**Dr. Patrick George Gerling**
Dipl.-Kfm., Dr. rer. pol.

# Debiasing: How Management Accounting Can Support Managers to Make Better Decisions

> *"Economics without psychological and sociological research to determine the givens of the decision-making situation, the focus of attention, the problem representation, and the processes used to identify alternatives, estimate consequences, and choose among possibilities – such economics is a one-bladed scissors. Let us replace it with an instrument capable of cutting through our ignorance about rational human behaviour."*
>
> (Simon, 1986, 40)

## 1. Introduction

Simon's statement remains valid to this day. When modeling managerial decision making, researchers still typically rely on rational approaches featuring a homo oeconomicus. He bases his decisions on all relevant information available, uses classical logical and statistical methods to evaluate this information and, taking his personal preferences into consideration, maximizes his expected utility. This allows deriving and explicitly communicating decision rules (Wagner 1991, 163; Fischer et al. 2004, 20). However as early as the 1950s, Simon demonstrated the inconsistency between the rational approach's underlying assumptions with everyday observations (Lingnau, 2001, 422). Since then many other studies, mostly empirical in nature, have confirmed Simon's observations. This is especially the case when dealing with complex problems or difficult decisions in an uncertain environment; rational approaches in these situations fall short of explaining how decisions are truly made in reality.

This paper, however, relies on a different approach. It uses behavioral and especially cognitive research to ascertain how management accounting can support managers to make better decisions. Even though the idea of integrating behavioral and cognitive research into management and specifically management accounting research is not completely new, it is still very rare. Lingnau is the first, and to my knowledge up to now the only researcher, who consequently uses cognitive research to derive a holistic management accounting concept (Lingnau, 2004, 736ff.; Lingnau, 2008, 4ff.). This paper discusses an extension of Lingnau's management accounting concept.

Decision making is pertinent and ubiquitous. Managers have to make decisions in a complex and uncertain environment on a daily basis. As managers, like all human beings have cognitive constraints they have to simplify information gathering, judgment and decision making. This is the only feasible strategy to make a decision at some point (Hogarth/Reder 1986, 1ff.: Anderson, 2001, 4). This paper focuses on systematic errors or cognitive biases in the decision making process of managers and how management accounting can help reduce or even avoid these biases through debiasing strategies. Despite its practical importance, management accounting research has up to now neglected the topic of debiasing completely (Gerling, 2007, 159 ff.).

The remainder of this paper is structured as follows: Section 2 analyzes how managers actually make decisions; Section 3 gives an overview of commonly studied biases in decision making and discusses related findings from the cognitive accounting research literature; Section 4 introduces general debiasing strategies and gives some specific examples of how management accounting can use debiasing strategies to improve managers' decisions; and Section 5 finally concludes.

## 2. How managers actually make decisions

Behavioral and cognitive science have two primary motives for research: develop scientific theories and improve decisions in everyday life (Hastie, 2001, 654). This paper focuses on how managers make decisions in their everyday professional life and to what extent management accounting can help to improve these decisions. Therefore this paper first briefly describes how managers actually arrive at decisions.

The managerial and organizational cognition theory, which evolved in the USA in the mid 1980's (Walsh, 1995, 280ff.), focuses on how managers act in the organizational context of a company and on the "subjectivity and the limitations of human information processing" (Hodgkinson/Jenkins, 2002, 177). Managers are seen as information workers and their main task is to make decisions (Walsh, 1995, 281). Generally, "the organization can be viewed as an information-processing and decision-rendering system." (Cyert/March, 1963, 20) There are several cognitive processes involved in decision making. A manager has to direct his attention to information he thinks is relevant, select information he can process, understand and judge the situation, look for possible alternative decisions, evaluate these alternatives, and finally make his decision (Medin et al., 2005; Matlin et al., 2005). Human behavior resulting in decisions is the consequence of these cognitive processes (Newell/Simon, 1972, 788; Coulam/Smith, 1985, 1f.). All steps are heavily influenced by the decision maker's general knowledge and fields of expertise (Walsh, 1995, 280).

The most important concept here is Simon's bounded rationality (Simon, 1957, 39ff. and 80ff.; March/Simon, 1958, 203ff.), which states that in reality decision makers cannot act rationally in an objective way, as their cognitive boundaries during information absorption, selection and processing do not allow this. As a result managers do not look for optimal solutions but strive for satisfying alternatives (Simon, 1955, 100f. and 254ff.; Argyris, 1973, 254ff.). The situational context determines what is seen as satisfying, depending on the aspiration levels of managers, which will rise if it is easy to find a solution and will be reduced otherwise (Selten, 1999, 14). Furthermore, every decision maker uses heuristics to free cognitive capacity. Heuristics are referred to as simple experience-based rules, rules of thumb, intuitive judgments, or simply common sense and help decision makers to enable and/or speed up decisions. The importance of heuristics rises especially when dealing with complex situations, involving uncertainty and incomplete information (Fischer, 2004, 241). Heuristics transform an unstructured, complex problem into a structured, well known and therefore simplified one (Mintzberg, 1976, 247). As managers have to regularly deal with unstructured problems in an uncertain environment they rely heavily on heuristics. It is important to stress that heuristics are important and work well under most circumstances, but can lead to systematic errors in certain cases (Medin et al., 2005, 465). These systematic errors are commonly referred to as cognitive biases, and measures to avoid or reduce these errors are referred to as debiasing.

## 3. Cognitive Biases

This chapter briefly introduces the most important, or better most discussed, cognitive biases in decision making. Generally, the term bias refers to a deviation from the decision expected from a homo oeconomicus who uses relevant logical and statistical rules (Jungermann, 2005, 170). Following short discussions of biases in general, this paper presents selected findings from the field of judgment and decision making research in accounting which is also referred to as cognitive accounting research. The goal of this chapter is to identify situations in which managers need support in order to make better decisions. "Nonetheless, […] unaided human judgment is often deficient in a number of deficient respects." (Hogarth, 1987, 209)

Decision making research commonly distinguishes between judgment and decision making (Eysenck, 2005, 481). Judgment implies the understanding of the situation in order to create a situational awareness of the decision and its context. Understanding covers the processes of perception and selection of information, and the formation of mental representation (Nerdinger, 2003, 76; Bonner, 1999, 385). Decision making deals with the actual choice between alternatives. Choices depend heavily on the mental representation and on the individual preferences of the decision maker. The preferences again determine how the decision maker deals with uncertainty and the valuation of probabilities (Bonner, 1999, 385). The last, but very important step is the use of feedback, because it initiates learning processes (Hogarth, 1987, 213ff.). There are different biases in every phase of the decision making process. Therefore this and the following chapter introduce biases and debiasing examples along the decision making phases (1) information perception and selection, (2) mental representation, (3) choice and (4) feedback.

**(1) Information perception and selection**

The information available inside a company is overwhelming. The only way to cope with this complex situation is to direct the attention towards certain information. The decision makers experience determines to a great extent what he regards as relevant (Wickens/Hollands, 2000, 303). It is extremely important to know which information attracts the decision maker's attention in which situation. In some cases this selection occurs consciously, in some unconsciously. On the one hand this filtering of information is absolutely necessary to deal with complex information, on the other hand the decision can be negatively affected if relevant information is excluded (Hogarth, 1987, 219f.). The following table summarizes some important perception and selection biases.

| Phase | Root Cause of Bias | Effect of Bias |
|---|---|---|
| **Judgment: Perception & Selection** | Missing information | Not looking for further information -> overestimation of knowledge |
| | Too much information | Cognitive overload -> additional information ignored |
| | Decision support systems | Uncritical trust in (not always relevant) information |
| | Prominently displayed information | Over-weighting of prominent information |
| | Intolerance of ambiguity | Over-weighting of quantifiable actual data |
| | Representativeness | Discover what is expected; ignore the unfamiliar |

Table 1: Biases during Information Perception and Selection

Generally the amount of information available influences the quality of judgments. There is a U-shaped correlation between amount of information available and quality of judgment. Therefore neither too little nor too much information improves decision making and there is a theoretical optimum of information that should be provided (Shields, M.D. (1983, 301). Deviant from general judgment research, representations in the field of accounting are more conservative and consistent when information is provided quantitatively (Dilla/Stone, 1997, 92).

Several papers analyze the choice of decision support systems as the management accountant already values the inputs by his choice of which system to implement. Hereby he determines the information available and influences judgments. *Ueker* who was one of the first researchers covering this topic e.g. stated: "The results of the experiment imply an inability of accountants to learn the most desirable information system for a decision maker." (Uecker, 1978, 181)

Another topic that has been covered in several papers is intolerance of ambiguity. Especially when confronted with complex, undefined or unfamiliar problems the selection of information depends on the intolerance of ambiguity of the decision maker. Individuals perceive complex and unpredictable situations as a threat and try to reduce this threat. A study discovered that the amount of information that is considered relevant rises with increasing intolerance of ambiguity. Further, decision makers tend to especially trust well defined and quantifiable internal data like e.g. actuals from accounting and avoid qualitative information and forecasts (Dermer, 1973, 511ff.).

**(2) Mental representation**

Decision makers heavily rely on their knowledge to mentally represent and judge situations. There are two principal strategies used to mentally represent a problem. If the individual believes to recognize the situation based on his past experiences, he forms an opinion without further information gathering. Especially experts in a specific field use these *one shot pattern classification*s (Wickens/Hollands, 2000, 310) which are the basis for *recognition-primed decision making* (Klein, 1993, 138 and 303; Phillips et al., 2004, 303f.). Further, under time pressure this often is the only viable strategy (Klein, 1993, 139). However, this simplification of the process can also lead to cognitive biases in certain situations (Gioia, 1986, 345ff.).

If a decision maker does not feel comfortable to form an opinion immediately, he takes his time and uses his expertise to represent the problem carefully. He gathers further information and keeps on hypothesizing until he has arrived at a for him satisfying hypothesis of the situation (Wickens/Hollands, 2000, 307ff.; Gibbins/Jamal, 1993, 455). Managers are often confronted with this sort of judgment process

as they have to incorporate and update information regularly in order to cope with the uncertainty of future developments (Ashton/ Hubbart, 1995, 6). Non-experts generally use the same strategy to come up with a judgment, although they predominantly have to rely on general heuristics due to lack of expertise. The following table 2 gives a brief overview over biases in the mental representation phase.

| Phase | Root Cause of Bias | Effect of Bias |
|---|---|---|
| **Judgment: Mental Representation** | **Knowledge-Based / Recognition-Primed Representation** | |
| | Representativeness heuristic | Illusion of validity -> search for information validating initial understanding; no search for contradicting information |
| | | Conjunction fallacy -> assumption that specific conditions are more probable than general ones |
| | | Gambler's fallacy -> tendency to assume that future probabilities are influenced by past events, when in reality they are unchanged |
| | | Over-weighting of extremely high or low values of a random variable -> neglecting regression towards the mean |
| | Availability heuristic | Over-weighting if knowledge or an event is easily brought to mind |
| | | Functional fixation: mental block against using a known solution in a new way that is required to solve a different problem |
| | **Representation with Belief Adjustments** | |
| | Anchoring and adjustment | Tendency to rely too heavily, or "anchor," on an initial (random) value and not adjust this initial value appropriately |
| | Primacy and recency effects | Over-weighting of first and last information presented |
| | Overconfidence bias | Excessive confidence in own knowledge -> search for additional information stopped too early |
| | Confirmation bias | Search for or interpret information in a way that confirms preconceptions |
| | Illusion of control | Over-estimation of control or at least influence on outcomes that they clearly cannot or hardly influence. |

Table 2: Biases during Mental Representations

Related cognitive accounting research mainly deals with different aspects of the belief adjustment model. Many papers analyze the use of cost accounting information as a starting point to determine resource utilization and estimate market prices. Most authors assume that managers e.g. use cost information as an initial estimate to predict market prices and adjust these estimates taking further information into consideration. The anchor, in this case the cost information, determines the quality of the judgments. The adjustment processes are also of great importance as they can compensate for inaccurate cost data. Adjustment processes based on performance feedback significantly improved resource allocation decisions (Gupta/King, 1997, 105 and 121). The incorporation of the price policy of benchmark firms also lead to significantly better results (Briers et al., 1999, 90). Companies often base their pricing decisions on cost information in the first period and adjust these decisions in the following periods based on market feedback (Waller et al., 1999, 717f.). A further paper showed that the use of activity-based costing has a positive effect on pricing decisions (Cardinaels et al., 2004, 143; Dearman/Shields, 2001, 15). Management accounting has to generally decide for every context, if improved cost accounting which leads to an improved anchor or improved adjustment processes has a more favorable cost-benefit ratio (Gupta/King,

1997, 122). "Thus, given the availability of multiple sources of information, a more cost-effective approach may be to provide an array of information in a systematic way, rather than concentrating resources on perfecting cost system design." (Briers et al., 1999, 90)

Decision makers tend to evaluate the cost accounting system they use too uncritically. They look for information that is in line with the system and do not pay the required attention to contradictory data (confirmation bias). Frequent users of cost accounting systems are especially resistant to change (Jermias, 2001, 154f.). One paper analyzed the introduction of a new cost accounting system; if e.g. a company introduces a variable costing system and worked with an absorption costing system before, the interpretation or mental representation of the cost data has to change accordingly. Most users keep on using the cost information the same way as before, demonstrating functional fixation (Dearman/Shields, 2005, 351). Even after communicating and explaining the change of the cost accounting data, more than half of the probands kept on using the data the same way as before the change (Ashton, 1976, 16; Dyckman et al., 1982, 8).

**(3) Choice**

In most cases the mental representation as well as the consequences of possible decision alternatives are uncertain. Therefore the most important task in the choice phase is the estimation of probabilities on which the decision will be based. Expected utility theory models how rational decisions should be made on the basis of objective values (Plous, 1993, 80f.). Based on the observation that expected utility can often not explain human decision behavior Kahneman and Tversky introduce the subjective value of an alternative which can differ from the objective value. Their Prospect Theory is the basis for most research related to the actual decision making or choice phase. Decision makers do not value alternatives in absolute measures but against their individual reference points as relative gains or losses. Their value function is defined on deviations from their individual reference point and is normally concave for gains (leading to risk aversion), commonly convex for losses (leading to risk seeking) and is generally steeper for losses than for gains (leading to loss aversion). The decision maker estimates decision weights which are generally lower than the actual probabilities. Only very small probabilities are overestimated and very high probabilities are considered certain (certainty effect) (Kahneman/Tversky, 1979, 263ff.). As decision makers value alternatives relative to their perceived reference points as gains and losses, the framing of the context as a gain or a loss can heavily influence the choice of an alternative (Kahneman/ Tversky, 2000, 150ff.; Schäfer/Vater, 2002, 742f.). The following table briefly summarizes biases in the choice phase.

| Phase | Root Cause of Bias | Effect of Bias |
|---|---|---|
| **Decision Making: Choice** | S-shaped asymmetric value function defined as deviation from individual reference point | Risk aversion for gains and risk seeking for losses |
| | | Losses of a certain value have a bigger impact than gains of the same absolute value -> loss aversion -> sunk-cost effect |
| | Subjective decision weights | Over-weighting of very low and very high (certainty effect) probabilities; under-weighting of other probabilities |
| | Framing effect | Decision framed as gain or loss -> determined through reference point |
| | | Mental accounting -> money is divided into different mental accounts -> mentally not transferable -> not every dollar is perceived the same |

Table 3: Biases during Choice of Alternatives / Decision Making

There are several papers in cognitive accounting research that analyze framing effects and in how far the way information is presented influences managers' decisions. Many of these papers analyze budgeting decisions. Managers as well as lower-level staff significantly act risk averse when they are in a good position generating gains and risk seeking otherwise (Kim, 1992, 316; Chang et al., 2002, 55). They e.g. plan budgets which are too high (budgetary slack) and which they can easily achieve, so that they do not risk their personal gains (Young, 1985, 830f.). A study around capital budgeting decisions derives similar results (Sullivan/Kida, 1995, 82).

**(4) Feedback**

After a decision has been made, feedback is important to evaluate the decision. This evaluation is the first step to build up new knowledge and to improve future decision making (Bransford/Stein, 1993, 36; Hogarth, 1987, 213; Einhorn/Hogarth, 1981, 23ff.). Unfortunately, it often is difficult to compare the decision made to other alternatives. If a manager e.g. made a decision to hire somebody, it is not possible to compare that decision with the alternative of having hired someone else (Connolly et al., 2000, 301.). The following table briefly describes some commonly studied biases related to feedback.

| Phase | Root Cause of Bias | Effect of Bias |
|---|---|---|
| **Feedback** | Hindsight bias | Tendency to view things which have already happened as being relatively predictable -> Over-estimation of own past judgment |
| | Self fulfilling prophecy | Wrong initial judgment determines decision -> better alternatives have not been considered |
| | Sunk costs | Reference point determines the interpretation of feedback |

Table 4: Biases during Feedback

Managers tend to stick to unsuccessful projects. After initially deciding to invest in a long-term project, managers have to regularly decide if they want to further pursue the project. Theoretically, at every decision point only relevant future costs and revenues should be considered. Nevertheless, managers often also include irrelevant sunk costs like e.g. already invested capital as well as personal involvement into their considerations (Sharp/ Salter, 1997, 116f.; Bazerman, 1998, 68). This often leads to a continuation of unprofitable projects. This phenomenon is referred to as managerial escalation situation or escalation of commitment (Kadous/Sedor, 2004, 55; Gosh, 1997, 88). The reason for this behavior is mostly explained through a combination of the confirmation bias and framing effects (Sharp/Salter, 1997, 103f.). Managers tend to ignore or misinterpret negative feedback and actively look for information that justifies a

continuation of the project. Further, as the manager has initiated the unprofitable project, he sees himself in a loosing frame and therefore is risk seeking which leads to prolonging the project (Bazerman, 1998, 73f.). An intercultural study shows that framing effects explain the inclusion of sunk costs in managers' rational in North America to the same extent as in Asia (Gosh, 1997, 88).

## 4. Debiasing

"Debiasing is likely to be a challenging direction for future research"
(Ashton, 1995, 23)

Generally, the goal of management accounting is to use its expertise in the fields of e.g. cost accounting, corporate finance, shareholder value analysis and capital budgeting in order to support managers to improve their operational, tactical and strategic decision processes. Management accounting supports managers in three ways: preparing information, designing tools managers can use or acting as an internal consultant preparing decisions together with management (Lingnau, 2006, 17f.). This chapter does not only focus on what knowledge management accounting provides but also how knowledge is provided. Management accounting has to take possible biases in managerial decision making into account and help managers to avoid biases. "Accepting the existence of a normative-descriptive gap raises the question of how the gap might be closed." (Larrick, 2004, 316)

Biases have been studied for more than 30 years in many different contexts. Nevertheless, up to date only a few researchers are actually studying how to avoid biases. Most of these researchers work in the field of judgment and decision making. Articles discussing strategies how management accounting can help managers to reduce or avoid cognitive biases through debiasing strategies do practically not exist. Therefore the following section briefly introduces general strategies from the judgment and decision making research literature. Based on these debiasing strategies and selected findings from the cognitive accounting research, this paper discusses possible debiasing strategies.

Simply creating awareness of cognitive biases in most situations is no effective debiasing strategy. Basically, there are three fundamental debiasing strategies: motivational strategies, cognitive strategies and technological strategies. Motivational strategies use incentives to motivate decision makers to replace intuitive decision making with more normative approaches. This approach implies that individuals are capable of using normative decision rules (Larrick, 2004, 316ff.). Empirical studies show that especially when dealing with complex problems, motivational strategies do not have a positive effect. On the other hand, this strategy can improve decisions related to simple tasks. (Camerer/Hogarth, 1999, 33). Cognitive strategies aim at improving the decision process. This improvement mainly bases on learning and the development of expertise. Organizational programming or training are two ways to educate decision makers (Nisbett et al., 1983, 339f.). Technological strategies directly influence the decision maker. Examples are the use of decision aids that help to structure a decision process or statistical models that replace intuitive judgments of probabilities (Larrick, 2004, 318). Generally, technological strategies help non-experts in the phases of judgment and decision making. Cognitive strategies are especially important to build up expertise in the feedback phase. Experts generally tend to make less biased decisions, as they base their decisions more on expertise and less on general heuristics like rules of thumb (Phillips et al., 2004, 298). Accounting experts e.g. show less biases in the field of accounting (Smith/ Kida, 1991, 485f.). As managers mostly are no management accounting experts debiasing related to accounting information

therefore is especially important. Generally, debiasing efforts, of course, only make sense if the benefits are higher than the costs associated with implementing debiasing strategies. (Lewis et al., 1983, 271)

The following section derives recommendations of how management accounting can use debiasing strategies in order to improve managerial decision making.

**(1) Information perception and selection**
Decision makers need the right amount and content of information so that they can understand and judge the context of a decision as well as possible. Management accounting plays an important role in this phase in preparing and presenting relevant information to managers. The management accountant selects and aggregates information and hereby influences decisions significantly. (Shields, 1983, 301) *Rose* and *Wolfe* further show that decision aids that provide less information lead to improved learning processes (Rose/Wolfe, 2000, 285). Salient information is perceived as more important. Management accounting therefore has to make sure that the way information is presented does not negatively influence judgments.

Generally, managers tend to rely on information provided to them uncritically, this is especially true for accounting information. Thus decision aids should be implemented that foster critical thinking and lead to additional information requests especially when dealing with complex and/or important decisions. Some studies suggest that presenting information frequency-based and not probability-based improves the intuitive use of statistical methods. This helps to debias the overconfidence bias, the conjunction fallacy and the illusion of control as the common tendency to misjudge probabilities and variances does not occur (Gigerenzer/ Hoffrage, 1995, 697).

**(2) Mental representation**
Decision makers demonstrate recognition-primed biases mostly when they rely uncritically on their knowledge. They over-estimate their expertise or use their knowledge in a wrong way. The cognitive rule "consider the opposite" is one effective way to reduce recognition-primed biases. Management accounting should provide information and tools that incorporate this rule and guide managers to judge critically. Decision support systems e.g. can direct the attention to contrary positions. (Larrick, 2004, 323f.) Especially when dealing with complex problems managers and management accountants should work together. The role of the management accountant is to find arguments for contrary positions and enrich judgments. This strategy will also reduce confirmation biases (Hammond/ Keeney/Raiffa, 2006, 123).

Functional fixation prevents us from using existing knowledge in a new way and has been analyzed in several studies. These studies analyzed strategies to avoid functional fixation, but could not prove the effectiveness of debiasing strategies (Marchant, 1990, 100f. ; Arunachalam/Beck, 2002, 23f.; Dearman/Shields, 2005, 374). Managers tend to apply their expertise to fields where they are novices. They rely on the representativeness heuristic which often leads to the illusion of validity and the availability heuristic. The uncritical use of these heuristics can lead to incorrect judgments. Disaggregating and therefore simplifying judgments generally helps novices to improve their judgments. These judgments then tend to be less intuitive (Wickens/ Hollands, 2000, 329). *Bonner et al.* e.g. show that decision aids have a positive effect. A simple checklist and tools for disaggregating complex problems improve judgments (Bonner et al. , 1996, 237f.).

Judgments that use belief-adjustments often demonstrate the inappropriate use of heuristics. A study analyzing the ability of weather forecasters to predict the probability of precipitation showed that they tend to over-estimate their ability to make correct judgment (overconfidence bias). Introducing a systematic analysis of past judgments significantly debiased the overconfidence bias (Jungermann et al., 2005, 189). Thus, one role of management accounting should be to provide data to enable management to analyze their decisions and initiate learning processes. The anchoring effect states that individuals tend to use the first available information as an anchor for their judgments. This leads to biased judgments and is a very robust effect (Hammond et al., 2006, 121). Explicitly pointing out that the most relevant data should be taken as an initial anchor for a judgment helped to debias this effect (Wickens/ Hollands, 2000, 327). Management accountants often set anchors, in e.g. providing cost information, which serve as a starting point for managerial decisions. Especially when dealing with important decisions, the quality of the initial information provided can have significant impact on future profits.

**(3) Choice**

Framing effects are very common in the accounting context and thus, should be addressed by management accounting (Chang et al., 2002, 38). Using different techniques as cognitive causal maps or evidence rating address framing effects. Both tools force the decision maker to explicitly think about and write down advantages as well as disadvantages of different alternatives. These techniques redirect the attention from the initial frame to relevant facts and significantly reduce framing effects (Emby/Finley, 1997, 71). Management accounting can therefore avoid framing effects if it offers information clearly stating (monetary) advantages and disadvantages of alternatives or creates standardized, objective reports (Chang/Yen, 2002, 38).

**(4) Feedback**

Feedback and learning from decisions is important to build up knowledge. This again leads to better decision making and helps to reduce biases (Shanteau, 1992, 257ff.; Wickens/Hollands, 2000, 326f.). Retrospectively, individuals tend to see past judgments better than they were (hindsight bias). As a result, the hindsight bias to some extent prevents learning (Matlin, 2005, 443; Arkes et al., 1988, 307). Management control systems are a very good source of feedback which helps managers to evaluate past judgments and decisions. This should foster self-critical thinking, improve the awareness of past judgments and help improve future decisions (Larrick, 2004, 323ff.). Furthermore, it is important to provide feedback shortly after the decision has been made as this also reduces the hindsight bias (Wickens/Hollands, 2000, 326). Explicitly stating one arguments for and one against an alternative during the decision making process also reduces the hindsight bias (Arkes/Faust, 1988, 307).

Managers tend to continue unprofitable projects due to the sunk cost effect. Feedback reduces this effect and helps to refocus on information which is relevant for the project continuation decision (Gosh, 1997, 102). Management accounting should serve as an objective internal consultant in order to avoid escalation of commitment.

## 5. Conclusion

The main goal of this paper is to create awareness of the need for debiasing research in the field of management accounting. Debiasing research generally is very rare and fragmented; and there are practically no studies that directly address management accounting. Management accounting will never

be able to eliminate all biases in managerial decision making, but it can improve decisions significantly. In order to understand and assess management accounting's full potential in this field, substantial research is required. Hopefully researchers will follow this path in order to better use this potential benefit of debiasing strategies. This will help management accounting to further improve managers' decision making processes. The concluding citation is taken from the 2004 "Handbook for Judgment and Decision Making", but it is definitely even more true for the field of management accounting: "The full range of issues must be dealt with in order to demonstrate the value of the debiasing approach, and so far, progress has been remarkably limited." (Phillips/ Klein/ Sieck, 2004, 298)

## Summary

The task of managers on all levels consists of making decisions. Like all human beings, managers have cognitive restraints and therefore cannot decide rationally in all situations (bounded rationality). When confronted with complex problems in an uncertain environment, they are not able to process all relevant information and they cannot be experts in all relevant fields. Taking this into account, this paper does not base on unrealistic assumptions of how managers should decide (as a homo oeconomicus), but on how managers in reality do decide. Managers use heuristics during the decision making process. These heuristics simplify the decision process and therefore enable managers to cope with the multitude of decisions they have to make every day. Nevertheless heuristics often lead to systematic errors, or cognitive biases, which negatively affect decisions. Debiasing addresses the role of management accounting to improve managerial decision making by reducing cognitive biases. Up to date there are practically no studies that directly address debiasing in a management accounting context. This paper discusses this issue and herefore uses up-to-date research from the fields of cognitive psychology, judgement and decision making and management accounting.

## Zusammenfassung

Manager auf allen Ebenen, haben die grundsätzliche Aufgabe, Entscheidungen zu treffen. Manager unterliegen, wie alle Individuen, kognitiven Beschränkungen (bounded rationality) und können daher nicht in allen Situationen rational entscheiden. Sie verfügen nicht über die kognitiven Kapazitäten, um in einer von Unsicherheit geprägten Welt alle relevanten Informationen zu verarbeiten und sie können nicht auf allen relevanten Gebieten Experten sein. Dieser Artikel untersucht, wie Manager im Unternehmenskontext tatsächlich entscheiden und nicht, wie sie theoretisch entscheiden sollen. Manager nutzen während des Entscheidungsprozesses Heuristiken. Die Nutzung von Heuristiken vereinfacht den Entscheidungsprozess und ermöglicht es Managern erst, täglich die Vielzahl von Entscheidugen treffen zu können. Nichtsdestotrotz führt die Nutztung von Heuristiken oft auch zu systematischen Verzerrungen oder Biases, welche Entscheidungen negativ beeinflussen. Debiaising beschreibt die Aufgabe des Controllings, kognitive Verzerrungen abzumildern, um die Entscheidungsprozesse von Managern zu verbessern. Bis heute gibt es praktisch keine Debiasing Forschung im Bereich Controlling. Dieser Artikel diskutiert diese Thematik und nutzt hierzu aktuelle Forschungsergebnisse aus den Bereichen kognitive Psychologie, Judgement and Decision Making sowie Controlling.

**Literature**

1. Anderson, J. R. (2001): Kognitive Psychologie, 3. Aufl., Heidelberg et al. 2001.
2. Argyris, C. (1973): Some Limits of Rational Man Organizational Theory. In: Public Administration

Review, 33 (1973), H. 3, S. 253-267.
3. Arkes, H. R. / Faust, D. / Guilmette, T. J. / Hart, K. (1988): Eliminating the Hindsight Bias. In: Journal of Applied Psychology, 73 (1988), H. 2, S. 305-307.
4. Arunachalam, V. / Beck, G. (2002): Functional Fixation Revisited: the Effects of Feedback and a Repeated Measures Design on Information Processing Changes in Response to an Accounting Change. In: Accounting, Organizations and Society, 27 (2002), H. 1-2, S. 1-25.
5. Ashton, R. H. (1976): Cognitive Changes Induced by Accounting Changes: Experimental Evidence on the Functional Fixation Hypothesis. In: Human Information Processing in Accounting, 14 (1976), S. 1-17.
6. Ashton, R. H. / Hubbart Ashton, A. (1995): Perspectives on Judgement and Decision-Making Research in Accounting and Auditing. In: Ashton, R. H. / Hubbart Ashton, A. (Hrsg.): Judgement and Decision-Making Research in Accounting and Auditing, New York et al. 1995, S. 3-25.
7. Bazerman, M. (1998): Judgement in Managerial Decision Making, 4. Aufl., New York et al. 1998.
8. Bonner, S. E. / Libby, R. / Nelson, M. W. (1996): Using Decision Aids to Improve Auditors' Conditional Probability Judgements. In: The Accounting Review, 71 (1996), H. 2, S. 221-240.
9. Bonner, S. (1999): Judgement and Decision-Making Research in Accounting. In: Accounting Horizons, 13 (1999), H. 4, S. 385-398.
10. Bransford, J. / Stein, B. S. (1993): The Ideal Problem Solver: a Guide for Improving Thinking, Learning, and Creativity, 2. Aufl., New York 1993.
11. Briers, M. L. / Chow, C. W. / Hwang, N. R. / Luckett, P. F. (1999): The Effects of Alternative Types of Feedback on Product-Related Decision Performance: A Research Note. In: Journal of Management Accounting Research, 11 (1999), H. 1, S. 75-92.
12. Camerer, C. F. / Hogarth, R. M. (1999): The Effects of Financial Incentives in Experiments: A Review and Capital-Labor-Production Framework. In: Journal of Risk and Uncertainty, 1-3 (1999), H. 19, S. 7-42.
13. Cardinaels, E. R. F. / Warlop, L. (2004): The Value of Activity-Based Costing in Competitive Pricing Decisions. In: Journal of Management Accounting Research, 16 (2004), H. 1, S. 133-148.
14. Chang, J. C. / Yen, S. / Duh, R. (2002): An Empirical Examination of Competing Theories to Explain the Framing Effect in Accounting-Related Decisions. In: Behavioral Research in Accounting, 14 (2002), H. 1, S. 35-64.
15. Connolly, T. / Arkes, H. R. / Hammond, K. R. (2000): Experts. In: Connolly, T. / Arkes, H. R. / Hammond, K. R. (Hrsg.): Judgement and Decision Making - An Interdisciplinary Reader, Cambridge, UK 2000, S. 301-303.
16. Cyert, R. M. / March, J. G. (1963): A Behavioral Theory of the Firm, Englewood Cliffs, NJ 1963.
17. Dearman, D. T. / Shields, M. D. (2001): Cost Knowledge and Cost-Based Judgment Performance. In: Journal of Management Accounting Research, 13 (2001), H. 1, S. 1-18.
18. Dearman, D. T. / Shields, M. D. (2005): Avoiding Accounting Fixation: Determinants of Cognitive Adaptation to Differences in Accounting Method. In: Contemporary Accounting Research, 22 (2005), H. 2, S. 351-384.
19. Dilla, W. M. / Stone, D. N. (1997): Response Scales in Risk Judgements: The Effects of Representation, Fineness and User Choice. In: Journal of Information Systems, 11 (1997), H. 2, S. 75-96.

20. Einhorn, H. J. / Hogarth, R. M. (1981): Behavioral Decision Theory: Processes of Judgement and Choice. In: Journal of Accounting Research, 19 (1981), H. 1, S. 1-31.
21. Emby, C. / Finley, D. (1997): Debiasing Framing Effects in Auditors' Internal Control Judgement and Testing Decisions. In: Contemporary Accounting Research, 14 (1997), H. 2, S. 55-77.
22. Eysenck, M. W. / Keane, M. T. (2005): Cognitive Psychology - A Students Handbook, 5. Aufl., Hove, UK 2005.
23. Fischer, P. / Greitemeyer, T. / Frey, D. (2004): Individuelles Entscheidungsverhalten. In: Schreyögg, G. / Werder von, A. (Hrsg.): Handwörterbuch Unternehmensführung und Organisation, 4. Aufl., Stuttgart 2004, S. 239-247.
24. Gerling, P. (2007): Kognition und Controlling, Lohmar, 2007.
25. Gibbins, M. / Jamal, K. (1993): Problem-Centred Research and Knowledge-Based Theory in the Professional Accounting Setting. In: Accounting, Organizations and Society, 18 (1993), H. 5, S. 451-466.
26. Gigerenzer, G. / Hoffrage, U. (1995): How to Improve Bayesian Reasoning without Instruction: Frequency Formats. In: Psychological Review, 102 (1995), H. 4, S. 684-704.
27. Gioia, D. A. (1986): Conclusion: The State of the Art in Organizational Social Cognition: A Personal View, San Francisco, Cal. et al. 1986.
28. Gosh, D. (1997): De-Escalation Strategies: Some Experimental Evidence. In: Behavioral Research in Accounting, 9 (1997), H. 1, S. 88-111.
29. Gupta, M. / King, R. R. (1997): An Experimental Investigation of the Effect of Cost Information and Feedback on Product Cost Decisions. In: Contemporary Accounting Research, 14 (1997), H. 1, S. 99-127.
30. Hammond, J. S. / Keeney, R. L. / Raiffa, H. (2006): The Hidden Traps on Decision Making. In: Harvard Business Review, 84 (2006), H. 1, S. 118-126.
31. Hastie, R. / Dawes, R. M. (2001): Rational Choice in an Uncertain World: the Psychology of Judgment and Decision Making, Thousand Oaks, Calif. et al. 2001.
32. Hodgkinson, G. P. / Jenkins, M. (2002): Managerial and Organizational Cognition. In: Bowman, M. / Jenkins, M. / Ambrosini, V. (Hrsg.): Strategic Management: A Multiple Perspectives Approach, Hampshire (2002), S. 177-204.
33. Hogarth, R. M. / Reder, M. W. (1986): Introduction: Perspectives from Economics and Psychology. In: Hogarth, R. M. / Reder, M. W. (Hrsg.): Rational Choice - The Contrast between Economics and Psychology, Chicago et al. (1986), S. 1-23.
34. Hogarth, R. M. (1991): A Perspective on Cognitive Research in Accounting. In: The Accounting Review, 66 (1991), H. 2, S. 277-290.
35. Jermias, J. (2001): Cognitive Dissonance and Resistance to Change: The Influence of Commitment Confirmation and Feedback on Judgement Usefulness of Accounting Systems. In: Accounting, Organizations and Society, 26 (2001), H. 2, S. 141-160.
36. Jungermann, H. / Pfister, H. / Fischer, K. (2005): Die Psychologie der Entscheidung: eine Einführung, 2. Aufl., Berlin 2005.
37. Kadous, K. / Sedor, L. M. (2004): The Efficiency of Third-Party Consultation in Preventing Managerial Escalation of Commitment: The Role of Mental Representations. In: Contemporary

Accounting Research, 21 (2004), H. 1, S. 55-82.

38. Kahneman, D. / Tversky, A. (1979): Prospect Theory: An Analysis of Decision Making under Risk. In: Econometrica, 47 (1979), H. 2, S. 263-291.
39. Kahneman, D. / Tversky, A. (2000): Choices, Values, and Frames. In: Connolly, T. / Arkes, H. R. / Hammond, K. R. (Hrsg.): Judgement and Decision Making - An Interdisciplinary Reader, Cambridge, UK, 2000, S. 147-165.
40. Kim, D. C. (1992): Risk Preference in Participative Budgeting. In: The Accounting Review, 67 (1992), H. 2, S. 303-318.
41. Klein, G. A. (1993): A Recognition-Primed Decision (RPD) Model of Rapid Decision Making. In: Klein, G. / Orasanu, J. / Calderwood, R. / Zsambok, C. (Hrsg.): Decision Making in Action: Models and Methods, Norwood, NJ 1993, S. 138-147.
42. Larrick, R. P. (2004): Debiasing. In: Koehler, D. J. / Harvey, N. (Hrsg.): Blackwell Handbook of Judgement and Decision Making, Malde, MA et al. 2004, S. 316-337.
43. Lewis, B. / Shields, M. D. / Young, M. S. (1983): Evaluating Human Judgements and Decision Aids. In: Journal of Accounting Research, 21 (1983), H. 1, S. 271-285.
44. Lingnau, V. (2001): Vom homo oeconomicus zum homo organisans - Zur Bedeutung von Herbert A. Simon für die Betriebswirtschaftslehre. In: Zeitschrift für Planung, 12 (2001), H. 4, S. 421-438.
45. Lingnau, V. (2004): Kognitionsorientiertes Controlling. In: Scherm, E. / Pietsch, G. (Hrsg.): Controlling - Theorien und Konzeptionen, München 2004, S. 729-749.
46. Lingnau, V. (2006): Controlling – Ein kognitionsorientierter Ansatz. In: Lingnau, V. (Hrsg.): Beiträge zur Controlling-Forschung, Nr. 4, 2. überarbeiteteAuflage, Kaiserslautern 2008.
47. Lingnau, V. (2008): Controlling - Controlling, BWL und Privatwirtschaftslehre. In: Lingnau, V. (Hrsg.): Beiträge zur Controlling-Forschung, Nr. 14, Kaiserslautern 2008.
48. Marchant, G. (1990): Accounting Changes and Information Processing: Some Further Empirical Evidence. In: Behavioral Research in Accounting, 2 (1990), H. 1, S. 93-103.
49. Matlin, M. W. (2005): Cognition, 6. Aufl., Hoboken, NJ 2005.
50. Medin, D. L. / Ross, B. H. / Markman, A. B. (2005): Cognitive Psychology, 4. Aufl., Hoboken, NJ 2005.
51. Mintzberg, H. / Raisinghani, D. / Theoret, A. (1976): The Structure of 'Unstructured' Decision Processes. In: Administrative Science Quarterly, 21 (1976), H. 2, S. 246-275.
52. Nerdinger, F. W. (2003): Grundlagen des Verhaltens in Organisationen, Stuttgart 2003.
53. Newell, A. / Simon, H. A. (1972): Human Problem Solving, Englewood Cliffs, NJ 1972.
54. Nisbett, R. E. / Krantz, D. H. / Jepson, C. / Kunda, Z. (1983): The Use of Statistical Heuristics in Everyday Inductive Reasoning. In: Psychological Review, 90 (1983), H. 4, S. 339-363.
55. Phillips, J. K. / Klein, G. / Sieck, W. R. (2004): Expertise in Judgement and Decision Making: A Case for Training Intuitive Decision Skills. In: Koehler, D. J. / Harvey, N. (Hrsg.): Blackwell Handbook of Judgement and Decision Making, Malde, MA et al. 2004, S. 297-315.
56. Plous, S. (1993): The Psychology of Judgement and Decision Making, New York et al. 1993.
57. Rose, J. / Wolfe, C. (2000): The Effects of System Design Alternatives on the Acquisition of Tax Knowledge from a Computerized Tax Decision Aid. In: Accounting, Organizations and Society,

25 (2000), H. 3, S. 285-306.

58. Schäfer, S. / Vater, H. (2002): Behavioral Finance: Eine Einführung. In: Finanz Betrieb, 4 (2002), H. 12, S. 739-748.
59. Selten, R. (1999): What is Bounded Rationality? In: Gigerenzer, G. / Selten, R. (Hrsg.): Bounded Rationality - The Adaptive Toolbox, Cambridge, Mass. 1999, S. 13-36.
60. Shanteau, J. (1989): Cognitive Heuristics and Biases in Behavioral Auditing: Review, Comments and Observations. In: Accounting, Organizations and Society, 14 (1989), H. 1/2, S. 165-177.
61. Sharp, D. J. / Salter, S. B. (1997): Project Escalation and Sunk Costs: A Test of the International Generalizability of Agency and Prospect Theories. In: Journal of International Business Studies, 28 (1997), H. 1, S. 101-121.
62. Shields, M. D. (1983): Effects of Information Supply and Demand on Judgement Accuracy: Evidence from Corporate Managers. In: The Accounting Review, 58 (1983), H. 2, S. 284-303.
63. Simon, H. A. (1955): A Behavioral Model of Rational Choice. In: The Quarterly Journal of Economics, 69 (1955), H. 1, S. 99-118.
64. Simon, H. A. (1957): Administrative Behavior: a Study of Decision-Making Processes in Administrative Organization, 2. Aufl., New York 1957.
65. Simon, H. A. (1986): Rationality in Psychology and Economics. In: Hogarth, R. M. / Reder, M. W. (Hrsg.): Rational Choice - The Contrast between Economics and Psychology, Chicago et al. (1986), S. 25-41.
66. Smith, J. F. / Kida, T. (1991): Heuristics and Biases: Expertise and Task Realism in Auditing. In: Psychological Bulletin, 109 (1991), H. 3, S. 472-489.
67. Sullivan, K. / Kida, T. (1995): The Effect of Multiple Reference Points and Prior Gains and Losses on Managers' Risky Decision Making. In: Organizational Behavior and Human Decision Processes, 1 (1995), H. 64, S. 76-83.
68. Uecker, W. C. (1978): A Behavioral Study of Information System Choice. In: Journal of Accounting Research, 16 (1978), H. 1, S. 169-189.
69. Wagner, R. K. (1991): Managerial Problem Solving. In: Sternberg, R. J. / Frensch, P. A. (Hrsg.): Hillsdale, NJ 1991, S. 159-183.
70. Waller, W. S. / Shapiro, B. / Sevcik, G. (1999): Do Cost-Based Pricing Biases Persist in Laboratory Markets? In: Accounting, Organizations and Society, 24 (1999), H. 8, S. 717-739.
71. Walsh, J. P. (1995): Managerial and Organizational Cognition: Notes from a Trip Down Memory Lane. In: Organization Science, 6 (1995), H. 3, S. 280-321.
72. Young, M. (1985): Participative Budgeting: The Effects of Risk Aversion and Asymmetric Information on Budgetary Slack. In: Journal of Accounting Research, 23 (1985), H. 3, S. 829-842.