

Introduction

In September 2008, with the collapse of Lehman Brothers, the world witnessed the beginning of one of the most severe economic crises in human history. However, this crisis was only the culmination of problems that had originated several years before. Following the rapid expansion in the home mortgage industry in the mid-1990s, many homebuyers were unable to meet their monthly payments as interest rates rose (Case & Schiller, 2003). There were large-scale defaults by debtors throughout the United States. When several large banks destabilized, they called on the U.S. government to bail them out. Some banks were rescued, others not. This situation created an unstable market, and soon trust in banks declined.

About 20 years earlier, a similar crisis occurred in Sweden that had major consequences for several years. The lack of valid credit assessments was one of the most important causes of the crisis according to the Swedish bank manager Jan Wallander (1994, p. 143) who writes: "*...the losses can be explained by poor credit assessment and lending by banks, neglect and an unreasonable risk.*" Poor credit assessments also had severe consequences for the Swedish banking industry in the economic crisis of 2008 since four of Sweden's largest banks had difficulties in determining the soundness of their clients (Hallvarsson & Halvarsson, 2010). In addition, the causes of the crisis in Sweden have been suggested as mainly macroeconomic – namely, high growth, high inflation and deregulation of the credit market. However, poor risk management by banks (e.g., a focus on market share rather than on earnings) has also been suggested as an influential factor (Lybeck, 1994). In order to avoid economic crises in the future, Green (1995), for example, emphasized the importance of learning more about processes that precede credit decisions. van der Sar (2004) concluded that the psychological aspects of human behaviour in financial crises have great importance.

In recent decades, the academic field of psychology has shown an interest in economic decision making. One of the most influential ideas is prospect theory, developed by Kahneman and Tversky (1979), which led to their award of the Nobel Prize in Economic Sciences in 2002. This theory marked a turning point in how human decision makers are viewed in terms of rational behaviour. Previously, human decision makers were viewed as rational decision makers who followed the normative expected utility theory (Von Neumann & Morgenstern, 1944/2006). Kahneman and Tversky (1979) showed that decision makers deviate from this theory in several ways. A rational decision maker should only take into account the utility and the probability of outcomes; all other information should be neglected. In a lending situation, this could be the potential revenue that a bank will receive from a client (utility) and the probability that the bank will actually collect this revenue (probability). In other words, what is the probability of default?

However, prospect theory postulates that utility and probability are treated differently, depending on the situation. One central finding is that decision makers are loss averse. Prospect theory is a fundamental part of the heuristics and bias paradigm, which has shown that decision makers take cognitive shortcuts that, in some situations, lead to biased decision making (Gilovich, Griffin, & Kahneman, 2000).

Another research strand relevant for economic decision making research is naturalistic decision making (Klein, 1998). Research in this paradigm has focused on how experts make decisions in real life settings. Much of this research focuses on how experts use decision making strategies that work outside awareness. It has been found that experts remember earlier patterns from decision situations and match these patterns in similar situations (Klein, 1998). Research shows that pattern-matching occurs rapidly, outside awareness. It is argued that a rational approach such as an analytic assessment of a similar situation, where a decision must be made quickly, would be too time consuming and place too high a load on cognitive resources.

Together these two strands of human decision making research can help explain lending decision making.

The aim of the thesis

The overall aim of the four studies in this thesis is to gain a better understanding of lending decision making in banks. The studies in this thesis reflect a progressive development in both theoretical underpinnings and research method selection. The first study reviews the literature on lending decision making. The second study consists of explorative interviews with bank loan officers. The third and fourth studies, which are theoretically-based, test hypotheses on lending decision making using surveys, interviews and experiments. The reason for beginning with a literature review and an explorative study was to learn about the context of lending decision making before proposing hypotheses. It was critically important to understand the context of lending decision making in advance of testing these hypotheses.

The four studies should be viewed as a totality. Study I reviews the literature on lending decision making published in the last ten years. Study II relies on this review to investigate the difficulties loan officers experience when making lending decisions using the Critical Incident Method. In Study III, findings from Study II (the importance of information processing and lending technology for lending decision making) are tested in a survey study. Based on findings in Study II, the exposure to the sunk-cost effect and its relationship to cognitive information processing are investigated taking an experimental approach in Study IV.

The rest of this summary is structured as follows: First, I briefly introduce the role of the bank loan officer in lending decision making. Second, I review the theoretical background relevant for the four studies. Third, I summarize the four studies. Last, I discuss the findings from the thesis

including implications for banks. I also describe the limitations of the thesis and suggest topics for future studies.

The role of the bank loan officer

The bank loan officer's role in credit assessments has changed considerably in the last 50 years. This role has evolved from the community-based local banker with family-like knowledge of his or her clients, to the technocratic banker of the 1960s, to the client-oriented banker of the 1980s. Today's bankers largely assume the third role, but as banks have grown larger, with an increasing number of clients from society's expanding middle class, loan officers have found it nearly impossible to maintain personal contact with their clients. What were once local and regional banks are now national and international institutions (Lynch, 1996).

Because of this development in the role of the loan officer and in the nature of banking, the possibility for banks to make personal evaluations of their clients has decreased. As a result, a demand for more rules and regulations related to bank clients has arisen. In general, this situation has led to greater centralization in banking such that local bank branches require approval from their head offices for their lending decisions. Increased computerization, which has enabled faster decision making in accordance with bank policies (Rosenberg & Gleit, 1994; Wallander, 2002), has changed bank-client relationships. Today, lending decisions to a great extent are based strictly on financial data and other quantitative information. However, banks with fewer clients and a clear lending market policy still deal with their clients by establishing personal relationships.

Transactional lending technologies based on standardized evaluation of financial information and other quantitative data have become fundamental tools in the assessment of loans (Altman & Saunders, 1998). Today, the process of approving loans involves consideration of the personal

relationships between clients and loan officers as well as the examination of the clients' financial status (Lynch, 1996; Udell, 2008).

Consistent with his theories on bounded rationality, Simon (1955; 1956) proposed that the rules of the situation guide individual decision making. Because different situations foster different strategies, emphasis is placed on the importance of situational influence in the study of individual decision making. In organizations, the decision maker's task is to strike a balance between the decision that will produce the best outcome and the decision that conforms to situational rules or conventions (March, 1986; 1997). In banks, these rules and conventions differ, depending on the lending technologies used. There are a number of different ways banks assess risk using different types of quantitative information, for instance, financial statement lending, asset-based lending and credit scoring (Berger & Udell, 2006). Contrasted with these quantitative lending (transactional) technologies, there are qualitative lending (relationship) technologies (Boot, 2000). The latter are based on personal meetings with clients and include additional soft information that is used in the lending decision.

A fundamental observation in lending decision making is the asymmetry of information between the borrower and the lender (Akerlof, 1970; Healy & Palepu, 2001). Prospective borrowers have an advantage over lenders because they know more about their financial situations than the lenders could possibly know. To a great extent, the work of a loan officer therefore consists of balancing this information asymmetry. This is especially difficult for transactions involving opaque borrowers that lack formal financial records (Berger, Klapper, & Udell, 2001). One way a bank loan officer can deal with this fundamental problem is to demand high levels of security, for instance, collateral, and thereby reduce the risk of credit losses (Andersson, 2000). Second opinions are also used for evaluating lending decisions. Finally, bank organizational structure and loan size may

influence how loan decisions are made. In some cases, committees rather than individual loan officers make these decisions (Andersson, 2000; Silver, 2001).

Theoretical background

Lending technologies

Transactional lending – Why and how? In using a transactional lending technology, the loan officer either uses a manual scorecard with relevant information or a computerized, automatized system. The relevant borrower information includes, for example, gender, age and loan history (Thomas, 2000). Statistical models based on the results from a sample of established clients – the sample size may vary from a few thousand to hundreds of thousands – are used to calculate an overall score for the client's loan risk. This risk is a guide for the loan officer. In some systems, the risk calculated by the statistical models is advisory; in other systems, it is decisive. Although there are different credit-scoring systems, which involve different levels of statistical complexity, the commonality among them is that all are based on quantitative information derived mainly by automatized methods (Thomas, 2000).

Banks began to use transactional lending technologies in the mid-1960s. Chiefly because of the increasing number of consumer loans, there was a demand for more valid measures to assess loan applications (Hand & Henley, 1997; Showers & Chakrin, 1981). Scholars in the field of lending technologies argue that there are obvious benefits in using quantitative and, at least to some extent, more objective measures for assessing loan applications. The benefits include the following: less time required to assess loan applications and less risk of human bias in the assessment. In using a transactional lending technology, the evaluation procedure is standardized and performed in the same way, regardless of the client. Furthermore, computer software used for lending decisions permits quick implementation of changes in bank policies and risk measures. This technology is

thought to be more reliable than implementation by loan officers who may misinterpret a policy or misuse a measure (Rosenberg & Gleit, 1994). However, banks may not use transactional lending technology for all their loan applications, in particular in very complex situations. For the simpler situations, scoring models (a transactional lending technology), for example, may be used. The result is that loan officers have more time for more complex lending situations (Rosenberg & Gleit, 1994).

Since its introduction in banks in the 1960s, credit scoring has increased in the United States (Rosenberg & Gleit, 1994) and in Sweden (Wallander, 2002). By the early 1990s, over 80 per cent of U.S. banks used some kind of credit-scoring system (Jensen, 1992). Although some studies have evaluated the validity of credit scoring, empirical research on the topic is scarce. However, in a rather recent study, Blöchlinger and Leippold (2006) present evidence that indicates that more powerful credit scoring leads to significantly better credit portfolios. For a comprehensive review of credit scoring, see Hand and Henley (1997).

Relationship lending – Why and how? When banks were still regional and mainly served clients in close proximity, they conducted many of their credit assessments in personal meetings with their clients. Relationship lending focuses on soft information about clients, such as their personal characteristics and/or other information not derived from their financial data (Stein, 2002; Uchida, Udell, & Yamori, 2012; Udell, 2008). The use of relationship lending gives the loan officer the opportunity to collect confidential information that cannot be displayed in public financial data. Such information is confidential because, if made public, there may be various risks for the client. The loan officer uses such information to write contracts that are modelled to fit the client, to evaluate the collateral offered, and to develop long-term relationships (Boot, 2000).

It has also been shown that relationship lending makes it easier for first-time loan applicants or low-income applicants to obtain loans (Holmes, Isham, Petersen, & Sommers, 2007). Relationship lending, which helps balance the information asymmetry between the client and the

loan officer, is therefore especially helpful when making loans to opaque companies. Unlike more transparent companies, financial data for opaque companies cannot be retrieved from financial records (Uchida et al., 2012).

Two main problems with relationship lending are the soft budget constraint and the hold-up problem (Boot, 2000). The soft budget constraint refers to the potential problems that arise when a client does not fulfil its commitments, but the relationship between the bank and the client is so close that the loan officer hesitates to take action. The hold-up problem refers to the situation the client finds itself in when its bank has client crucial information that it can use to retain the client (Boot, 2000).

The use of relationship lending in banks imposes certain requirements on the bank as well as on the loan officer. The loan officer must collect information from the clients' environment, which often requires close proximity to the clients' factual surroundings (Agarwald & Housewald, 2010). This is more often a problem for loan officers at banks in larger cities (Udell, 2008). Relationship lending also benefits from bank decentralization because the information gathered through relationship lending is difficult to transfer to another department or bank office. Thus, the person who collects the information is the person best suited to evaluate and act upon that information (Berger & Udell, 2002; Uchida et al., 2012). Although relationship lending presents banks with opportunities to overcome the problems associated with informational opacity, questions have arisen about the quality of this information. There is no conclusive evidence that relationship lending generally yields more valid information than transactional lending (McNulty, Akhigbe, & Verbrugge, 2001). For a review of the relationship lending literature, see Boot (2000) and Udell (2008).

Psychological research on decision making in banks

Simon (1959) asked how much knowledge of psychology economists need. In posing the question, he noted that because the aims of economics research and psychological research differ, the two fields seek to explain different aspects of financial decision making. According to Simon, psychological research in economics has traditionally focused on descriptive microeconomics, whereas traditional economics research has focused on normative macroeconomics. In the psychological research on descriptive microeconomics, the researcher wants to understand the behaviour of the individual agent. Economics research concerns the behaviour of industries and the whole economy that guides decisions at the public policy level (Simon, 1959).

In a review of decision making in accounting settings, Libby and Lewis (1982) stated that, until the 1980s, human information processing was the most important aspect of research on decision making in such settings.¹ Their review showed that the focus of early research on individual decision making in accounting settings focused on four aspects – the interaction between information and the decision maker, the failure of individual decision makers to act in accordance with rational models, the methods decision makers use to search for information, and the postulates, hypotheses, and influence related to the decision makers' different cognitive styles. Libby and Lewis also noted that research on financial decision making until the beginning of the 1980s was mainly concerned with cognitive aspects, for instance, the use of heuristics and resulting biases. Research on intuition in management situations did not commence until the latter half of the 1980s (Hensman & Sadler-Smith, 2011). Since then, however, intuition has been a significant research issue in managerial and financial decision making (Agor, 1989; Hensman, & Sadler-Smith, 2011; Salas, Rosen, & DiazGranados, 2010).

¹ Not all the studies in the review deal with lending decision-making. However, many of the key components in other decision-making situations are similar to those in lending decision-making.

Assessment of information in lending decision making. Early studies on lending decision making primarily dealt with information processing. An experimental study by Casey (1980) showed that loan officers with access to considerable company information were not better at predicting bankruptcy than loan officers with less information. Subsequent studies have replicated this finding (Camerer, Lowenstein, & Weber, 1989; Chewning & Harrell, 1990; Hwang & Lin, 1999; Iselin, 1988). The conclusion is that the continuous effort to acquire more information in lending decision making (Casey, 1982) may not be the best path to improvement.

One study on how information assessment affects decision making shows that task size and the similarities among loan applicants affect lending officers' decisions (Biggs, Bedard, Gaber, & Linsmeier, 1985). For example, when loan officers evaluate loan applicants, a more complex task causes them to make greater use of non-compensatory decision strategies. In addition, when loan officers evaluate loan applicants, they search for information more thoroughly among those applicants with similar loan profiles.

Another study shows that the format of financial records influences loan officers' decision making (Klammer & Reed, 1990). Even when clients offer financial information that is relatively similar to other companies' financial information, the format of their financial statements influences the size of the approved loans. Additionally, loan officers make fewer task errors and understand the data better if financial statements are presented in simpler formats (Klammer & Reed, 1990). Kwok's (2002) study confirmed that the format of financial information (e.g., the format of the cash flow statement) affects lending decisions. Rodgers (1999) showed that when faced with conflicting information in a loan assessment, for instance, positive economic and management information versus negative financial statements, the novice lending decision makers were more likely than the expert lending decision makers to make a less thorough analysis of the different information and to neglect the negative information. However, Andersson (2004) found that lending experts did not

make better credit decisions than novices. Furthermore, a study of banks' commitment to problem loans suggests that expertise is not always successful. Staw, Koput, and Barsade (1997) showed that senior loan officers tend to retain problem loans based on the optimistic belief that such loans will eventually be profitable.

Other studies deal with assessments of information unobtainable from clients' financial records. These studies find that clients' personal characteristics (Buttner & Rosen, 1988; Hedelin & Sjöberg, 1993) and those of the loan officers (Belluci, Borisov, & Zazzaro, 2011) influence lending decisions.

Because the lending situation is often highly complex, involving time constraints and high levels of risk, loan officers may have difficulty in assessing loan requests rationally (Bowman & Ambrisoni, 2000). Therefore, the assumption is that they are forced to use intuitive processes (Jankowicz & Hisrich, 1987).

In recent years there has been a steady growth in the research on intuition in decision making, especially as related to lending (Hensman & Sadler-Smith, 2011; Lipshitz & Shulimovitz, 2007) and to management (Dane & Pratt, 2007; Miller & Ireland, 2005; Sadler-Smith, 2004). These studies conclude that intuition is a fundamental element of managerial decision making.

Theories of intuition and dual processes in human cognition

Intuition may be viewed uniquely or contrasted with analytic reasoning (Betsch & Glöckner, 2010). When viewing intuition and analytic reasoning together, theories of dual processes in human cognition may produce a better understanding of the two concepts as well as the interaction between them (Evans, 2010).

In the following section, I treat intuition separately and then compare intuition and analytic reasoning. Scholars differ in their use of labels for intuition and analytic reasoning. I will return to

this issue later, but throughout this section I use the dyad of intuition and analytic reasoning, as suggested by Betsch and Glöckner (2010), or Type 1 processing and Type 2 processing, as suggested by Evans and Stanovich (2013a), depending on the context. However, when referring to other researchers' studies, I use their definitions.

An introduction to intuition.

Consider the following remarks:

“...the concept of intuition seems to represent a broad variety of theories of knowledge, some of which characterize direct knowledge, some knowledge of unities, some telepathic or innate knowledge...this troublesome term...”

(Allport, 1929, p.15)

“...the semantic riddle of intuition remains to be solved.” (Bouthilet, 1948, p. 49)

“Intuition has been given so many meanings...that it makes one wonder whether the term has any meaning at all.”

(Epstein, 2008, p. 23)

These remarks indicate the difficulty in defining intuition in a scientifically satisfying way. Although the theoretical foundation for intuition is debated, studies have often shown that the concept of intuition is used frequently in such diverse areas as managerial decision making (Agor, 1986; Burke & Miller, 1999), mating customs (Inbar, Cone, & Gilovich, 2012) and, especially relevant for this thesis, lending decision making (Hensman & Sadler-Smith, 2011; Lipshitz & Shulimovitz, 2007). Hogarth (2001; 2005; 2010) claims that intuition is a fundamental part of human decision making. Kahneman (2011) and Gigerenzer (2007) agree.

Hogarth (2001) explains intuition in relation to the perils of process, content and correlates. First, the process of intuition is unconscious. It is a covert process (people cannot explain the process) that functions automatically (with little effort) and in most cases quickly. Second, the

content of intuition is knowledge or experience. Intuition can be diagnostic (explaining why something happened) and prognostic (predicting what will happen). Intuition can be based on both domain-specific knowledge and, in Hogarth's terms, cultural capital. Hogarth describes cultural capital as knowledge about social norms and other social interactions. Third (and here Hogarth refers to what intuition is not rather than what it is), intuition is not necessarily correlated with notions of speed or confidence. People often act on intuition quite rapidly, but sometimes they experience a slower form of intuition such as the nagging feeling of not knowing why they do not like another person. People are not always confident when acting on intuition, for example, when they are contradicted by analytic arguments. However, people may accept the analytic arguments but still believe that their intuition is correct.

Hogarth (2001, p. 14) concludes by stating that intuition or intuitive responses are “*reached with little apparent effort, and typically without conscious awareness. They involve little or no conscious deliberation*”. Dane and Pratt (2007, p. 40) add affect as an important component of intuition and define intuition as “*affectively-charged judgments that arise through rapid, non-conscious, and holistic associations*”. This definition is consistent with Kahneman's (2003, p. 1451) definition of intuition as “*fast, automatic, effortless, associative*”. Taking these three definitions of intuition together, we may conclude that intuition concerns the information process rather than the content, and that intuition is a cognitive and affective process that is automatic, requires little cognitive effort, and operates outside awareness. However, such a broad definition poses some problems.

Several studies on intuition claim that intuition should be viewed as an overarching construct for many different kinds of (intuitive) processes (Dane & Pratt, 2009; Dörfler & Ackermann, 2012;; Gore & Sadler-Smith, 2011). Because intuition does not necessarily function as a unitary construct, when measuring intuition researchers should be aware that there are different forms of intuition (Pretz & Tetz, 2007). First, intuition may be viewed as a process that is based on learnt behaviour

that manifests itself in heuristics, inferential intuition. Second, intuition may be viewed as a process encompassing a holistic assessment of a situation or a problem (Dane & Pratt, 2009; Pretz & Totz, 2007).

As intuition, in its fundamental form, merely describes a way of processing information, it may be reasonable to define intuition functionally. The study of intuition's connection to creativity (Dörfler & Ackermann, 2012) may result in different findings than if intuition is studied in association with decision making (Glöckner, 2007). Dane and Pratt (2009), for example, suggest that the often-cited opinion that intuition is closely interlinked with emotions (Hogarth, 2005; Sadler-Smith, 2008) may be true for moral decision situations but less so for problem-solving situations.

The validity of intuition. A fundamental and problematic issue concerns how successful intuition is compared with rational analysis in decision making. A tradition that stems from the research by Meehl (1954), supported by the heuristic and biases paradigm (Tversky & Kahneman, 1974), claims that human decision making often violates the axioms of rational choice theory and often underperforms compared with statistical models (Grove & Meehl, 1996). However, a question about the normativity of rationality has been raised (Gigerenzer & Selten, 2002; Stanovich, 2013). Stanovich's findings indicate that non-rational human decision making should be viewed in the light of a questioned rationality. Unlike animals, human beings focus on more than the sheer fundamentals of the problem – that is, people are more context-dependent than animals. When a human being makes a decision, in varying degrees contextual cues influence the decision. Moreover, such cues may have different values for different human beings. Taking contextual cues into consideration in decision making may have advantages in everyday life; however, in a controlled experiment, such cues may be evidence of irrationality.

Researchers who propose that using intuition for decisions is a successful endeavour have often used uncontrolled methods and even mere hearsay (Agor, 1986; see also Gladwell, 2005). The

fundamental question of how to measure a successful outcome has become an explicit problem in the research (Plessner & Czenna, 2007). Dijksterhuis (2004) and Dijksterhuis and Nordgren (2006) give examples of questionable outcome judgments using intuition. In these studies, outcome is measured by the satisfaction of participants with their choices after some time period. Plessner and Czenna (2007) reviewed intuition studies that examine less subjective outcome variables. Halberstadt and Levine (1999) created a “prototype study” (a term they use to describe an item that functioned like a comparison reference for other studies). In their study, basketball experts were asked to predict the outcomes of basketball games. Studies with such outcome criteria offer an excellent level of objectivity. In a review of 21 studies of this kind, these authors found that intuition, compared to rational analysis, performed better than, or as well as, in more than half of the studies. The conclusion of the review is not that intuition is always superior to rational analysis; however, the review does suggest that intuition is not always inferior to rational analysis.

Hogarth (2001; 2005), Hogarth and Karelaia (2007) and Kahneman and Klein (2009) focus on the interaction of the individual and the situation as a fundamental issue in evaluating the success of intuition in decision making. With his ideas about “kind” learning environments and “wicked” learning environments, Hogarth emphasizes that some contexts in which intuition is used are more favourable than others for achieving a successful outcome. A “kind” learning environment is an environment in which it is possible to obtain valid feedback on a decision. An example of a “kind” learning environment is weather forecasting. A weather forecaster’s predictions do not affect the outcome of their predictions – that is, the forecaster’s prediction of rain does not cause changes in rainfall that would confirm the prediction. Kahneman and Klein (2009) also address the situational influence on decision making with their proposal of high and low validity settings. They suggest that intuition can be advantageous in high validity settings. In such settings, a stable relationship exists

between cause and effect (e.g., a medical diagnosis). In low validity settings, there is an unstable relationship between cause and effect (e.g., stock market investments).

The interaction between an individual and a situational setting may explain the contradictory results on how expertise affects the validity of decisions (Burke & Miller, 1999; Dane & Pratt, 2009; Törngren & Montgomery, 2004). As suggested by, among others, Dörfler and Ackerman (2012) and Hogarth (2001; 2005), successful intuition requires expertise, which is the familiarity with and the knowledge relevant to the situation. However, in some situations, expertise is insufficient owing to the unpredictability of the situation. Then neither intuition nor rational analysis can be used to predict the outcome. Therefore, research on expertise in decision making should use objective measures to compare the success of expert decision makers to that of novice decision makers.

Törngren and Montgomery (2004) studied the objective success measure of stock market professionals who forecasted prices for twenty stocks. They then compared these forecasts with forecasts by novices. In their study, not only were the stock market professionals' forecasts no better than those of the novices, their forecasts were no better than chance when their forecasts were compared to real stock price movements.

In a similar study, Harteis and Gruber (2008) conclude that both induced information processing (intuitive or rational) and expertise (years of experience with the stock market) influenced the accuracy of stock price predictions. Individuals induced with an intuitive information processing style were more accurate than individuals induced with a rational information processing style. Moreover, experts made more accurate predictions than novices. Furthermore, experts made better decisions when induced with an intuitive information processing style than a rational information processing style while novices performed better when induced with a rational information processing style. Harteis and Gruber conclude that in complex and unpredictable environments, such as the stock market (in which complete information is not available), it is necessary to trust

intuition, which results in better decisions than rational analysis. However, intuition seem to rely on a high level of expertise to be successful.

The conclusion from this review of the research may be that the success of intuition in decision making depends on several factors. First, success needs to be clearly defined. Success can be defined using the axioms of rational choice theory or using outcomes in an externally valid environment. Second, the success of intuition (as well as of analysis) in decision making depends on the environment or setting. Intuitive success requires that accurate feedback is obtainable. Third, good intuitive decisions require expertise.

Characteristics of dual process theories of human cognition. Many researchers have investigated the dyad of intuition and rationality through the paradigm of the dual process theories of human cognition (Chaiken & Trope, 1999). A review of the vast literature in this area can increase our understanding of intuition. Dual process theories proposes that human beings use two different cognitive processes for decisions (Chaiken & Trope, 1999; Sloman 1996; Stanovich & West, 2000). Scholars, using different labels for the two processes, have attributed somewhat different meanings to them. However, it does not matter if the two processes are referred to as System 1 and System 2 (Kahneman, 2003), associative or rule-based (Sloman, 1996), or tactic and deliberate (Hogarth, 2001). All labels share some fundamentals.² Meyers (2002, p. 4) describes one process as “*automatic and unconscious*” and the other process as “*deliberate and conscious*”. Hogarth (2005, p. 68) distinguishes between the process that is “*sensitive to context and operates speedily providing approximate responses, typically without conscious awareness*” and the process that is “*mainly rule governed, precise, and capable of abstract thought*”. Kahneman (2003, p. 1451) uses the adjectives “*fast, automatic, effortless, associative*” for one system and “*slower, serial effortful and deliberately controlled*” for the other. Evans (2010) describes Type 1

² Referring to the different parts of dual process theories as either “processes” or “systems” has not yet resulted in an agreed-upon definition, which has weakened the theoretical foundations of the construct (Evans & Stanovich, 2013a). In this section, I use “process” rather than “system”, following Evans and Stanovich’s suggestion.

processing as “*fast, intuitive, high capacity*” and Type 2 processing as “*slow, reflective, low capacity*”. In this way, he clearly ties intuition to Type 1 processing. However, the use of “intuition” in describing Type 1 processing is somewhat problematic. As noted earlier, the term intuition should be handled cautiously as it may be understood in many different ways. The same is true of Type 1 processing.

The interaction between Type 1 and Type 2 processes. Evans (2010) concludes there are “default-interventionist” and “parallel-competitive” views of how Type 1 and Type 2 processes interact. In the “default interventionist” view (see also Kahneman & Frederick, 2002), Type 1 processes are the default option in decision making; Type 2 processes are used after conscious intervention. Type 2 processes occur because of notable differences in the default alternative, low confidence in the responses from Type 1 processes, or very important choices resulting in high levels of motivation. Whether the response from the Type 1 process, or an intuitive answer, is valid depends on the relevant experience an individual has about the choice.

The “parallel-competitive” view, exemplified by Sloman (1996), describes Type 1 and Type 2 processes in competition for resources without a default alternative. This explanation has been criticized because of the differences in processing speed (Evans & Stanovich, 2013a). Since Type 2 processes are much slower than Type 1 processes, it is difficult to see how both processes could be active at the same time. The Type 1 processes should be faster than the Type 2 processes. Furthermore, as Type 2 processes require considerable cognitive resources, they place high demands on working memory when used continually.

The general opinion is that Type 1 processing occurs at a constant pace, and Type 2 processing intervenes when highly important choices are required or when the initial Type 1 process-based reactions seem insecure (Evans & Stanovich, 2013a; Kahneman, 2011).

Criticism of the dual process theories of human cognition. In a recent debate on the validity of dual process theories, several influential researchers contributed their views on the theoretical

foundations and challenges of dual process theories. Here I consider some aspects of this debate. For more in-depth discussion, see Evans and Stanovich (2013a). See also comments on Evans and Stanovich's article (for example, Keren, 2013; Kruglanski, 2013; Thompson, 2013) as well as their reply to these comments (Evans & Stanovich, 2013b).

The main criticism of the dual process theories of human cognition, as summarized by Evans and Stanovich (2013a), concerns the validity of the defining properties of the two different processes and the view of dual processes as discrete concepts rather than continuous concepts. They also claim that a single account can explain the two processes, and complain of the scarcity of empirical evidence for the two processes. The criticism is summarized below.

First, because researchers have used their unique definitions of the two processes, the result is a too-broad definition. A consequence of this rather loose theory is that the agreement among the different definitions is low. Evans and Stanovich (2013a) deal with this criticism when they conclude that only two of the 16 definitions for each process are essential: (1) The use of working memory (yes/no); (2) automation (yes/demanding mental simulation). Thompson (2013) adds that although both Type 1 processes and Type 2 processes may be the result of automatic responses, they differ in one fundamental way. While Type 1 processing is automatic from beginning to end, Type 2 processing may be triggered automatically although its completion requires the involvement of working memory. Keren (2013) questions if the reduction of the many definitions leads to a test of working memory rather than a test of the dual process theory, given the additional problems of defining and measuring working memory.

Second, the discrete nature of the two processes leads to a problem of *isolability* (Keren & Schul, 2007, p. 539). These authors address the dyad as two systems rather than as two processes. They argue that for the dual process theory to be valid, the two systems should be isolable – that is, independent of each other. This means that System 1 should operate without the influence of

System 2, and vice versa. They also question the discrete nature of dual processes when they ask if System 2 can operate without the associative networks of System 1. Evans and Stanovich (2013a) responded by claiming that the critics confuse the constructs of dual processes and dual modes of thinking. According to Evans and Stanovich (p. 229), dual modes should be viewed as cognitive styles applied in Type 2 processes rather than as cognitive processes.

Third, Kruglanski and Gigerenzer (2011) argue that both Type 1 and Type 2 processes are rule-based. However, Evans and Stanovich (2013a) respond that the two processes do not necessarily differ on the underlying rules but on other aspects (see, for example, the first criticism).

Fourth, Evans and Stanovich (2013a) propose that three different research strands support dual process theory. (1): Experimental manipulations (e.g., time pressure and working memory load) affect performance on different tests such as exposure to bias (Evans & Curtis-Holmes, 2005). Both time pressure and increased working memory load are assumed to inhibit Type 2 processing that results in less analytic thinking. (2): Findings based on neuroimaging show that different regions of the brain are activated when performing traditionally Type 1 or Type 2 process-related actions, such as belief-based or reason-based responses. However, Keren (2013) charges there are methodological problems with neuroimaging. (3): Individual differences, such as the negative correlation between cognitive ability and exposure to some biases, strengthen dual-process theory. Keren (2013, p. 260) concludes his criticism of the two system theories as follows: “*they are too broad, they fail to specify any clear constraints, and thus are untestable*”.

Evans and Stanovich (2013b) address the theoretical constitution of their dual process theory by renaming it as a *metatheory*.

Conclusion of the use of dual process theories and theory of intuition in research. In his book, “*Thinking, fast and slow*”, Kahneman (2011) addresses the theoretical validity of dual process theories (theories

that to a large extent provide the foundation for his book). He defends his use of System 1 and System 2 by concluding, “*the fictitious systems make it easier for me to think about judgment and choice, and will make it easier for you to understand what I say*” (p. 30).

Evans and Stanovich (2013b) also consider this pragmatic view of dual process theory. They define dual process theory as “*a broad set of proposals of a particular kind*” (p. 268). With this definition, they conclude that current dual process theories will become more conclusive and testable theories in the future. This is true also for intuition. Intuition exists (several studies show that human beings experiences it daily) and should be examined more closely if we are to understand it better. However, as one of the forefathers of modern psychology, Johann Friedrich Herbart (1974) suggests, perhaps, at least for the moment, people should view intuition as a “*useful fiction*”³ (p. 46) rather than as a scientifically valid construct from which testable hypotheses can be derived.

Summarized conclusion. In conclusion, researchers engaged in the study of decision making are increasingly interested in the distinction between intuition and analytic reasoning. Furthermore, for a bank loan officer, intuition exists along with analytic reasoning when credit decisions are made. This difference between intuition and analytic reasoning for loan officers is therefore worthy of empirical research.

Summary of studies in this thesis

Study I

Study I is a systematic review of the empirical findings of bank loan officers’ lending decision making published in the years 2000 - 2011.

³ Herbart (1974) uses the term “useful fiction” to describe the role of mathematics in psychology when he writes about how astronomers view the heavenly sphere: “*What is the heavenly sphere? Is it a real valve, a real hollow sphere, on which we could draw spherical triangles? No, it is a useful fiction...*” (p. 46).

Method

We conducted a broad search for empirical articles using various databases. We selected articles on commercial loans but excluded consumer loans. We did not search for articles published before 2000 because this was the end-point of the latest review with a similar aim (Andersson, 2000). We distinguished between studies that focused on decision making using information assembled from stock markets and studies focused on decision making using information assembled from personal records or financial information. We excluded the former as this information collection process differs from the information collection process that loan officers use. Therefore, we excluded studies based on samples of stock traders. We included studies with samples of investment bankers, however, since their information assembly process resembles the information assembly process that bank loan officers use.

Results

The review of the literature shows that lending technology influences loan officers' decision making. Lending technology is used with both hard and soft information. Lending technology based on soft information, that is, personal relationships with clients, differs from transactional lending technology based on hard information, that is, financial information. The effects of lending technology are evident in loan officers' evaluation of the riskiness of loans approved and in the number of the loans they approve. However, the results are inconclusive as to which of the two technologies results in riskier loans or influences the number of loans approved. Some studies suggest that a lending technology mainly focused on the relationship between the loan officer and the client results in loans with greater credit risk (Degryse & van Cayseele, 2000; Jiménez & Saurina, 2004). Other studies conclude that transactional lending results in fewer high-risk loans (Berger, Frame, & Miller, 2005).

Studies of evaluations of loan information show that bank loan officers are subject to biases when they examine a client's loan request. First, loan officers tend to neglect information (such as cash flow analyses) with high predictive value of future bankruptcy (Houge & Loughran, 2000). Second, by altering their initial predictions, loan officers may be influenced by hindsight bias (Bias & Weber, 2009). Third, bankers seem to focus on past profits and market position to the extent that they neglect macroeconomic factors (Treacy & Carey, 2000).

Studies of how loan officers' expertise affects lending decision making reveal that experts, compared to novices, acquire more information before making decision, spend more time evaluating the information, and place less emphasis on education. However, experts do not perform consistently better than novices (Andersson, 2004; Bruns, Holland, Shepard, & Wiklund, 2008).

Intuition seems to be an important part of decision making at banks. Loan officers consider their gut feelings as valid cues for making sound lending decisions (Lipshitz & Shulimovitz, 2007). Factors such as loan officers' experience, age and knowledge influence the use of gut feeling in lending decision making as well as organizational conventions and restraints (Hensman & Sadler-Smith, 2011).

Conclusions

Study I concludes that lending technology influences how loan officers make credit decisions. This is a topic for future research. Furthermore, Study I concludes that information assessments are biased and that loan officers appear uninformed about the potential problems of an intuitive approach to loan assessment.

Study II

Study II explores how bank loan officers perceive they act when faced with difficult lending situations. We conducted Critical Incident Interviews in which loan officers were prompted to report difficult commercial loan decisions they had experienced recently.

Method

We conducted Critical Incident Interviews with 88 loan officers at the four largest banks in Sweden. One researcher contacted bank managers at these banks and asked them to ask various loan officers at their banks to participate in the study. All interviews were conducted at the loan officers' offices. With one exception, where the researcher took notes, all interviews were tape-recorded and transcribed. The interviews lasted about 10 minutes each. A qualitative content analysis was applied to the interview data in accordance with Flanagan's (1954) three main categories: situation, action and reason.

Results

The analysis of the critical incidents showed that the recalled situations differed depending on the client type and the risk level of the loan. The situations in which the loan officers experienced difficulties in making lending decisions occurred more often with existing clients than with new clients. Such difficulties also occurred more often in low-risk (versus high-risk) situations of an everyday nature.

Study II shows that there were no bank differences regarding analytic reasoning among the loan officers, but there were differences regarding intuition. Loan officers used analytic reasoning more than intuition to evaluate loan applications, regardless of their bank affiliation.

The difficult situations were classified as *Soft information* (source: client relationships), *Hard information* (source: financial data), *Mixed information* (source: forecasting), and *Other difficulties* (source: internal communications). More difficulties were reported with soft information than with hard information. We also identified some bank differences as far as reported difficulties.

Conclusions

Study II resulted in two main findings. First, loan officers reported they used analytic reasoning more than intuition to handle difficult lending situations. Second, loan officers reported that the majority of their difficulties related to soft information that cannot be obtained from financial records. Such difficulties (e.g., when to terminate a lending relationship) arose from the personal relationships between the loan officers and the clients.

Study III

Study III investigated the relative occurrence of two different thinking styles – experiential and rational – at five Swedish banks. Study III also examined how these thinking styles, in conjunction with other factors, influence the lending technology used by banks. Study III had two aims. The first aim was to investigate the occurrence of intuition (experientiality) and analytic reasoning (rationality) with a standardized instrument (The rational-experiential inventory: REI). Furthermore, Study III examined Study II's finding that loan officers mainly use analytic processes when making lending decisions. The second aim was to investigate how individual and organizational factors explain lending technology used at banks. In economics research, although not in the psychological research, lending technology has been described as an influential factor in lending decision making. Based on findings from previous research, information processing style and lending experience were

hypothesized to explain the use of lending technology. Bank affiliation was used as an organizational factor.

The study's three hypotheses were based on three conclusions from previous research. The first conclusion is that the type of information processing is connected to the type of information, and functions as a base for decisions (Inbar et al., 2010). The second conclusion is lending experience affects the type of information used as decision-base for lending decisions (Bruns et al., 2008; Rodgers, 1999). The third conclusion is that individuals make decisions in accordance with bounded rationality and in accordance with organizational norms (Levitt & March, 1988; Simon, 1955). These conclusions resulted in the following three hypotheses:

Hypothesis 1: Lending technology is expected to be positively related to thinking style. Individuals who favour experiential information processing will report a higher use of a relationship-based lending technology than individuals who favour experiential information processing.

Hypothesis 2: Lending technology is expected to be positively related to lending experience. Individuals with more lending experience will report a higher use of relationship-based lending technology than individuals with less lending experience.

Hypothesis 3: The influence of individual factors (i.e., thinking style and experience) on lending technology is expected to diminish when an organizational factor (e.g., bank affiliation) is introduced.

Method

A web survey was used with 134 loan officers at five Swedish banks. The loan officers' answers to questions on their thinking styles were measured using the Rational-Experiential Inventory (REI-40; Pacini & Epstein, 1999). The loan officers also answered questions on lending technology

(relationship-oriented or transactional) and their lending experiences. In addition, information was obtained on the loan officers' education, bank affiliation and lending experience.

Results

Index variables were constructed for rational thinking style, experiential thinking style, lending technology and lending experience. A hierarchical regression analysis was conducted with lending technology as the dependent variable. The independent variables were introduced into the analysis in three steps. In the first step, the two thinking styles were introduced. In the second step, lending experience was introduced. In the third step, bank affiliation was added to the model. The analysis showed that there was no effect from thinking styles on lending technology. Thereby, Hypothesis 1 was not supported. Lending experience, when controlling for thinking styles, had an effect on lending technology as hypothesized. More experienced loan officers used a more relationship-based lending technology. However, this effect disappeared when bank affiliation was introduced in the analysis. Thereby, Hypothesis 2 was supported. Hypothesis 3, that the influence of individual factors on lending technology would diminish once an organizational factor was included, was supported. This shows that lending technology mainly should be viewed as an organizational construct rather than an individual construct.

The findings also showed that there were no differences among banks as far as thinking styles. However, loan officers scored higher on rational thinking styles than experiential thinking styles in the four banks. This finding strengthens the results from previous studies on thinking styles in regulated environments (Calder et al., 2013; Sladek et al., 2008) and also adds to the discussion on the use of intuition and analysis in lending decision making (Hensman & Sadler-Smith, 2011; Lipshitz & Shulimovitz, 2007).

Conclusions

Lending technology should be viewed as a mainly organizational factor that is only partially influenced by individual factors such as thinking styles and lending experience. Furthermore, loan officers in our sample are more inclined towards a rational thinking style than an experiential thinking style.

Study IV

Study IV investigated the occurrence of the sunk-cost effect and its potential interaction with the two main information processes. We hypothesized that loan officers would be susceptible to sunk-cost effects and that the effects would be greater for loan officers who use intuitive information processing than for loan officers who use analytic information processing. Furthermore, we hypothesized that there would be an organizational effect of bank affiliation on the probability of loan approvals. These hypotheses were based on three conclusions from earlier research. The first conclusion is that individuals are influenced by previous decisions on investments for decisions about future investments. This behaviour – the sunk-cost effect – conflicts with rational choice theory that implies only future costs and benefits should affect decisions (Arkes & Blumer, 1985). The second conclusion is that the type of information processing– intuitive or analytic – influences the susceptibility to biases. Individuals are more vulnerable to biases when they use intuitive information processing than when they use analytic information processing (McElroy & Seta, 2003). The third conclusion is that previous research shows that bank affiliation is an influential factor in lending decision making, as related to lending technology and the use of intuition (Hensman & Sadler-Smith, 2011; Trönnberg, 2014). These conclusions resulted in the following three hypotheses:

Hypothesis 1: There is a main effect of the sunk-cost effect. Loan officers who previously have granted a loan to a company will rate the probability of granting the company a loan as higher than loan officers that have not previously granted a loan to a company.

Hypothesis 2: There is a main effect of bank affiliation on loan granting. The probability of granting a loan differs between banks.

Hypothesis 3: There is an interaction effect between the sunk-cost effect and type of information processing. Loan officers induced to using an intuitive type of decision making process will show higher vulnerability to the sunk-cost effect than loan officers induced to use an analytic type of decision making process.

Method

We used a web-based experiment in which 103 loan officers at small and medium-size banks were asked to rate the probability of approving a loan to six (hypothetical) companies. The loan officers were asked to base their lending decisions on the information in six scenarios. We prepared scenarios adapted from the real lending decisions that Arkes and Blumer (1985) used in their research. A 2 (Bias vs. No bias) \times 3 (Control vs. Analytic vs. Intuitive) between-subjects factors design with Latin-square counterbalancing of the scenarios was used. Participants were randomly assigned to one of the six Bias/No bias conditions.

The bias induction was manipulated through the construction of the scenarios. The scenarios in the Bias/No bias conditions were identical except for information about previous loans to the companies. In the Bias condition, the participants were informed that they had previously approved loans (which were defaulted on) to the company; now that company has requested another loan. In the No bias condition, participants were given no information about previously approved loans.

The information processing induction was manipulated through time pressure and direct instructions.

Results

Hypothesis 1 – that loan officers are susceptible to the sunk-cost effect – was supported. The loan officers thought it more probable they would approve a loan to a company if they had previously approved loans to that company. This finding is consistent with earlier studies on the sunk-cost effect (Arkes & Blumer, 1985; Brockner, 1992; Staw, 1997). Hypothesis 2 – that bank affiliation has an effect on the probability of approving a loan – was supported. This finding is consistent with earlier research that shows organizational effects in lending decision making (Hensman & Sadler-Smith, 2011; Trönnberg & Hemlin, 2014). Hypothesis 3 – that the sunk-cost effect is greater for loan officers induced with intuitive information processing – was not supported. This finding contradicts earlier findings (McElroy & Seta, 2003; Shiloh, Salton & Sharabi, 2002; Toyosawa & Karasawa, 2004). Furthermore, bank affiliation and information processing were shown to have effects on the probability of approving a loan.

Conclusions

Loan officers can be influenced by the sunk-cost effect. The type of information process (intuitive or analytic) used does not affect exposure to the sunk-cost effect. Furthermore, there is a bank affiliation effect on the probability of approving a loan application. Some banks are more inclined to approve loans than other banks. The type of information processing has a main effect on the probability of approving a loan application.

General discussion

This thesis examines influential factors in bank lending decision making. It focuses on how individual factors – such as thinking styles – and organizational factors – such as lending technology – affect loan officers' decision making. Furthermore, it investigates the occurrence and validity of intuition and analytic reasoning in lending decision making as well as loan officers' susceptibility to the sunk-cost effect.

The occurrence and validity of intuitive and analytic information processing in lending decision making

Studies II and III shed light on the occurrence of different ways to process information in lending. In Study II, the use of intuition and analytic reasoning was investigated using indirect measures. By asking participants about recent difficult lending decisions, we found that loan officers reported the predominant use of analytic information processes rather than intuitive information processes. In Study III, we measured the thinking styles among loan officers and found they generally were more inclined towards an analytic (rational) thinking style than an intuitive (experiential) thinking style. Although none of these studies, either separately or in conjunction, led to any definite conclusions about the use of intuition and analytic reasoning in bank lending, the results from the two studies suggest that analytic reasoning is used more than intuition.

This preliminary conclusion may be better understood when considering the theories of dual processes in cognition. First, depending on how the interaction between the processes is defined, the results can be interpreted in different ways. If one agrees with Sloman (1996) that intuition and analytic reasoning are constantly at work, the conclusion that one of the two processes is used more than the other on certain tasks and in certain situations may be valid. However, if one agrees with

Evans and Stanovich (2013a) and Kahneman (2011) that the default alternative for making assessments is always the intuitive process, the analytic process only intervenes when people are highly motivated or doubt their intuitive response. According to this theory, measuring the relative occurrence of different information processes may be considered trivial. However, the main question is not whether loan officers use one of the processes *exclusively* but rather which process they use *predominately*.

It may also be important to view lending decision making as sequences of different information processes rather than as a single information process that is used more frequently throughout the whole lending process. For example, in the initial meeting with the client, intuitive information processing may be used when forming an impression of the client. According to Hedelin and Sjöberg (1993), such impressions are highly influential on the lending decision. At a later stage, this impression is most probably accompanied by an analytically processed investigation of the financial information prior to the lending decision.

In Study IV, the validity of different information processes in lending was investigated. We found that information processing did not seem to affect the validity of lending decision making as a result of the loan officers' susceptibility to the sunk-cost effect. This finding contradicts previous research (De Neys, 2006; Shiloh et al., 2002) as well as the traditional notion of biases stemming from unconscious cognitive processes (Gilovich et al., 2000). In accordance with the guidelines from Glöckner and Witteman (2010) and the use of multiple inductions to induce intuitive and analytic information processing, the participants in our study did not report different attitudes towards intuitive or analytic information processes. Direct instructions had no effect. However, time pressure did have an effect although it did not make the participants feel more intuitive or more analytic. One could argue that following the postulates of dual process theories (Chaiken & Trope,

1999) time pressure is sufficient to induce information processing with lower degrees of awareness and thus is a more intuitive way of making decisions. The low degree of experienced intuitive information processing may rather be a consequence of the problems in reporting unconscious processes (Nisbett & Wilson, 1977). Furthermore, as the experience level of participants was high, one could also argue that they had reached a high level of expertise. A finding regarding expertise in decision making is that experts differ from novices in the use of pattern-matching for decisions (Klein, 1998). Experts often use cues to match a new decision with an old decision stored in memory outside their awareness. Thus, if experts are induced with an intuitive information process, they may not experience it as intuition but rather as their normal way of making decisions.

The non-functional induction of information processing in Study IV should be viewed in conjunction with the studies of self-reports of intuition (Nisbett & Wilson, 1977). Self-reports of intuition pose potential problems. We have shown that individuals who have severe time pressure placed on them for the completion of tasks did not experience more intuitive information processing than individuals with no such time pressure. This may be a consequence of the characteristics of our sample (e.g., loan officers with high levels of expertise). More research is needed to validate manipulation checks on intuitive information processing.

The importance of lending technology

Lending technology was fundamental in this thesis because it is a crucial issue in the economics literature on lending decision making (Boot, 2000; Udell, 2008). Guided by the theories of bounded rationality (Simon, 1955) and organizational learning (Cyert & March, 1963), we investigated the use of lending technology in lending decision making. Lending technology, from a psychological viewpoint, is of interest because it may affect the kind of information loan officers use in their decisions (Bruns et al., 2008; Rodgers, 1999).

In Study III, we found that lending technology should mainly be viewed as an organizational construct rather than as an individual construct. Loan officers' lending experience and thinking styles were not associated with lending technology when bank affiliation was taken into consideration. Additional analyses also showed that loan officers, to a great extent, followed their banks' regulations and policies for the use of lending technologies. This result showed the influence of organizational norms on individual decision making, and may be important when reviewing earlier studies on lending decision making. The generalizability of results from the studies conducted in one bank, or among banks with similar lending technologies, may be diminished. A result stemming from a bank that uses a transactional lending technology may not be generalizable to a bank that uses a relationship-based lending technology. However, the finding may be useful for practitioners. It is relevant for banks to know that individual loan officer characteristics (e.g., experience and thinking style) play a small role in lending decisions. Banks have few possibilities to change their product (e.g., money). Instead, they have to focus on aspects of their business strategy if they are to increase their market share. One such aspect is the interaction with clients by loan officers. The results from Study III suggest that banks differ in how they interact with their clients. This difference is a result of organizational differences rather than of loan officer differences.

Sunk-cost effects and information processing

In Study II, the results suggested that loan officers are susceptible to the sunk-cost effect in lending decisions. Study IV, which examined this finding by investigating the exposure to sunk-cost effect, revealed that the interaction with information processing was systematically varied. This interaction is of special interest for two reasons.

First, biases (such as the sunk-cost effect) occur when individuals make intuitive decisions rather than decisions based on analytic reasoning. If one makes decisions based on analytic

reasoning, the exposure to bias should be less than if the decision is made intuitively. Second, the validity of the different kinds of information processing (mainly the validity of intuition) has been debated in both the literature on intuition (Plessner & Czenna, 2007) and in the literature on lending decision making (Khatri & Ng, 2000; Lipshitz & Shulimovitz, 2007). Empirical studies on the validity of intuition are few in the latter literature, and the debate has largely been based on interview studies. Therefore, the results from Study IV are informative. Study IV shows that loan officers are susceptible to the sunk-cost effect. This finding supports the results of Study II and is consistent with previous research (Arkes & Blumer, 1985; Karlsson et al., 2005; Kernan & Lord, 1989). In a joint interpretation of the results from Study IV and the results from Study II, we can offer some explanations of the sunk-cost effect. Study II found that loan officers hesitate to end a client relationship, not only because of earlier financial transactions, but also because of earlier relational transactions. Several loan officers in Study II reported that they hesitated to terminate a client relationship because of emotional bonds with the clients.

We also found no interaction between information processing and the sunk-cost effect. This finding contradicts some earlier research on the information processing effect (Alós-Ferrer & Hügelschäfer, 2012; De Neyes, 2006; McElroy & Seta, 2003). These studies show that susceptibility to biases is higher when information is processed intuitively.

Implications for banks

Although the results of Study II suggest that intuition may not be used as frequently in lending decision making as some previous studies have claimed, it is clear that some loan officers do use intuition in these circumstances. Therefore, it is important in the training of loan officers to demonstrate the implications of the use of intuition for lending decisions. Loan officers need to

understand the potential benefits (Dijksterhuis & Nordgren 2006) and the potential costs (Tversky & Kahneman, 1974) of intuitive reasoning in loan approval/rejection decisions.

It may also be important in loan officers' training to emphasize strongly that they report the difficulties that the use of soft information may pose – difficulties that are greater than those posed by the use of financial information. This finding suggests that improvements in lending decision making should focus on the relational aspects of the lending decision rather than on the assessment of the hard information.

Study III shows that the organizational influence on loan officers is significant in lending decision making. This is a positive result for the banks in our study because it would have been problematic if the loan officers did not act according to the banks' regulations and policies. However, as loan officers largely adhere to bank regulations and policies, it is of course of vital importance that this adherence leads to valid decisions.

Because loan officers are susceptible to the sunk-cost effect, banks may experience loan losses as a result. Bank management should therefore strive to reduce this effect among their loan officers. Various suggestions about reducing the sunk-cost effect have been made. One suggestion is to monitor the loan performance in a way such that the loan officer takes responsibility for the process rather than for its outcome (Karlsson, Juliusson, & Gärling, 2005). Another suggestion is to limit banks' focus on future gains and instead focus on the current situation (Hafenbrack, Kinias, & Barsade, 2014). In addition, the lack of negative affect in decision making (from fear of mistakes) diminishes the sunk-cost effect. This suggests that a more tolerant climate in the workplace may be positive (Hafenbrack et al., 2014).

Limitations

One weakness of Study II is its methodology. The Critical Incident Technique relies on participants' memory retrieval of events. Although we specifically asked for recent critical incidents, some loan officers reported incidents from the more distant past. Because memory is reconstructive, some aspects of these incidents may have been recollected in a new light. As Nisbett and Wilson (1977) argue, the introspective access to cognitive processes may be small, and verbal reports may be flawed.

However, the Critical Incident Technique may have diminished the problems associated with verbal reports. First, we asked the participants to recall incidents that had occurred recently. Second, in asking for difficult incidents, we prompted participants to recall lending problems that were important to them. We found that both requests were useful in collecting valid reports. Therefore, the Critical Incident Technique decreases the validity of problems associated with verbal reporting (Ericsson & Simon, 1980; White, 1980). Furthermore, it is also claimed that the validity problem associated with verbal reporting has very severe negative consequences for research with a deductive aim (Ericsson & Simon, 1980). Since Study II is inductive, the severity of the problem is weakened.

Moreover, while there were acceptable inter-rater agreements between the different codings, the behaviour category showed lower agreement. The generalizability of Study II depends on the sample selection procedure. Because we did not use a random selection methodology, the possibilities for generalization are reduced. In addition, we acknowledge that there was a potential problem with dependence since, on occasion, more than one interview was conducted at a bank where more than one loan officer assessed the same loan. Thus, some loan officers may have described the same loan that we have treated as two separate loans. Finally, as noted above, we

asked for difficult loan situations only. The exclusion of easy loan situations may reduce the generalizability of our findings to loans in general.

The results of Study III should be viewed in the light of some methodological weaknesses. First, the measurement of lending technology has not been thoroughly tested previously. Further testing of this measure is needed before making a final assessment of the findings from Study III. Second, the measurements are based on self-reports rather than on loan officers' workplace behaviour.

In Study IV, a web-based questionnaire was used to conduct the experiment. There are several possible problems associated with the validity of the study's results. As we gathered data via the Internet, participants may have experienced motivational problems when completing the questionnaire; these problems could have affected the results. Because we did not have complete control over the questionnaire completion procedure, it is possible the participants did not follow instructions properly. However, a comparison of results from web-based studies and from traditional paper-and-pen studies shows that gathering data via the Internet achieves equally reliable results (Gosling, Vazire, Srivastava, & John, 2004). The more severe limitation of Study IV is that the information processing induction was only partly successful. Therefore, Study IV should be viewed in the light of these shortcomings.

Recommendations for future research

Researchers have noted the need for more systematic research on intuitive decision making. To date, most research in the area has been conducted as interview studies (Gore & Sadler-Smith, 2011). To advance the research, we recommend (1) more use of surveys or experiments and (2) more use of interviews with higher degree of structure, such as the Critical Incident Technique (see the recommendation by Gore and Sadler-Smith, 2011).

The effects of lending technology on lending decision making have not been widely investigated. The studies available, which use aggregated data, may therefore tell us little about the direct or indirect effects of lending technologies on loan officers' decision making. We recommend that researchers investigate lending technology as a potential factor in lending decision making. The effect of lending technology on risk-taking is an area of particular interest. We also recommend more exploration and testing of the measurement of lending technology. While the measure we used in Study III was acceptable for reliability, external validity requires further investigation.

An interesting and relevant field of research is the study of the validity of different decision making methods. In the research on lending decision making, studies with real-life outcomes have not been widely conducted since the 1970s. The explanation is the lack of access to banks' lending data (Andersson, 2000). It is therefore essential to convince the primary study object – the lenders – that research on the validity of lending decisions may have value for bank practice as well as for researchers. If such information becomes available, longitudinal studies or experimental studies should be conducted in which the results of different decision making methods can be validated in the context of bank loans.

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