back.

Motives

While credit use is most often perceived as a means to buy without actually having the necessary financial funds, people also use credit although their liquid assets would permit them to buy in cash. In this case, the reasons for credit use may be mainly economic profit optimization or people may decide to take credit and commit to an installment plan with fixed rates 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 serves to improve one's lifestyle (Walker & Parker, 1988). While low-income families have a stronger need to borrow money as a substitute of 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; Morgan & Christen, 2003),

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 play an important role, such as social comparisons resulting in desires to possess what others have. According to the relative income hypothesis (Duesenberry, 1949), people compare themselves with others' consumption habits. If they have less financial resources available to buy goods and use services that others demonstrate to have (Karlsson, Gärling, Dellgran, & Klingander, 2005), they may try to overcome their financial gap by borrowing money. People with lower needs to belong to a social wealthy reference group which are less present-oriented and discount future events less, are less susceptible to credit use (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 lending money (Morgan & Christen, 2003). Social identification with relevant others, social comparison with the desire to belong to particular social categories and to differentiate from others, and to show belongingness by material possessions result in the desire to possess what ingroup members possess. In case 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 the need to identify with relevant others and the importance of "having to be" (e.g., Bernthal, Crockett, & Rose, 2005). Credit gives access to "valorized identity" (Viaud & Roland-Lévy, 2000), and the more optimistic people are, the more likely they are to borrow money (Brown, Taylor, & Wheatley Price, 2005; van Raaij & Gianotten, 1990).

Attitudes and Mental Accounts

People with more positive attitudes towards borrowing money are more likely to use credit and run into debt as compared to people holding negative attitudes (Livingstone & Lunt, 1992). Willingness to use credit is also related to mental accounting (Thaler, 1999). People keep track of their finances by constructing mental accounts. This 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), as well as saving for a buffer or for a desired goal, and 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 over-consumption if budgets are set too high (Heath & Soll, 1996), or self-deception through a decoupling mechanism, that is mental dissociation of payment and consumption (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 that people estimate that they will spend and 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, offering installment billing can also decrease perceived product quality and demand (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 reach 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 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 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. Therefore, they do not seem to think it is necessary (Durkin, 2000). As the most important sources of information, the house bank and personal contacts are mentioned (e.g., Kaynak & Harcar, 2001). If credit card users are offered personal contacts, they are likely to compare more offers than otherwise (Hogarth, Shue, & Hotynski, 2000).

Furthermore, the probability of search seems to increase with the amount borrowed, the amount of previously experienced debts, higher income, educational level, and for credit novices (Chang & Hanna, 1992; Drecnik Worden & Sullivan, 1987). Also negative experiences, such as not obtaining a 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 features are of interest to borrowers, the more extended is the search for information and the more complex the decision (Durkin, 2000; Hogarth, Shue, & Hotynski, 2000).

Reasons for shallow search of information are high search costs, time restrictions, low motivation, and a too complex issue to make possible appropriate assessment of all relevant information (Canner & Luckett, 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 between repayment amounts, loan duration, and total cost. Perry (2008) stresses that people are overconfident with regard to 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 counselling programs. Arguing that many borrowers lack knowledge about financial issues, which is a cause of poor financial decision making, they assume that the acquisition of financial information would lead to better credit handling. It was found that the more patient individuals are, the more likely they are to take part in counselling programs; and the more inpatient, the higher the amounts of credit card debt.

People mostly lack information about the exact costs of credit use, and they neither know 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 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. At the time of credit take up, they found evidence for dual accounting which improves decision quality. 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 the reasons for misperception of loan duration are specific information processing heuristics utilized by credit users and in their time discounting views. With regard to processing heuristics, credit information is either represented in a simple total account or a more complex recurrent, budget period account. According 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, 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 information about monthly and total interest charges was missing.

Decisions about taking the burden of a loan and payback rates, and benefiting from a desired product that can be purchased with borrowed money are intertemporal choices where people need to take into consideration, on the one hand, the rewards of immediate purchasing and using or consuming the product, and on the other hand, sequential installment rates to be paid in the future. At the time of credit take up intertemporal choices regard the benefit of immediate consumption or, if people are patient, postponement of immediate purchase and consumption in the future. In case of impatience, 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 in so far as the value of future benefits as well as future costs is smaller than their value in the present (Ainslie & Haslam, 1992; Frederick et al., 2002). In other words, buying and using or consuming a product immediately rather than at a later point of time, and paying later, is most rewarding. This should be especially true for more impatient or impulsive people with less self-control.

If people consider the benefits of immediately possessing a commodity or using a service, then according to Prospect Theory (Kahneman & Tversky, 1979) the psychological value should be high. However, also costs of the price should loom large. Assume that the objective value of a product equalling R at t_1 makes a person well off. At the same time, an objectively equal price would lead to a high psychological cost C at t_1, so that costs may exceed rewards ($R_{t1} < C_{t1}$). People may then abstain from purchasing the product. However, if rewards are immediate (R_{t1}) and the price is payable at a later point of time (C_{tn}), then as demonstrated by

Mowen and Mowen (1991), according to quasi-hyperbolic discounting the future costs are discounted and the difference between R_{t1} and C_{tn} is likely to be positive ($R_{t1} > C_{tn}$) (see Figure 5), so that people would decide to buy. Finally, if they have the opportunity to take a loan that is repaid by small amounts in the future, then the costs would appear even lower. The costs, C_{t2}, C_{t3}, C_{t4}, etc., are not only distant as future costs, but may also appear small as rates represent rather low amounts ($R_{t1} > \text{Sum}(C_{t2}, C_{t3}, C_{t4},\ldots)$). The aggregated psychological value of all costs of installment rates may appear even smaller than the total costs payable at once at a future point in time. In several economic theories it is proposed that present orientation and a high discounting factor drive borrowing in general (Fehr, 2002; Laibson, 1997).

Experimental studies show evidence that small credits provoke higher discount rates than large credits, immediate installment payments induce higher discount rates than distant payments, and delays in payment time lead to a decline in discount rates (Estelami, 2001). Subjective discount rates also differ if credit conditions are framed differently. 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 if 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, while in case of odd endings, discount rates for disaggregate amounts appear much smaller than for aggregate amounts (Estelami, 2001). Also, the amount of information and complexity of information matters. 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 presenting credit offers influences whether the costs are anticipated correctly or not, and so do the different layouts of credit offers in form of pictures, photos, and tables (Bertrand, Karlan, Mullainathan, Shafir, & Zinman, 2005).

Risk-Defusing Operators

Borrowing bears the risk of not being able to repay installments and to become over-indebted. If people realize that the attractive alternative, such as taking credit, may produce a negative outcome, they may seek means to reduce or avoid the risk of the negative outcome already at the time of 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 wanting to buy an apartment or a car on credit, but not being certain whether they can meet the monthly installments, may take out a consumer credit repayment insurance.

Risk-defusing operators are quite common in everyday risky decision making. A risk-defusing operator provides the decision maker with at least some control over the risk and controllable risks are experienced as less serious than uncontrollable risks (e.g., Vlek & Stallen, 1981; Weinstein, 1984). Ranyard, Hinkley, and Williamson (2001) and McHugh and Ranyard (2009) examined risk management strategies (in particular payback protection insurance) used by people with different 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 credit risk 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 credit risk insurance was made, which was particularly the case if a person had made unsuccessful claims or had already experienced payment difficulties in the past, information search focused on the key attributes costs and conditions.

Coupling vs. Decoupling

Decisions to buy on credit involve costs and benefits. Depending on mental associations between the costs of the credit and the rewards of consuming the credit-financed product, that is what may be called integration or segregation of costs and benefits, loan burden is experienced differently by different borrowers (Kamleitner & Kirchler, 2006). Borrowers may mentally associate the costs and benefits or segregate them. Prospective double-entry mental accounting proposed by Prelec and Loewenstein (1998) is relevant to such experiences at credit take up and during payback periods. The term refers to interactions of present and future pain of payments with present and future consumption pleasure. These interactions are termed coupling and decoupling, respectively, defined as the degree to which thoughts of payment arouse thoughts of consumption or vice versa. Double-entry mental accounting assumes a reciprocal interaction between the pleasure derived from consumption and the pain associated with paying. As long as a good is not fully paid off, pleasure of consumption would be attenuated by painful thoughts about the remaining payments. This is supposed to hold as long as payment and consumption are mentally coupled, that is buying and paying are perceived to be fused such that one is perceived as the other side of the same coin. If consumption and paying are strongly associated, the pleasure of consumption would be reduced.

The sale successes of credit cards are frequently attributed to decoupling consumption from payment. While consumption is immediate, payment is temporally segregated from consumption. Moreover, credit card bills usually contain several items bought in the past and people often regard the total amount to be paid rather than the costs of single items, such that attribution of the costs from the overall bill to single items is often not made (Gourville & Soman, 1998). Double-entry mental accounting implies that loan payments become progressively less burdensome because the outstanding debt balance and the associated pain are frequently shrinking more quickly than the utility derived from consumption. In addition, it predicts that credit financing is mostly accepted for long-lasting goods that do either not or only slowly depreciate in utility, 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 rate which is paid back would then be perceived as an action leading to reducing the debt which is perceived as a gain. Moreover, credit users frequently believe that monthly payments are all that matters (Emmons, 2004) and 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 costs-to-benefit associations buffer the pain of payment, benefit-to-cost associations attenuate consumption pleasure. Although double-entry mental accounting 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. In addition, coupling can be assumed to be stronger for needed products whose purchase is more easily justified than for products with hedonic value (Kamleitner & Kirchler, 2006), and if such hedonic products are associated with their costs, besides the burden of paying back the credit, feelings of guilt and regret for having bought them may arise.

Repayment Experience

Anticipation before taking a loan, experiences during paying it back, and recall may differ. As Hoelzl, Pollai, and Kamleitner (2009) found in a survey of homeowners, credit users expected lower levels of emotional loan burden in the future and reported higher levels in the past. In the survey three groups living in their homes for 5 years, from for 5 to 10 years, and from for 10 to 15 years were asked about the current burden of their loan, the predicted, and recalled burden. In the view of credit users, the loan burden should decrease over the payback period. However, this was not the case. The burden remained similar over the period with no systematic change over time. As Figure 6 shows, both predictions and recall were different from actual experiences. 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 evoke thoughts of the loan, the higher the experienced loan burden. Also, the strength of association 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, and they may not correctly anticipate a decrease in the experienced pleasure due to habituation (Frederick, & Loewenstein, 1999). As pleasure decreases over time, people may experience increasing strains as the payments continue. In order to deal with this hedonically unsatisfactory state, in a consumption-oriented society people are tempted to borrow again for further purchases, and consequently they may slide into problem debt. Indeed, most credit users and non-users agree that credit encourages people to buy things not really needed (Berthoud & Kempson, 1992).

There is empirical evidence for a gap between anticipation of experienced benefit of the purchased product as well as the burden of installments over time. On the one hand, it can be hypothesized that subjective experiences of credit use may develop similarly to a pattern of "good things satiate and bad things escalate" (Coombs & Avrunin, 1977, p. 224). Over time, people may get used to a new product financed by the credit and its value diminishes, the pain from the credit payments may escalate and the monthly bills start to become increasingly annoying. Benefit depreciation (Gourville & Soman, 1998) is critical when the pleasure with the purchased product disappears, while there are still installments to pay. Pain of payments cannot be buffered anymore by the pleasure that in the past was derived from the product. At this point in time people are likely to desire to buy additional products, and in case they lack the required money, they may take more loans, and thus run an increased risk of indebtedness. On the other hand, it is also possible that borrowers first experience difficulties with the new financial situation but accommodate to it quickly resulting in less perceived pain as time goes by (Prelec & Loewenstein, 1998). Loan payments could become progressively less burdensome because the outstanding debt balance and the associated pain are shrinking more quickly than the consumption benefits.

Reconstruction

Most studies show that credit users are facing a complex task when deciding to take up credit and often fall prey to faults when anticipating their experiences with credit payback. In retrospect, the subjective pain of paying back credit may be less pronounced than the costs experienced during the payback period. In retrospect, people may also be tempted to repeat their original judgments and predictions, select experiences differently and weight peaks and

the end experiences rather than the whole repayment process (Kahneman, 1994). In hindsight the reconstruction of one's experiences 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. This would suggest that borrowing money is risky and often leads to indebtedness. 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 (Bridges & Disney, 2004). Frequent reasons for late payment are taking up too much credit, unforeseen life events (e.g. health problems), and in few cases, forgetting about the payment (Canner & Luckett, 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 & Luckett, 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 after 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 high but are heavily discounted when they occur in the future. Studies of processes after credit take up focuses 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.

HOUSEHOLD CONSEQUENCES OF FINANCIAL CRISES

Individuals and households are in several ways affected by financial crises and economic recessions. 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 or more expensive available personal loans and mortgages. For some people, wealth decreases due to losses on the stock market. Busts on the stock market may also have consequences for pension incomes if partially or fully based on stock returns.

Consumer Confidence

The *Index of Consumer Sentiment* developed in the US 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 negative about the (inter)national economy than about their own financial situation (Van Raaij & Gianotten, 1990). Mass media reporting on economic affairs are especially important, because for most people the mass media are the main source of information about economic developments. News in the mass media may be political news or 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, save more, and are 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 affects 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, unfavourable economic developments is more difficult than adapting to favourable 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 having fewer vacation trips. 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 in high quality and durability that will pay off later. Other households, mainly the low-income households, are forced to buy cheaper low-quality products. In the longer term, these products may wear out sooner than high-quality products and are thus actually more expensive than high-quality products. The fourth tactic is *lifestyle change*. This is the most difficult for most people. For this reason this tactic 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 supress an annual vacation trip. This last curtailing tactic 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.

From an economic perspective, the most effective way to cope with adverse financial developments would be to sell the house, the car, the boat, or other durable goods. However, people are attached to these goods that are part of their lifestyle. Selling these goods will thus be a last resort for them.

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 stay. If perceiving favourable indications, for instance a new job opportunity, this is a sensible strategy. The following differences between people were also observed (Van Raaij & Eilander, 1983). Younger people are usually more flexible than older people. Older people, who have experienced economic recessions before, are however better able to cope with the changed circumstances than younger people without such an experience. 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. 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.

Counter Measures

Curtailing expenses may be possible with improved budgeting and "mental accounting" (Thaler, 1999) techniques taught. 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. Monthly periods may be used if it corresponds to receiving monthly wage payments. 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 to 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 even 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 websites to assist clients in achieving better insights and control of their spending.

Implementation of counter measures is however not an easy task. 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, where people increasingly become responsible for themselves and can rely less on governments 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 has been demonstrated including buying cheaper, buying less, buying higher quality (more enduring products), and buying fewer (or selling) durables. Since the latter implies life-style changes it is a last resort even though it would be the most effective way of coping. Even more needed today is education in financial management and increased knowledge of financial products, 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 US examples include Northern Rock and IceSave), and risky takeovers (other current examples are Fortis, Bank of Scotland, and Banco Santander taking over ABN Amro Bank) has 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 considered as the experience of certainty where formally no certainty can exist.

How does trust in a financial institution originate, and if trust is gone, how can it be regained? Pirson and Malhotra (2008) have distinguished five determinants of trust. The following four apply to financial-services providers as well as an additional three that should be relevant for financial-services providers in their relationships with business and private customers.

1. *Competence* is knowledge of financial products and the competence to communicate this knowledge to customers. Knowledge of customer financial knowledge and 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, the evaluation of their competence will be lowered by customers.
2. *Stability* is the continuity and solvability 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, and 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 the 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 formal.
4. *Benevolence* comprises giving advice and communicating from the client's perspective and the client's interest, and 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 not only sell their own products but also other providers' products if that is better for the customer, this reinforces the perecption that customers and their needs are central. A pro-active 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 products, and offering less complex and therefore understandable products. Transparency also pertains to

clear information about liability, rules, procedures, and the consequences of economic changes (interest rate, house prices, and recession). 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 to have a preventive effect: More openness should lead to lower bonuses and provisions. If customers know exactly how much a transaction intermediary earns, this may lead to a stronger negotiation power but a lower trust.

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 labour, or unsustainable products. These banks attract clients with 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 the performance and communication in the past. "Branding" defined as the positioning and formation of favourable associations by advertising play a role in the building of reputation. Reputation is also built by personal experiences of clients and "word-of-mouth" of other clients. Reputation may be related to a partial aspect such as 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 pre-conditions or as Herzberg, Mausner, and Snyderman (1959) (see Oliver, 1997) call it, "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 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." 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 criterion may also become a differentiating factor. Above a certain level, competence may then change from a "dissatisfier" to a "satisfier."

In the aftermath of financial crises with reduced trust in financial institutions, both the institutions themselves and governments need to regain trust. The determinants of trust listed here are factors that should be considered. A longer-term goal is to promote research with the aim of consolidating the empirical base for assessing the relative importance of the identified determinants.

A SOCIAL PSYCHOLOGICAL PERSPECTIVE ON ECONOMIC CRISES

Asset bubbles, which inflate at first slowly, then rapidly, suddenly bursting, have a long history: The Tulip frenzy in 17th century Holland; the South Seas bubble of the 18th century; the stock market boom and bust of the 1920's; 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) also speculates about the human element involved. Unlike the detailed experimental results reviewed in this article, authors including economists Galbraith and Keynes, although not psychologists themselves of course, seem 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, where 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). There is also a certain "madness of crowds" and self-fulfilling prophecies which encourage people to do things that they would not otherwise do on their own. 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. There has been no general and coherent questioning of the nature of capitalism even when things go disastrously wrong. The next bubble and bust, when it comes, is inevitable.

The proximal causes of the contemporary credit crunch are of course contested. However, there is a degree of consensus (e.g., Akerlof & Shiller, 2008; Krugman, 2009). In summary 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 debt on to finance companies which 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 where 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 IMF to help struggling economies and agreed restrictions on bankers' pay and bonuses. This followed actions in the UK 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 after the event. 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" where loans are sold on to other financial institutions was not seen as especially risky but, instead, a financial innovation where everyone benefits. It was 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, leading to 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 trust financial institutions (and perhaps the capitalist system itself) in the same way and are 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 were not): As long ago as 2001 in a national survey of the UK, 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 aspects matter but are rather vague about them, recalling the Keynesian notion of "animal spirits." One of these psychological truisms is that we are susceptible to bubbles whether they are housing price bubbles or an irrational exuberance for tulips. Shiller (2008) seems to take the view that while bubbles can arise from 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. In recent times property prices in the US have risen 14 years in a row. House prices are not easily explained by interest rate changes, building costs and population growth; they seem to have a life of their own. These false expectations are shared by experts and commentators alike in a set of "new era" self-fulfilling stories; a kind of "social contagion." It is indeed rational to follow a bubble providing one understands that this is what it is and not a

reflection of fundamentals. If its psychological nature is as powerful as it seems it may also require that a "winner" must find 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, who, by consuming, increase the MPC of others, and so on. The reverse is true in a recession where confidence is lost. There is a multiplier for confidence and lack of confidence, or even for corruption and poor business practices, including sub-prime lending, which is legitimised by the fact that "everybody else is doing it." This is reminiscent of social contagion as well as of "groupthink" (Janis,1982), where collective wisdom is so powerful that new contradicting evidence is ignored.

What Kind of Psychology?

Akerlof and Shiller (2009) represent a growing number of economists who recognise that a psychological perspective is necessary in economic analysis. What makes them unusual is that they have borrowed ideas from social psychology and sociology. As noted in the preceding sections, most inroads have been made by cognitive psychology. This was recently critized by Etzioni (2009) who argued for a sociological perspective. It could be that cognitive psychology has most relevance to micro-economics and social psychology or sociology most relevance to macro-economics?

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 which is sanctioned in the culture in which they live at a particular time. Unlike psychology in general, less emphasis is placed on the human evolutionary history and to the idea that people are still locked into behavior patterns more appropriate for stone-age man. Instead, critical social psychology 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. We are not necessarily talking about different types of people as critical social psychology favours 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. Down the left hand side are values, characteristics, and economic and political factors which may be seen as indicative of a civilised society. Down the right is a mixture of factors which may also be required for a civilised society but are heavily dosed with realism rather than idealism. The first row is a snapshot of two political-economic systems: one where the government intervenes in order to redress market failures and a second where the interference of government is kept to a minimum as the markets do their good work. The argument here is that government policy influences which aspects of multiple selves can be most freely displayed. In the UK in the 1980s, Margaret Thatcher claimed that reducing the tax burden and provisions for social welfare put money in the pockets of individuals which encouraged individual benevolence and charitable giving – a "crowding in" of private charity to replace public sector coercion. The opposite argument, the "demonstration effect," claims that a benevolent government with caring health and welfare programmes encourages benevolence among citizens. The case for either side is far from clear-cut (Jones, Cullis, & Lewis, 1998). What is opined here is that although governments in a democracy should reflect the preferences of voters, especially at election times, a government through its ensuing policies shapes organizational cultures as well as attitudes and values of citizens through its term of office. Depending on ones

preferences, the policies of Margaret Thatcher and Ronald Reagan either empowered individual responsibility or legitimised self-interested behavior.

At a slightly lower level, the organisations people work for shape their behavior as well. How are people rewarded at work and what do they have to do to gain a promotion? In careers like teaching and nursing, promotion comes with experience and rewarding 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 socialisation process at work, organisational culture reinforces some aspects of the multiple self rather than others.

All these dichotomies are contested and are in flux and none perhaps more so than femininity and masculinity. 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 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 less likely to behave in a narrowly self-interested and instrumental manner (Gilligan, 1982; Lewis, Carrera, Cullis, & Jones, 2009). Similar divisions are reflected in the values of altruism and egoism.

Materialism is related to continual need to consume more and where material goals become essential aspects of people´s self identify (Belk, 2008; Dittmar, 1992; Kasser, 2003). This is also linked to the partly false assumption that more consumption and more wealth lead to greater happiness (Diener & Seligman, 2004) – a belief system which is linked to a pursuit of wealth rather than of well-being. This is a powerful belief system exemplified by highly successful lottery schemes in many countries. However, the research shows that people who score highly on materialist measures are often unhappy and 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 are made between open and closed mindedness and conventional and less conventional thinking.

This is a balancing act in two columns as neither column, 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 favours less government, it is the government in the left column which 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? The rest of this section pays particular attention to the organizational structure of institutional investment and the role of champions as a mirror of a broader problem. Making the relevant cultural shifts required 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 more likely to be listened to.

Like several other commentators, Guyatt (2009) identifies the credit crisis as multi-causal. She cites the irresponsible mortgage lending of retail banks, the failure of credit rating agencies, 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?”). She also includes institutional investors and advisors in the mix, like those responsible for pension funds, and questions why these financially powerful groups failed to

challenge conventional thinking or question 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 the organisational culture must be re-focused. Three main problems are identified: *Lack of social responsibility*, *short-termism*, and *conventional thinking*.

When considering social responsibility it will be recalled that the economist Friedman had little sympathy: "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). 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 where long-term environmental, social, and corporate governance (ESG) considerations are included within investment processes in order to achieve both financial and social outcomes (Eurosif, 2006).

While socially responsible and sustainable investments (SRI and SI) are long-term investments, case studies by Guyatt (2008) reveal that most fund managers have short-term horizons, even in institutions which claim to be committed to long-term responsible goals. The main reason given for this from among her interviewees 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 there is a fear that longer-term investments which are not successful would have dire consequences for their reputations, their salaries and bonuses – even their jobs. In comparison the collective memory of short-term failure over three or six months can be wiped out by success over the next three to six 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 behaviour leads to market volatility, bubbles, and crashes. The idea of SRI and SI is that it is 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 behaviour 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 towards relative returns compared to an asset-based index or benchmark, and; reviewing fund manager performance over short periods, typically quarterly.

Possible Remedies of the Problems

Juravle and Lewis (2008) have identified a number of impediments to changing institutional investment practices which mirror the kinds of problems to be faced generally when attempting to modify organisational cultures in the finance sector. These include individual, organisational, and institutional impediments. While behavioral impediments like cognitive biases are familiar to research (as referred to in preceding sections), organisational and institutional impediments have not been explored to the same extent. Organisational impediments include: remuneration systems for analysts and fund managers based almost entirely on short-term performance; inequitable remuneration packages where SI experts are paid less than mainstream financial agents, and; management systems and cultures where 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 SRI intangibles. From this perspective challenging short-termism requires addressing the problem at individual, organisational 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" (key actors in the UK asset management houses championing SRI policies) 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, materialism, and unsustainability. SRI teams are often frowned upon if they succeed. Interviewees said they were disliked if they succeeded and were stereotyped by the establishment. Many SRI champions believe that financial markets, because of their short-termism and incentives for quick profits, fuel unsustainability.
2. *Institutional facilitators.* In the UK a change was made to the Pensions Act in 1999 where pension funds were newly required to report whether they took into account social, ethical, and environmental issues. This change provided the impetus required for SRI teams to be formed. In addition corporate scandals in the UK and the US 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 naïve to believe the financial sector will put its own house in order unaided.
3. *Organisational impediments and facilitators.* SRI teams are often marginalised where there is a structural segregation between SRI teams and conventional teams. Senior management may pay lip service to SRI teams but remain highly sceptical. SI only becomes part of the core business where senior managers value sustainability beyond its potential financial gains. There appear to be three main organisational 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. With this kind of organisation SRI is a long way from the core 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 organisation is very rare. Here SRI people are fully integrated in the decision-making process. In this third structure the asset house has also addressed short-termism by incentivising three-year rolling performance for everyone in the group. This is in marked contrast to most other asset houses involving an element of SRI where SRI teams are paid less than conventional managers, and where conventional managers are incentivised on a quarterly basis. There was an understanding in this third organisation 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 language of the "city" and sharing the narratives. There is a battle over language as SRI criteria can be seen as immaterial rather than material, part of a package of extra-financial factors rather than financial factors. Materiality is a powerful buzzword and SRI activists realise they have to convince others that these 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_2 omissions. SRI champions also gain respectability through professional networks and 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 conventional market actors, so in order to be convincing they need not only to learn the language but also to gain relevant

expertise. SRI investment enthusiasts are often driven by their own moral concerns but these tend to be down-played in the effort to make the business case. In fully integrated teams this must be matched by more expertise among conventional analysts about SRI concerns.

Summary

We argue that bringing about change in financial institutions is no easy matter. It is suggested 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 is being questioned. Public opinion, government intervention, and the reactions of financial organisations themselves will all play key roles, yet cultural conventions are deeply embedded. Key actors need to be incentivised to devise longer-term financial plans helping to build "an inclusive, green and sustainable recovery" as stated in the G20 summit. Education programmes which underline moral aspects of financial decisions need to be central in university education and in training in the workplace.

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 how can individual behavior cause such phenomena? Different meta-theoretical stances concerning the relationship between explanations of macro-level phenomena at an individual level have been voiced (Tetlock, 1998). It is beyond our scope to discuss this controversial issue in greater detail. In this article we suggest that common individual cognitive biases, affective influences, and social influences play some role for market anomalies. We do not deny that cultural and institutional factors also play a role. In drawing on what is referred to as behavioral macro-economics, Akerlof and Shiller (2008) make several bold propositions about the role of individual behavior for the current financial crisis. We want to exert greater caution in (i) inferring behavioral causes of market anomalies, and even more caution in (ii) inferring that market anomalies are causes of financial crises. In the preceding sections we have expressed a view which may be contrasted to other (more comprehensive) views, such as those by the economists Akerlof and Shiller (2008), Gailbraith (1955/1997), and Krugman (2009).

It is difficult to overestimate the importance for the development of efficient markets that money once was introduced as a means of payment, successively replacing barter economies (Lewis & Mizen, 2000). At the same time, financial markets where money is the single or dominant commodity appears not to work properly. In this article 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 (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 re-payment of loans and benefits of credit-financed products. If common boundedly rational or irrational behavior by many people (in contrast to idiosyncratic) results from how markets function and to some extent causes market anomalies and financial crises, then changing 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 lead to that people learn 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 educate them in financial management may go some way to the goal (Leiser et al., 1990; Lea et al., 1995; 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 the free markets themselves create. However, we suggest that markets do not themselves correct biases and neither does incentivizing rational behavior. It is nevertheless a controversial issue whether markets should be re-regulated to take this into account. Do improved information to consumers and decision aids make deregulated financial markets work better? In general, deregulations of markets in conjunction with more technological advanced production have led to an increase, sometimes a tremendous increase, in alternatives offered to consumers, for many a higher number than desired (Schwartz, 2004). A horror example is the new Swedish pension scheme requiring citizens to choose five equities among 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 may be to aid citizens' decisions by presenting 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 et al., 2005; Fox et al., in press). Additional research and ideas are needed here.

Similar problems are abundant in credit markets where 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 a credit take out a credit repayment insurance. Such payback protection methods were examined by Ranyard et al. (2001) and McHugh and Ranyard (2009). Interestingly, they observed a spill-over effect to improved risk management by credit users.

We have illuminated some of the consequences for people that financial crises and economic recessions seem to have. 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 the possibilities of curtailment by systematically taking account of their spending. 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 desirable developments and an expression of increased responsibility on the part of financial institutions. Currently financial institutions should seriously consider such and other means to regain society's and customers' trust.

In this article 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 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 to decrease.

An even broader overarching issue is how to strike a balance between an economic-political system where the government intervenes in order to redress market failures and another where the interference of government is kept to a minimum as the markets do their good work. We also 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.

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FOOTNOTES

[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 not 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 that stock shares change 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 composition 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* refer 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* such, as for instance, pension funds or insurance companies.

[4]A basic tenet of efficient market theory is that in the absence of "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 the present value of their future cash flows. 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 tend to appear at random, it follows that the prices change randomly (referred to as a "random walk"). The theory implies that future stock returns are entirely unpredictable from past stock prices (the random-walk hypothesis) or any public information. Not even inside information is useful for prediction since it will quickly leak out.

[5]DeBondt (2008) identifies several other market anomalies. We focus here on a subset where it appears reasonably clear that psychological principles of judgment and decision making play a role. It is also clear that *overreaction to news*, *disposition effect, and reactions to share splits* qualify as anomalies since 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 aversive to risk or loss (the salience of the downside) 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 of 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." In *Saturday Evening Post* the journalist Edwin Lefèvre published interviews with an investor in Wall Street called Lawrence (Larry) Livingstone believed to be a pseudonym for Jesse Livermore. These interviews appearing in a book (Lefèvre, 2005, is a new edition) contain many 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 Sörös (Soros, 1987) claims to have made his fortune not by betting on fundamental values (arbitrage) but on anticipated herding.

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Table 1
Fund Returns in Investment Experiment
(After Hedesström, T. M., Svedsäter, H., & Gärling, T. (2006). Covariation neglect among novice investors. *Journal of Experimental Psychology: Applied, 12,* 155-165.)

	Negatively correlated returns			Positively correlated returns		
	Fund A	Fund B	A+B	Fund A	Fund B	A+B
Scenario 1	15000	9000	12000	19000	17000	18000
Scenario 2	13000	10000	11500	15000	14000	14500
Scenario 3	11000	11000	11000	11000	11000	11000
Scenario 4	9000	12000	10500	7000	8000	7500
Scenario 5	7000	13000	10000	3000	5000	4000

Note. The scenarios display how much (in Swedish Crowns or SEK) an investment of SEK 10,000 has increased or decreased in 10 years time.

Table 2
A Good Society

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

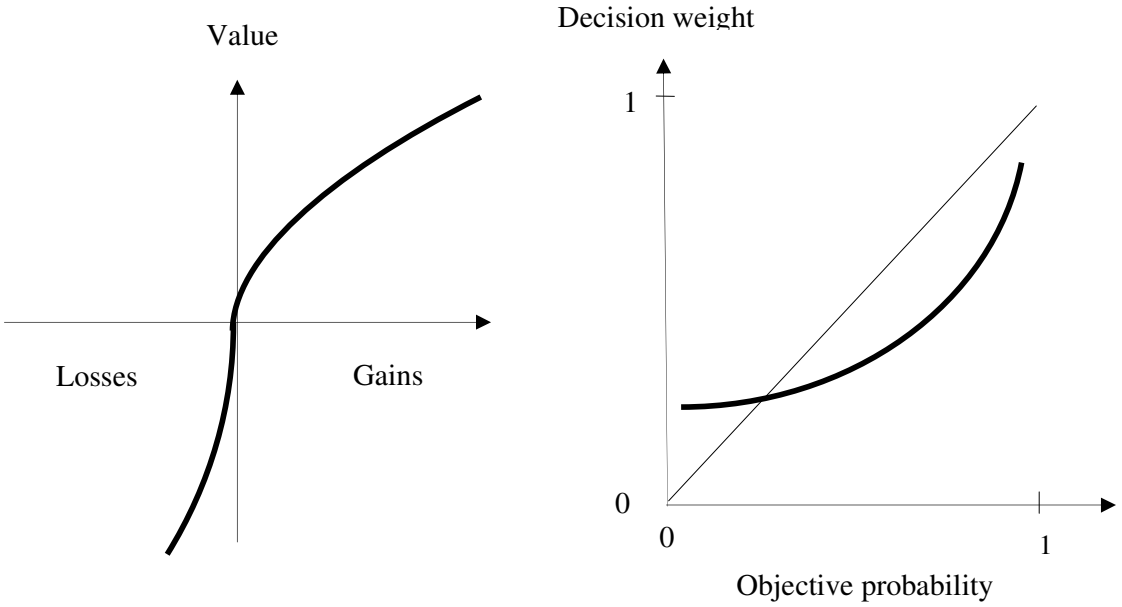

Figure 1. Prospect Theory's value and decision-weight functions.

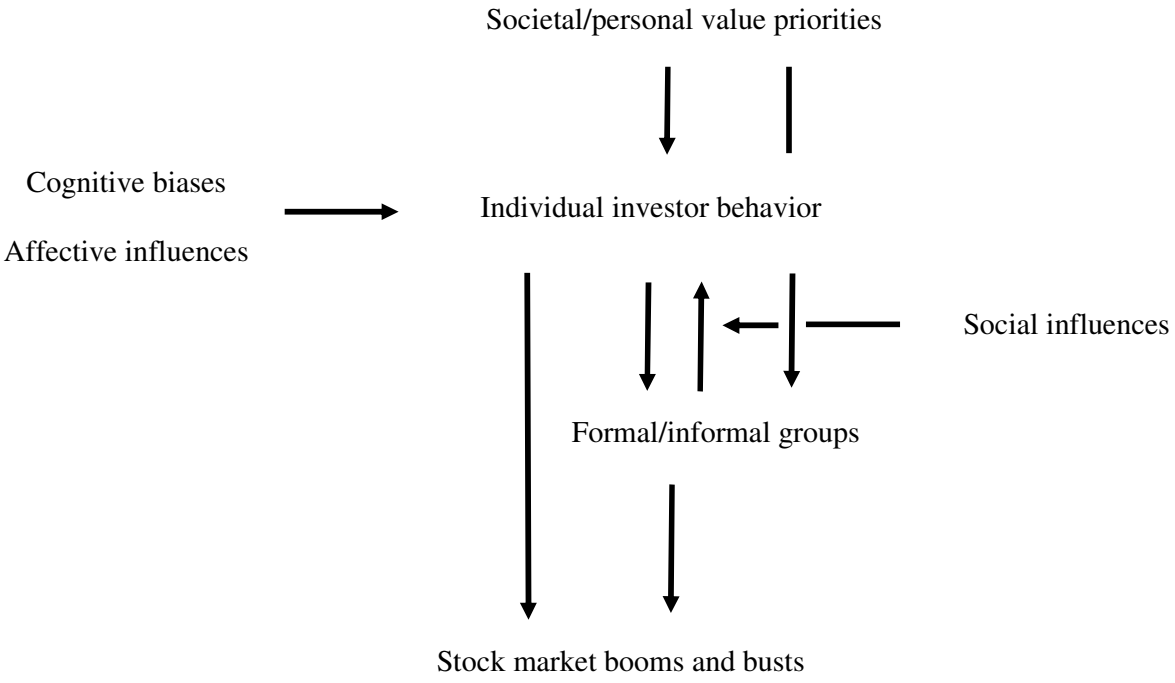

Figure 2. The joint influences on stock market booms and busts of societal/personal value priorities, cognitive biases, affective factors, and social factors.

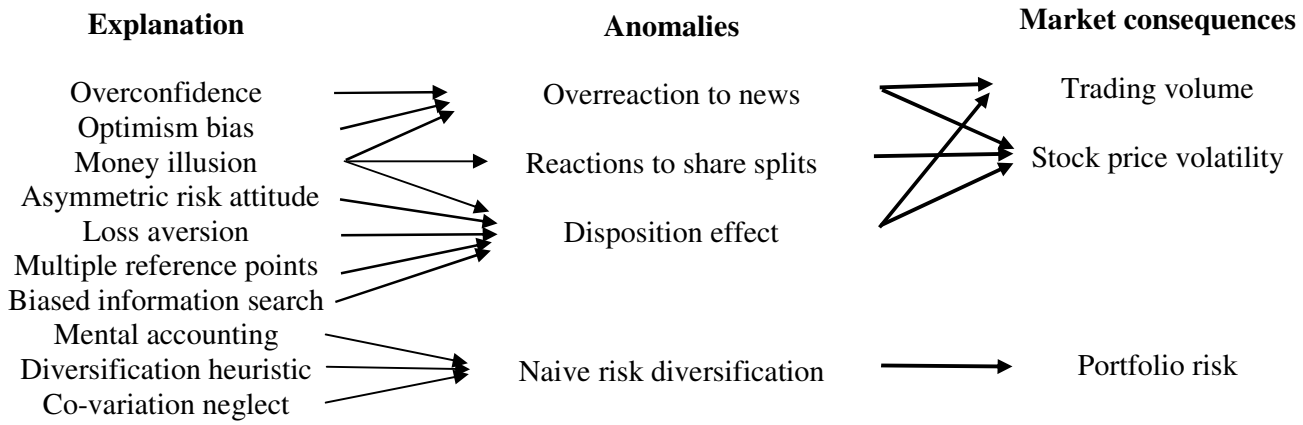

Figure 3. Cognitive biases that are supposed to explain anomalies in stock markets and their market consequences

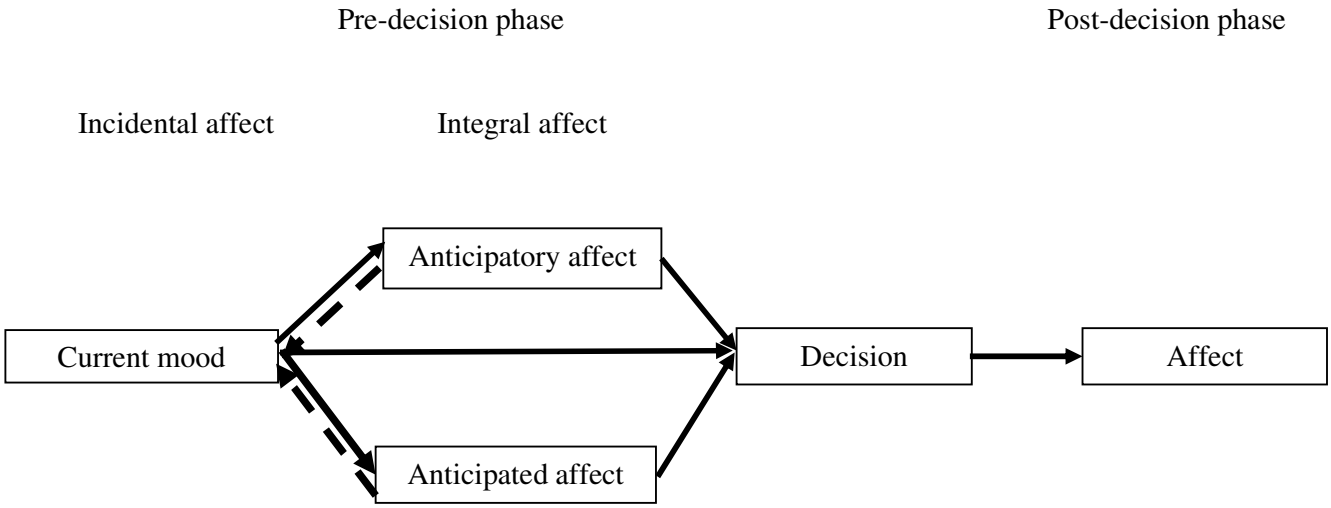

Figure 4. Different forms of affective influences on decisions in stock markets.

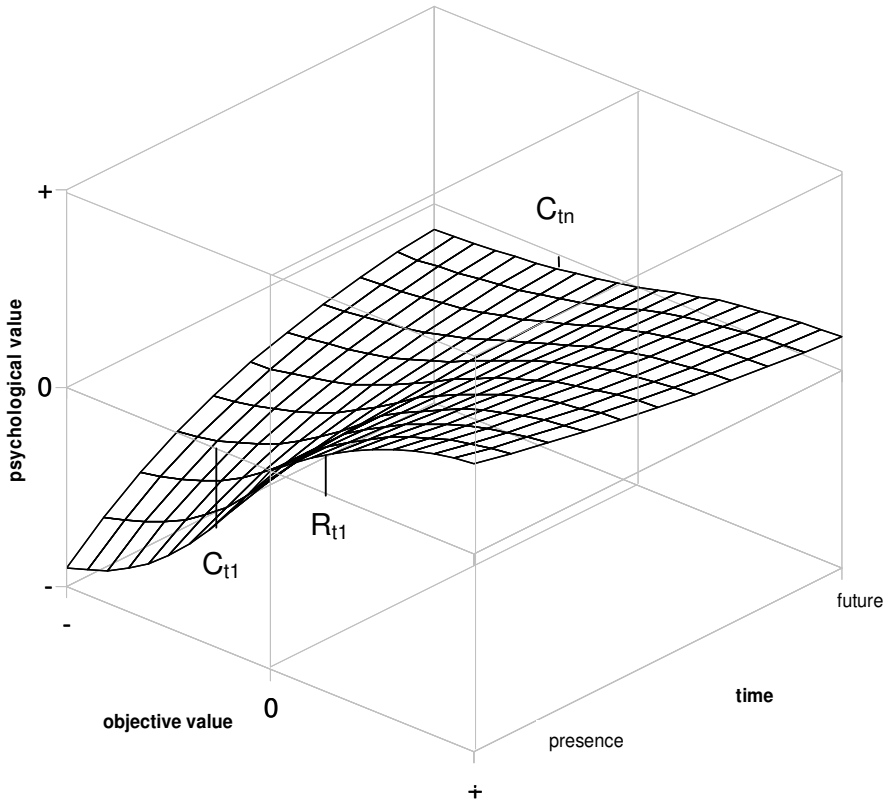

Figure 5. Objective and psychological value of rewards of buying and costs of paying at different points in time (see text for explanation).

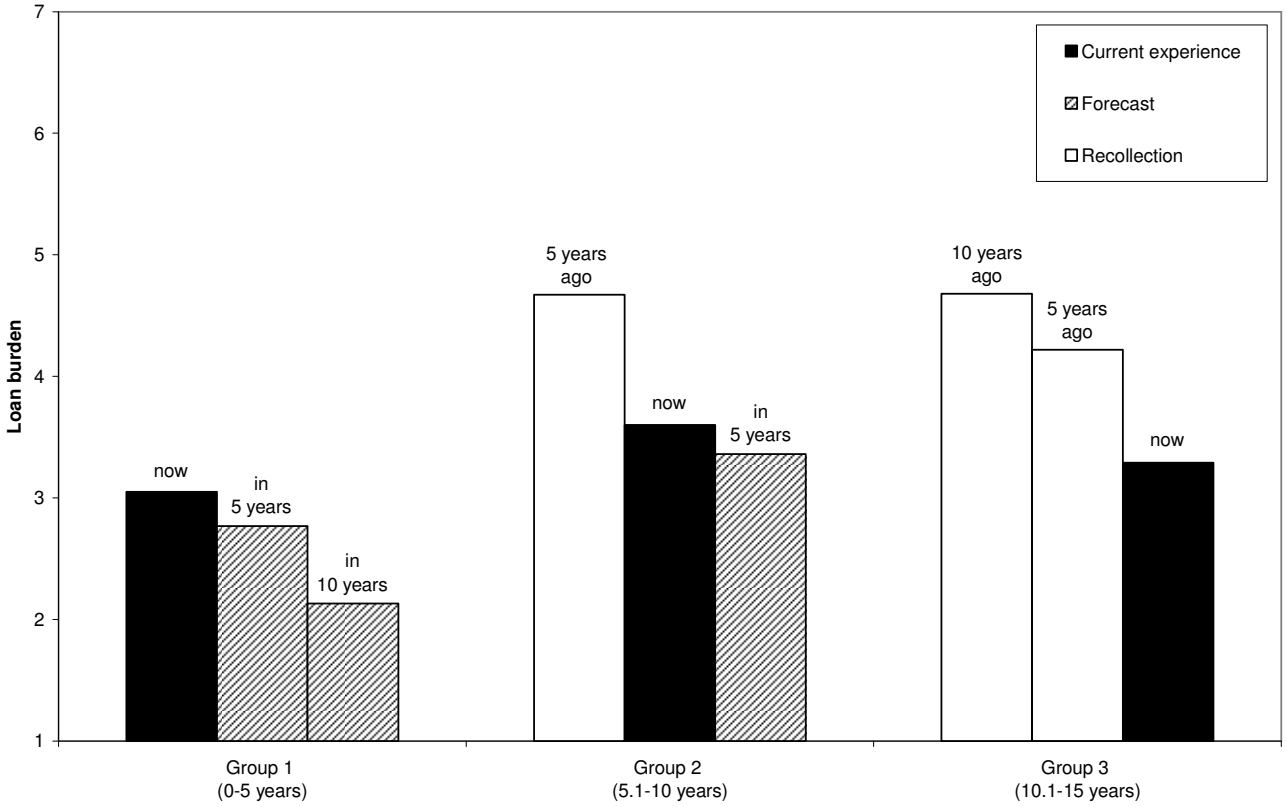

Figure 6. Loan burden by homeowners living in their home up to 5 years, 5.1 to 10 years and 10.1 to 15 years currently experienced, forecasted and recollected (adapted from Hoelzl, et al., 2009, Table 1)