



Cognitive benefits of scenario planning: Its impact on biases and decision quality



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ARTICLE INFO

Article history:

Received 29 November 2011

Received in revised form 10 September 2012

Accepted 22 September 2012

Available online 29 October 2012

Keywords:

Scenario planning

Cognitive benefits

Strategic decision making

Debiasing

Decision quality

ABSTRACT

In this paper, we examine cognitive benefits of scenario planning. Drawing on behavioral decision theory, we analyze the effect of scenario planning on the widely discussed framing bias in decision making as well as on decision quality. In an experiment involving 252 graduate management students, we find that scenario planning reduces the framing bias and that it has a more positive effect on decision quality than tools traditionally used in strategic planning. Thus, our paper contributes to the discussion analyzing the scenario method's benefits by providing additional support for its positive cognitive consequences as well as the method's aggregate effect on decision quality. It presents evidence that popular strategy tools like scenario planning, whose positive cognitive effects are widely claimed in the literature, may in fact alter biases and decision quality.

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1. Introduction

Scenario planning has received much attention from research since it was introduced by Royal Dutch Shell in the 1960s [1,2] and remains a commonly used tool in corporations around the world. In a recent study, over one-third of U.K. companies reported that they make use of scenario planning [3]. Similar results were also reported for U.S. and European companies [4–6].

A large body of literature on scenario planning has focused on the description and improvement of the scenario method itself. This research is mainly based upon practitioner reports and articles from the futures literature, which describe different approaches to develop scenarios [for an overview see: 7].

A smaller body of empirical research on scenario planning analyzes the method's benefits for corporate practice. This research suggests a positive influence of scenario planning on performance [8] as well as on the decision making process as a whole [9,10]. Particularly, the cognitive benefits of scenario planning in strategic decision situations have been widely claimed in the literature [11–13]. Among these positive cognitive effects are changes in mental models, which enhance the perception of environmental changes [1,2,9,14], and a reduction of the negative effects of cognitive biases [15].

Schoemaker [16] and Bradfield [17] were the first to empirically analyze the influence of the scenario method on cognitive biases. They found initial empirical support for the method's cognitive benefits by showing that scenario planning reduces the overconfidence bias as well as the confirmation bias [16,17]. It remains unclear, however, if scenario planning also reduces other cognitive biases and which process steps of the scenario method exactly cause its debiasing effect. In addition, previous research has not comprehensively analyzed if the positive cognitive effects of scenario planning also lead to a better outcome of the decision making process, i.e. to higher decision quality.

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In this paper, we address these questions and analyze the scenario method's effect on the framing bias, which is regarded as one of the most important biases in strategic decisions [18,19] as well as on decision quality as an outcome of the decision making process. Furthermore, we conduct an in-depth analysis of the cognitive effects of different steps of the scenario process by comparing the effects of a complete application with an application of only selected parts of the process. For this, we conduct experimental empirical research involving 252 graduate management students and analyze the difference between participants' strategic choices in four subgroups, who participated in special planning workshops.

Our results show that (a) scenario planning reduces the framing bias, (b) that a full application of the scenario process is necessary to achieve this positive cognitive effect and (c) that scenario planning has a positive effect on decision quality. In fact, we find that this effect is stronger compared to the application of tools that are traditionally used in strategic planning [20] such as SWOT analysis, Porter's [21] five forces analysis, and value chain analysis.

We contribute to the literature on the scenario method in three different ways. First, we provide additional empirical support for the cognitive benefits of scenario planning by showing that the debiasing effect of the scenario method not only includes the overconfidence and the confirmation bias [16,17] but also the framing bias. Secondly, we compare the different steps involved in the scenario process with regard to the reduction of biases and provide initial support for the claim that only a full application of the method may yield a debiasing effect. Finally, our study highlights the positive effect of scenario planning on the overall decision making process compared to traditional strategic planning tools.

2. Cognitive benefits of scenario planning

Scenario planning was pioneered in the 1960s by Royal Dutch Shell. The technique enabled the company to anticipate and better handle the oil shocks of the early 1970s, to which it could react earlier and more successfully than its competitors [1,2]. Still today, the method is widely used.

Scenario planning is a strategic planning tool for developing and thinking through possible future states and development paths [15]. The aim of scenario planning is not to accurately predict the future, but rather to better understand logical paths that lead to different scenarios and to develop more comprehensive strategies [1,2,15,21]. The scenario method is based on a multitude of different approaches for specific applications in corporate practice based on either a continuous or a single use of the scenario method [22]. Most prominently, scenario planning is used to foster sense making and adaptive learning [23], to develop more effective decisions and strategies [14] as well as to advance prediction in organizations [24].

Scenario planning has been cited frequently as a strategic planning tool capable to improve decision processes due to its cognitive benefits. Specifically, scenario planning has been shown to foster strategic thinking [25,26], to enhance mental models of decision makers [9,14] and to reduce the negative effect of cognitive biases [11,16,15].

Especially, its effect on cognitive biases is likely to induce significant benefits for the strategic decision making process as a whole as cognitive biases have been found to lead to severe and systematic errors that reduce decision quality [27–29]. A reduction of biases may therefore directly influence decision quality, which makes both elements key cognitive outcomes of the scenario method.

2.1. Cognitive biases and decision quality

Behavioral decision theory has identified cognitive biases as a particularly important phenomenon in planning and decision-making processes. Starting with Simon's [30] research on bounded rationality, a multitude of studies have identified a growing number of factors that systematically limit a manager's ability to make optimal decisions. Kahneman, Tversky, and colleagues later considerably refined this research stream [28,31,32]. Following more than 30 years of empirical research, the existence of cognitive biases is widely accepted by researchers not only in the strategic cognition field, but also in other strategy fields [32–34]. Cognitive biases are deviations from rationality in human thinking that result from specific heuristics used for information processing [32,35].

Cognitive biases occur particularly frequently in strategic planning and decision processes when decision makers are confronted with high environmental uncertainty [18]. In these situations research has shown that biases often lead to suboptimal decisions, which in turn have a negative effect on performance [27]. By comparing decision processes of 57 companies and their resulting financial performance, a recent study found that a lack of decision quality can decrease total shareholder return by nearly six percentage points [36].

Different types of cognitive biases have been observed in planning and strategic decision processes [for reviews, see 29,37–40]. Of particular importance in this context is the framing bias, which reduces the quality of decisions in a wide range of situations and which has been found to be especially relevant for strategic planning and decision making [18,19,41,42].

The framing bias or framing effect is a key component of prospect theory [43,44]. It describes a reversal of preferences depending on the way in which a decision problem is presented [18]. Most prominently, two types of framing biases have been distinguished in the literature. The first type describes situations, in which decision makers alter their preferences in evaluating choices when objects or events are framed in a positive or a negative way respectively. This so called attribute framing points to irrational differences in judgment depending on the framing of alternatives [45]. The second type is called risky choice framing. It describes changes in individual risk preferences. Here, decision makers are more risk averse when gains are highlighted and more risk seeking when losses are stressed. This phenomenon occurs when decision makers face discrete choices between risky and riskless options that are framed

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