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When We Are Happy, We Are the Same—Emotions as a Boundary Condition for the Impact of Cultural Differences on Strategic Decisions

Sophie Florian · Philip Meissner · Torsten Wulf · Xian Xu · Philip Yang

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Abstract Strategic decision-making research has mainly relied on the values-based approach to culture. However, the dynamic constructivist approach to culture has shown that cultural tendencies may also be altered by contingency factors in the decision-making process itself. We theorize based on the appraisal tendency framework as well as the concept of cultural affordances that emotions, such as happiness, can alter the cultural dispositions of managers from Western and East Asian contexts. To test our hypotheses, we conduct a lab-in-the-field experiment with 187 executives from China and Germany, and measure emotions based on participants' psychophysiological skin conductance responses. Our results show that happiness moderates and can even reverse initial cultural dispositions in executives' strategic decision-making behavior. These findings suggest that emotions may be important contingency factors that can alter the initial cultural dispositions of decision makers in the strategy process.

Keywords Emotions · Culture · Cultural differences · Strategic decision making

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1 Introduction

Cultural differences have received increasing research attention as drivers of strategic decision making (Bachmann et al. 2016) and strategic decision outcomes in organizations (Li et al. 2001). Research has shown, for example, that cultural differences affect decisions on corporate diversification (Savitz et al. 2016; Song et al. 2002), the decentralization and formalization of the strategic decision-making process (Dimitratos et al. 2011), and the interpretation of strategic issues (Barr and Glynn 2004).

The extant research on the impact of cultural differences on strategic decision making in organizations is almost exclusively centered on the values-based approach to culture, which differentiates cultures using Hofstede's (1980) value dimensions. However, this approach has been criticized in the extant literature (Tung and Verbeke 2010; Oyserman and Lee 2008; Shenkar 2001), because it tends to regard cultural dispositions as static, while research findings suggest that the effects of cultural differences might also be context-dependent (Chiu et al. 2000).

Psychological research on culture and decision making has introduced a dynamic constructivist approach to culture (Hong and Chiu 2001), which describes culture as a system of knowledge structures or folk theories (Peng and Knowles 2003; Ji 2005) that result from long-established cultural differences in social organization and social practices (Nisbett et al. 2001). Such differences manifest themselves in, for instance, different cognitive styles, which have been observed in East Asian and Western managers (Li et al. 2018; Varnum et al. 2010) and affect their strategic decision-making behavior (Tsui et al. 2007). The dynamic constructivist approach suggests that decision makers do not always display the behavioral tendencies associated with their cultural backgrounds. Rather, a specific behavioral effect of culture may change if the behavioral context changes (Chiu et al. 2000). Research has, for example, identified cognitive priming (Hong et al. 2000) and experience in two cultures (Morris and Fu 2001) as boundary conditions for changes in the behavioral effects of cultural differences.

Psychological research on culture and decision making indicates that emotions might also constitute a boundary condition that changes the effects of cultural differences on strategic decision making. Specifically, research on appraisal tendencies (Lerner and Keltner 2001) as well as on cultural affordances (Kitayama et al. 2006) suggests that happiness may serve as a contingency factor that changes cultural dispositions. While initial studies in Western cultural settings find that happiness can foster open information processing (Bramsfeld and Gasper 2008; Estrada et al. 1997; Isen et al. 1991; Staw and Barsade 1993), research in an Asian cultural context has shown that happiness leads to a reduction in holistic cognitive tendencies (Au et al. 2003). These findings indicate that emotions, such as happiness, might change the effects of cultural differences between Western and East Asian managers on their strategic decision-making behavior.

In this paper, based on the appraisal tendency framework as well as the concept of cultural affordances, we investigate the role of happiness as a moderator of cross-cultural differences in strategic decision-making behavior. Specifically, we suggest that happiness is an important contingency factor in the strategic decision-

making process, and that it can alter the initial cultural dispositions of decision makers from Western and East Asian countries. In line with prior research, we argue that managers from Western and East Asian cultures differ in their strategic decision-making behavior because of the different cognitive styles associated with their respective cultures (Li et al. 2018; Varnum et al. 2010). However, if induced with happiness, we hypothesize that the effect of culture on strategic decision making changes in opposite directions, such that the differences in strategic decision-making behavior between Western and Asian managers vanish. We argue that happiness induces different energizing effects in East Asian and Western managers. For East Asians, the energizing effect of happiness leads to more superficial processing and overconfidence (Au et al. 2003). Western managers, in contrast, are energized to dive more deeply into decision tasks, which triggers a broader and more thorough information search (Staw and Barsade 1993; Isen and Baron 1991). We test our hypotheses using a lab-in-the-field experiment (Koudstaal et al. 2016) involving 187 Chinese and German executives in four randomized groups. We measure emotions based on the psychophysiological skin conductance responses (SCR) of participants (Døjbak Håkonsson et al. 2016). The results of our empirical analysis support our hypotheses.

Our research contributes to the literature on strategic decision making in cross-cultural contexts. Specifically, we make two theoretical contributions. First, we expand our knowledge on the role of cross-cultural differences in strategic decision processes (Dimitratos et al. 2011) by introducing the dynamic constructivist approach to culture into strategic decision-making research. We show that the effects of cultural differences on strategic decision making are not static, but might change based on contingency factors. In addition, we introduce emotions, especially happiness, as a contingency factor that might serve as a boundary condition for the effect of culture on strategic decision making. Thus, we highlight that the effect of culture on strategic decision making is more complex than prior research might suggest.

Second, we contribute to research on the relationship between cognition and emotion by highlighting the role that intercultural differences might play in this relationship. Specifically, we show that the cognitive effects of emotions, such as happiness, differ for managers with different cultural backgrounds. Thus, our findings indicate that future research on the relationship between cognition and emotion should take cultural differences into account (Forgas and George 2001; George and Dane 2016).

2 Theoretical Background

2.1 Cultural Differences and Strategic Decision-making

The effects of cultural differences have been widely studied in the domains of international management (for a review, see López-Duarte et al. 2016), organizational behavior (for a review, see Tsui et al. 2007), and strategic management (e.g., Nielsen and Nielsen 2011; Song et al. 2002). Especially in the context of strategic decision making (i.e., decisions that are characterized by high levels of complexity, uncer-

tainty, and ambiguity; Schwenk 1995), cultural differences affect executives' choices (Dimitratos et al. 2011) and firm performance (Li et al. 2001).

Most research that analyzes the effect of cross-cultural differences on strategic decisions is rooted in the values-based approach to culture (Li et al. 2017). In other words, it distinguishes among national cultures based on Hofstede's (1980) value dimensions and compares strategic decisions among members of different cultural groups. This research has shown, for example, that firms in countries with higher levels of uncertainty avoidance, collectivism, and power distance tend to exhibit more corporate diversification (Savitz et al. 2016). Bachmann et al. (2016) find that certain cultural values—especially higher uncertainty avoidance and lower levels of individualism and masculinity, as assessed on the country level in nine countries—moderate the positive effect of strategic planning on the firm's entrepreneurial orientation. Dimitratos et al. (2011) analyze the impact of cultural values on the strategic decision-making process in firms from four countries and find a negative association between power distance and decentralization as well as positive relationships between individualism and lateral communication and between uncertainty avoidance and rule formalization in the strategic decision-making process. In a study of top managers from 20 countries, Geletkanycz (1997) shows that individualism, power distance, uncertainty avoidance, and long-term orientation are associated with openness to change. However, for two of the four cultural values, the relationship is the reverse of the anticipated direction. Barr and Glynn (2004) attribute differences in executives' strategic-issue interpretation to differences in uncertainty avoidance in their countries of origin. Specifically, they suggest that executives from countries characterized by high uncertainty avoidance tend to perceive strategic issues as less controllable. However, they do not find any effects for other cultural values.

Overall, research that analyzes the impact of national cultures on strategic decisions based on Hofstede's (1980) values-based approach has been criticized, as it cannot comprehensively explain the effects of cultural differences observed in the extant research (Tung and Verbeke 2010; Oyserman and Lee 2008; Shenkar 2001). In particular, the values-based approach assumes that culture is defined by fixed dispositions (i.e., static cultural values that hardly change over time; Beugelsdijk et al. 2015). However, inconclusive findings on the effects of cultural differences on strategic decisions suggest that such effects are—at least in part—context-dependent (i.e., when the strategic context changes, the impact of culture on a strategic decision might change; Chiu et al. 2000).

To account for these deficits in our extant knowledge, psychological research on culture and decision making has suggested a dynamic constructivist approach to culture (Hong and Chiu 2001). This approach describes culture as a loose network of knowledge structures and folk theories that result from long-established differences in social organization and social practices, and proposes that these structures mediate social behavior (Hong 2009). Cultural differences manifest themselves in, for example, the social norms, values, and cognitive styles that are shared among the members of a cultural group and guide their decision-making behavior (e.g., Yates and de Oliveira 2016). For instance, when making decisions, Westerners have been found to rely on a more analytical thinking style that is more object-focused and based on the assumptions that the world is stable and predictable (Ji et al. 2008;

Miyamoto et al. 2006). East Asians, in contrast, are more likely to apply a more holistic thinking style, rooted in the assumptions that contradictions can coexist and that change is a constant phenomenon (Ji 2005; Li et al. 2014).

Notably, the dynamic constructivist approach proposes that cultural dispositions do not always affect the behavior and decision making of members of a cultural group, and that these effects are not always of the same magnitude. In addition, it suggests that cultural norms, values, and cognitive styles are stored in the memory of the members of a cultural group, where they become available and accessible as part of an interconnected, associative cognitive network (Briley et al. 2014). Whether a member of a cultural group applies these norms, values, and cognitive styles in a specific situation depends on their perceived relevance to the focal task, i.e. the subjective assessment of their applicability in the specific context (Hong 2009). This implies that the effects of cultural norms, values, and cognitive styles on individual behavior in general and decision making in particular may surface, disappear, or even reverse if the behavioral context changes (Chiu et al. 2000).

Research has identified several boundary conditions that determine when certain cultural norms, values, and cognitive styles are activated and affect the behavior and decision making of members of a cultural group. Hong et al. (2000) show that activation can be achieved through cognitive priming based on culture-related stimuli, such as pictures of cultural symbols. In an experiment involving French and Korean consumers, Choi (2020) finds that (independent versus interdependent) self-construal priming reduces the cultural differences between members of these two cultural groups. Briley, Morris, and Simonson (2000) show that East Asian consumers are more willing to accept compromises when they are asked to provide reasons for their choices, while North American participants prefer compromises to a lesser extent when they are forced to provide such reasons. These authors argue that the need to justify a choice activates the more holistic cognitive style that is inherent in East Asian cultures, while in North Americans it brings the more analytical thinking style that characterizes Western cultures to the surface. While extant research adopting the dynamic constructivist approach to culture focuses on cognitive drivers of the activation of cultural norms, values, and cognitive styles, psychological research on culture and decision making suggests that emotions might also serve as a boundary condition for the impact of culture on individual behavior and decision making (Kitayama et al. 2006).

2.2 Emotions and Cultural Differences in Strategic Decision-making

Based on psychological foundations, researchers in the strategic decision-making field have started to explore the effect of emotions on strategic decisions (e.g., Døjbak Håkonsson et al. 2016; Hodgkinson and Healey 2011; Huy 2011). Emotions are defined as discrete, intense, and short-lived adaptive responses to environmental demands (Scherer and Ekman 1984; Elfenbein 2007). Initially, research on emotions in the strategic decision-making context has focused on valence-based conceptualizations of emotions, i.e. on positive vs. negative emotions. For example, Døjbak Håkonsson et al. (2016) have associated positive emotions with more explorative strategies, while Amabile et al. (2005) have found a positive effect of such emotions

on creativity in the workplace. Negative emotions, in contrast, have been linked to insensitive communication and problem avoidance (Maitlis and Ozcelik 2004).

Based in particular on the appraisal tendency framework (Lerner and Keltner 2001), more recent research in the strategic decision-making field has started to analyze the effects of discrete emotions, such as anger, fear, and happiness, on the strategic decision-making process (e.g., Meissner et al. 2021; Neumann and Wulf 2022). The appraisal tendency framework posits that discrete emotions trigger specific motivational and cognitive processes—so-called appraisal tendencies—that determine how that emotion impacts judgement and decision-making (Han et al. 2007). For example, happiness has been associated with appraisals of elevated certainty and individual control (Smith and Ellsworth 1985), which—in a Western context—has been linked to more optimistic assessments of risk (Lerner and Keltner 2001) and more heuristic information processing (Forgas 1998).

However, psychological research on culture and emotions indicates that the appraisal tendencies, that are associated with specific emotions, might differ across cultures due to specific cultural affordances (Kitayama and Marcus 1999). The concept of cultural affordances reflects folk theories, social practices, and schemas, that have been shared within a cultural group over generations (Kitayama et al. 2007) and that provide specific meanings to emotional experiences, thus triggering different appraisal tendencies for the same emotion across cultures (Kitayama et al. 2006). For example, individuals from East Asian cultures have been found to experience socially engaging emotions, such as pride, more strongly than Westerners, who experience disengaging emotions, such as anger, to a stronger extent (Kitayama et al. 2006). Matsumoto et al. (2008) find a particularly strong effect of cultural affordances for high-activation, positive emotions such as happiness.

These arguments are supported by findings in the strategic decision-making field, where research has shown that emotions affect cognition and thinking styles (Hodgkinson and Healey 2008, 2011), information processing (Seo and Barrett 2007; Staw and Barsade 1993), and the perception and interpretation of strategic issues (Mittal and Ross 1998). Neumann and Wulf (2022) report that emotions, such as fear and happiness, impact the strategic issue interpretation—as one element of the strategic decision-making process—of German and Chinese managers in different ways. They find that Chinese managers are affected in their interpretation of strategic issues by happiness as well as fear while German managers are only affected by fear. Overall, research in the strategic decision-making field indicates that emotions, such as happiness, might change the effects of cultural differences on the strategic decision-making behavior of Western and East Asian managers.

3 Hypotheses Development

3.1 Cultural Differences in Strategic Decision-making Between Chinese and German Executives

Psychological research on culture and decision making has highlighted differences in the decision-making behavior of East Asian and Western decision makers. For

example, Chinese executives have been found to exhibit a more holistic thinking style, which acknowledges the existence of contradictions and of change as a constant phenomenon (Ji 2005; Li et al. 2014), while German decision makers tend to adopt a more object- and stability-focused analytical cognitive style (Ji et al. 2008; Miyamoto et al. 2006).

Furthermore, Chinese decision makers process significantly more information and do so in a more integrated manner (Kühnen and Oyserman 2002; Oyserman and Lee 2008). At the same time, they tend to be less likely to ignore important pieces of information (Choi et al. 2003). On the other hand, Western decision makers typically rely on heuristics when processing information, which results in less attention to detail (Buchtel and Norenzayan 2008; Nisbett et al. 2001). Therefore, in decision-making processes, Western managers are more likely to selectively focus on important information, while more holistic, East Asian executives tend to engage in broader information processing (Li et al. 2015).

Consequently, Chinese executives consider a wider range of factors as relevant in decision situations (Li et al. 2016; Ng and Hynie 2014) and develop a broader set of alternative arguments when making strategic decisions (Kühnen and Oyserman 2002; Oyserman and Lee 2008). For this reason, East Asian decision makers tend to allocate resources more broadly than their Western counterparts (Li et al. 2018). Given the above arguments, we propose that when asked to choose among a number of strategic investment alternatives, Chinese executives will find positive and negative aspects in all options at hand, resulting in a more diversified allocation of strategic resources, while the opposite holds true for German decision makers. We therefore posit:

Hypothesis 1 In a neutral emotional state, Chinese decision makers (German decision makers) make more diversified (more focused) strategic investment decisions.

3.2 The Moderating Role of Happiness on Cultural Differences in Strategic Decision-making

Happiness is an emotion that is frequently experienced in the context of strategic decision making (Hermalin and Isen 2000). Psychological research on emotions and decision making indicates that specific emotions are associated with different appraisal tendencies (Lerner and Keltner 2001) and that these appraisal tendencies might change due to cultural affordances (Kitayama et al. 2006). Specifically, positive emotions, such as happiness, have been linked to changes in information processing in the context of strategic decisions (Staw and Barsade 1993). Initial findings from psychological studies in Western and East Asian contexts have highlighted how analytical (Western) and holistic (East Asian) thinking styles might change in a happy emotional state (Au et al. 2003; Matsumoto and Wilson 2008).

In a study in an East Asian context, rather than exhibiting holistic strategic decision-making behavior, participants in a happy emotional state engaged in more selective information processing, and adopted a more superficial and quick processing style than participants in a control group with a neutral emotional state (Au et al. 2003). Au et al. (2003) attribute this reversal of cultural disposition to the energizing

effect of happiness, which induces overconfidence as well as a higher propensity to simplify, to prematurely rely on heuristics, and to take risks (Schwarz and Clore 1983; Wyer et al. 1999).

Similarly, decision makers in a Western context have been shown to deviate from their cultural disposition when in a happy emotional state. In a study of diagnostic decisions in a Western cultural setting, Isen et al. (1991) find that happy decision makers processed a broader, more complex set of information than a control group. Staw and Barsade (1993) show that happy decision makers tend to more broadly support their judgments with data and achieve higher decision quality. These findings are attributed to the energizing effect of happiness that leads Western managers to dive more deeply into decision tasks, which triggers a broader, more thorough information search (Staw and Barsade 1993; Isen and Baron 1991). Similar results have been reported in group settings (Bramsfeld and Gasper 2008).

Based on these findings, we argue that happiness changes the strategic investment behavior of Chinese and German executives in different ways. Specifically, Chinese executives asked to choose among a number of strategic investment alternatives become more selective and focused, which results in more focused strategic investments. In contrast, German executives become likely to adopt a broader, more integrative approach to their information search, which results in greater diversification of their strategic investments. Overall, we predict that happiness—because of its opposite effects on information processing and risk-taking in different cultural contexts—moderates the relationship between culture and investment allocation in a such way that differences in decision-making behavior are reduced or even disappear. Hence, we posit:

Hypothesis 2a In a happy emotional state, Chinese decision makers make more focused strategic investment decisions than Chinese decision makers in a neutral emotional state.

Hypothesis 2b In a happy emotional state, German decision makers make more diversified strategic investment decisions than German decision makers in a neutral emotional state.

Hypothesis 2c Happiness moderates the effect of cultural differences between Chinese and German executives on their strategic investments, such that, in a happy state, the differences in strategic investments between German and Chinese decision makers diminish.

4 Method

4.1 Participants

To test our hypotheses, we conducted a lab-in-the-field experiment involving 97 Chinese and 90 German executives who were participants in executive programs at one Chinese and one German university, respectively. We selected Chinese and

Germans, as they have been shown to be representative of East Asian and Western cultures (Yates and de Oliveira 2016). Bicultural individuals were excluded from the experiments to avoid biased results, as they may exhibit divergent choice behaviors based on their two cultures (Mok and Morris 2010; Wang 2008). Overall, the sample consisted of executives between 22 and 65 years of age with 2 to 44 years of work experience. Of the executives, 59% held general management positions, 10% were top managers, and 31% occupied specialized management positions.

4.2 Experimental Design and Procedure

Design. In line with prior research in the fields of strategy (Croson et al. 2007) and management (Koudstaal et al. 2016), we conducted a lab-in-the-field experiment, which combines the advantages of field studies with the controlled setup of laboratory studies (Schwenk 1982). We used a post-test-only control group design in which we randomly assigned participants to either the treatment or the control condition. To avoid social desirability bias, we did not inform participants about the goal of the research prior to the experiment (Grimm 2010).

We conducted the experiment in person with an experimenter present for the duration of the study. At the beginning of the experiment, participants in the treatment group were asked to watch a movie clip intended to induce happiness. Movie clips are frequently used in emotion research (Bramsfeld and Gasper 2008; Fredrickson and Branigan 2005; Lerner and Keltner 2001) and seem particularly effective for inducing emotions (Lazar and Pearlman-Avnion 2014). The movie clip that we used to induce happiness showed a dance scene from the movie *500 Days of Summer*. Subjects in the neutral condition were presented with a neutral movie clip of a scene in which a sheet of paper is held out of a car window and is blowing in the wind. Both movie clips have been suggested by Schaefer et al. (2010). They include almost no dialogue, which helps prevent language priming and barriers (Lindquist et al. 2006). To further test the validity of this emotion-induction method, we conducted a pre-study in China and Germany, which confirmed that the videos were effective for eliciting a neutral emotional state (control group) and a happy emotional state (happy group), as intended.

The treatment group included 93 subjects (48 Chinese and 45 German), while 94 participants were randomly assigned to the control group (49 Chinese, 45 German). After watching the emotion-inducing movie clip, participants moved on to an in-basket exercise in which we tested their strategic investment decisions. All questions as well as the case study used in the experiment were translated from English into German and Chinese using a back-translation procedure. This method has frequently been applied in cross-cultural studies and has been shown to produce highly valid results (Brislin 1970; Lechuga and Wiebe 2011; van de Vijver & Leung 1997).

Procedure. We started our experiment with the same introduction for the treatment and control groups. After the introduction, all participants completed a short questionnaire that focused on the control variables used in the study. For our in-basket exercise, participants were then presented with a hypothetical business situation and asked to work through a series of documents, memos, and emails before making

a final decision (Kesselman et al. 1982). By providing participants with a number of informational items, in-basket tasks allow for the study of managers' abilities to handle complexity and ambiguity. Thus, in-basket tasks simulate the ill-structured problems that strategic decision makers face in their daily work (Woodside et al. 2016). Given their rich context, in-basket tasks are regarded as particularly well suited for studies of strategic decision making (Tse et al. 1988; Woodside et al. 2016). As such, they have frequently been utilized in research on decision making (Connelly et al. 2004; Estrada et al. 1997, 1994; Staw and Barsade 1993; Tse et al. 1988).

For our experiment, we used the in-basket case study "Adam & Smith Inc." (A&S) which was initially developed by Staw (1976) and later expanded by Tosi et al. (2003). The case first provides participants with a short description of the situation facing A&S, a large international manufacturing company that has been experiencing declining profits. In the second step, each participant is asked to act as the head of business development for A&S. He or she is presented with several memos and emails, and with financial information showing that the board of directors has identified a lack of research and development (R&D) efforts as one of the main reasons for the company's recent decline in profits. Finally, after reviewing all information, each participant is asked to decide how to allocate an additional R&D budget of USD 20 million among the company's three divisions. Participants are advised to make the allocation decision based on the projected absolute cumulative profitability per division. In this case, the Medical Industrial Products Division shows the highest projected cumulative profits (see Appendices A and B for further details).

5 Measures

Happiness. In line with the circumplex model, we used two separate dimensions—valence and arousal—to measure *happiness* (Russell 1980). Arousal describes the level of activation that is caused by an environmental stimulus which can range from low (calm) to high (excited), while valence captures the level of pleasantness of an environmental stimulus, ranging from negative to positive (Gomes et al. 2013). To assess valence, we used a questionnaire developed by Gross and Levenson (1995), which has frequently been applied in emotion research (Goldberg et al. 1999; Han et al. 2012; Lerner et al. 2013). The questionnaire asks subjects to rate their current feelings along 16 different emotional states. We assessed happiness as a composite measure of the items "happy" and "joyful" (Mayer et al. 1992).

To measure arousal, we gathered data on subjects' skin conductance responses (SCR) (Crone et al. 2004; Døjbak Håkonsson et al. 2016; Van 't et al. 2006). This is a valid psychophysiological measure, given that emotions are frequently felt outside of conscious awareness (Dawson et al. 2011; Figner and Murphy 2011). To measure arousal, we asked participants to wear wristbands with built-in electrodes during the experiment. The collected data were analyzed using Ledalab, a Matlab-based application. Following the process suggested by Benedek and Kaernbach (2010) we derived the SCR score as the average phasic driver activity after the start of the simulation. To generate this value, we continuously measured participants' skin

conductance response during the experiment. We then used a continuous decomposition analysis (CDA) and a sampling frequency of 4 Hz to decompose SCR data into continuous tonic and phasic driver activity. The phasic driver activity reflects the sudomotor nerve (SN) activity, which serves as an indicator of emotional arousal. Specifically, the CDA provides SCR amplitude values for each participant during the experiment. The average of these SCR amplitude values serves as the participant's SCR score (Benedek and Kaernbach 2010). For 35 of the 187 subjects, the wristbands did not record any data, as they were moved or accidentally turned off during the experiment. As a result, we obtained valid SCR values from 152 subjects.

Strategic investment decision. In line with Staw (1976) and Tosi et al. (2003), we measured *strategic investment decision* based on participants' allocations of the USD 20 million R&D budget during the in-basket exercise. We evaluated the extent to which their strategic investment decisions were diversified or focused along two dimensions. As a first measure, we analyzed the amount invested in R&D for the division with the highest cumulative projected profitability for the years 2018 to 2020 (i.e., the Medical Industrial Products Division; see Appendices A and B). To compare groups, we calculated the mean R&D investment in this division in each group. A lower amount indicates a more diversified strategic investment decision, while a higher amount signals a more focused strategic investment decision.

As a second measure of focused or diversified strategic investment decisions, we followed Li et al. (2018) and assessed the mean distribution of investments across all possible alternatives. In line with Payne (1976), we calculated the standard deviation (SD) of the investment allocation for each individual participant. To compare groups, we calculated the mean standard deviation for each group (i.e., happy and neutral Germans, and happy and neutral Chinese). For example, a value of 6 indicates that the subjects' investments across alternatives in this particular group differ from the mean by an average of USD 6 million. A high mean SD indicates a high concentration of investments on one alternative—that is, a focused strategic investment decision (i.e., subjects invest very different amounts of money in the three alternatives, thus clearly choosing one), while a low mean SD signals a rather equal distribution of investments across alternatives—that is, a more diversified strategic investment decision (i.e., subjects invest about the same amount of money in each alternative, thus not clearly choosing one).

Control variables for randomization. We included *age* as a demographic variable for our randomization check, as it has been shown to influence strategic decision making (Wiersema and Bantel 1992) and to affect subjects' dialecticism (Ng and Hynie 2014). *Gender* was included, as it has been found to influence emotions (Crawford et al. 1992). In line with Jago and Vroom (1977), we asked participants to indicate their *hierarchical level* in their organization, as this might influence their familiarity with strategic decisions (Olson et al. 2007, 2016; Pavett and Lau 1983). *Work tenure* has been shown to influence risk-taking propensity in strategic decisions (Simsek 2007) and is frequently included in studies using in-basket decision-making tasks (Staw and Barsade 1993). We measured work tenure as the number of years that subjects had been working after finishing their academic education. In line with Bantel and Jackson (1989), we included the highest *academic degree* as a demographic variable in our manipulation checks, as it is frequently used in

research on executives (Daellenbach et al. 1999; Datta and Guthrie 1994). Finally, to test for differences in information processing between the Chinese and German participants, we assessed subjects' *holistic tendency* based on a 10-item questionnaire developed by Choi et al. (2003) using a 7-point Likert scale. Holistic tendency has been shown to shape cultural differences in information processing (Choi et al.

Table 1 Descriptive statistics for German and Chinese executives

Variable	<i>n</i>	Mean	SD	Min	Max
<i>Age</i>					
Chinese	97	34.94	9.33	22.00	59.00
German	90	37.14	10.61	25.00	65.00
<i>Gender</i>					
Chinese	97	1.35	0.48	1.00	2.00
German	90	1.22	0.42	1.00	2.00
<i>Hierarchy</i>					
Chinese	97	2.23	0.91	1.00	4.00
German	90	2.08	1.10	1.00	4.00
<i>Work Tenure</i>					
Chinese	97	9.64	8.00	2.00	34.00
German	87 ^a	13.14	12.71	2.00	44.00
<i>Degree</i>					
Chinese	97	1.82	0.38	1.00	2.00
German	90	1.74	0.44	1.00	2.00

Degree with 1 =< bachelors degree; 2 => bachelors degree

^a3 missing entries

Table 2 Descriptive statistics for happy and neutral executives

Variable	<i>n</i>	Mean	SD	Min	Max
<i>Age</i>					
Happy	93	35.88	9.87	22.00	65.00
Neutral	94	36.12	10.17	23.00	63.00
<i>Gender</i>					
Happy	93	1.30	0.46	1.00	2.00
Neutral	94	1.22	0.45	1.00	2.00
<i>Hierarchy</i>					
Happy	93	2.15	0.96	1.00	4.00
Neutral	94	2.16	1.01	1.00	4.00
<i>Work Tenure</i>					
Happy	91 ^a	10.99	10.44	2.00	44.00
Neutral	93 ^b	11.59	10.80	2.00	43.00
<i>Degree</i>					
Happy	93	1.82	0.39	1.00	2.00
Neutral	94	1.76	0.43	1.00	2.00

Degree with 1 =< bachelors degree; 2 => bachelors degree

^a2 missing entries

^b1 missing entry

2003), which made it highly relevant in the context of our study. The Cronbach's alpha was 0.689.

6 Results

6.1 Randomization Checks

To test whether our experimental groups were successfully randomized, we compared our subgroups with regard to participants' age, gender, hierarchy, work tenure, and academic degree. Neither the comparison of the German group with the Chinese group nor the comparison of the happy group with the neutral group revealed any differences in these variables, suggesting successful randomization (Tables 1 and 2).

To ensure that our Chinese and German subgroups displayed information-processing differences, we analyzed both groups' holistic tendencies (Nisbett et al. 2001). An analysis of variance (ANOVA) with culture as the between-subjects factor supports our arguments and is in line with prior research in the field. We found a significant difference between Chinese and German managers ($F=6.386$; $p=0.013$) with a medium effect size ($d=0.53$; $r=0.26$) (Cohen 1988), with the Chinese participants ($\bar{x}=5.59$) being more holistic than the German participants ($\bar{x}=5.15$) (See Fig. 1).

6.2 Manipulation Checks

To ensure that we successfully induced happiness in our treatment group, we conducted manipulation checks for our self-reported measure of valence and the SCR measure of arousal. For valence, we found significantly higher values for happiness (German: $F=33.459$; $p<0.0005$; Chinese: $F=100.490$; $p<0.0005$) in both the German (happy: $\bar{x}=4.87$; neutral: $\bar{x}=3.03$) and the Chinese groups (happy: $\bar{x}=6.07$; neutral: $\bar{x}=2.36$). In line with prior research that has used movie clips to induce emotions (Bramesfeld and Gasper 2008), we observed very large effect sizes in both groups (Germans: $d=1.23$; Chinese: $d=2.06$) (Cohen 2008).

Fig. 1 Cross-cultural differences in holistic tendencies

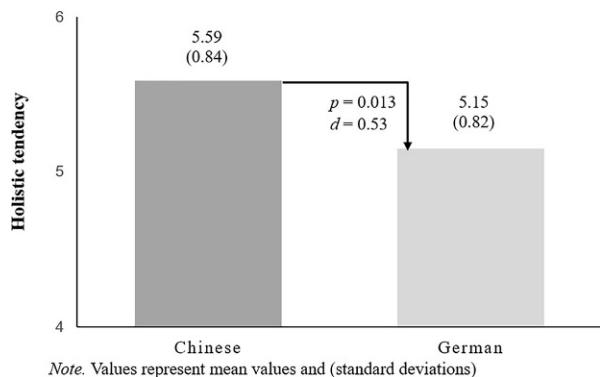


Table 3 ANOVA results for sum of R&D investment for executives in the neutral condition

Group	<i>n</i>	Mean	SD	ANOVA results		<i>p</i> -value
Chinese	49	9.56	4.95	F—Welch	34.801***	<0.0005
German	45	15.98	5.54	R ²	0.276	
				Adj. R ²	0.269	

For the SCR, we found significant differences ($F=6.073$; $p=0.015$) between the happy ($\bar{x}=0.15$) and the neutral groups ($\bar{x}=0.10$) in our study. The effect size was small ($d=0.40$; $r=0.20$) (Cohen 1988). Moreover, among the Chinese participants, differences between the happy ($\bar{x}=0.18$) and the neutral ($\bar{x}=0.12$) group were significant ($F=4.027$; $p=0.048$) with a small effect size (Chinese: $d=0.45$; $r=0.22$) (Cohen 1988). For the German group, we observed higher values of arousal in the happy group ($\bar{x}=0.12$) than in the neutral group ($\bar{x}=0.07$) but these differences were not statistically significant ($F_{Welch}=3.221$; $p=0.077$). Overall, however, we conclude that happiness was successfully manipulated in the experiment.

6.3 Hypotheses Tests

To test Hypothesis 1, which suggests that Chinese decision makers diversify their strategic investments more than German executives, we compared both the amount invested in the division with the highest cumulative projected profitability (i.e., the Medical Industrial Products Division) and the standard deviation (SD) of investments across all alternatives. We ran two separate ANOVAs with culture as the between-subjects factor for the 94 participants in our control groups (Lechuga and Wiebe 2011; Li et al. 2016). Tables 3 and 4 show the respective results.

For R&D investments in the division with the highest cumulative projected profitability, we find a significant difference between German and Chinese managers ($F_{Welch}=34.801$, $p=<0.0005$), with Germans making more investments in the division ($\bar{x}=15.98$) than Chinese participants ($\bar{x}=9.56$). In line with Hypothesis 1, this indicates that Chinese executives seek more diversified strategic investments. The effect size is large ($d=1.23$; $r=0.53$) (Cohen 1988) (Table 3). For our second measure of strategic investment, the SD of investments across all alternatives, we also find significant differences between the groups ($F=27.445$; $p=<0.0005$). More specifically, Chinese executives distributed their investments more ($\bar{x}=3.40$) than German executives ($\bar{x}=6.90$). The effect size is again large ($d=1.08$; $r=0.48$) (Table 4). Thus, both analyses offer support for Hypothesis 1.

Hypotheses 2a predicts that the strategic investment decisions of Chinese executives become more focused when the managers are in a happy emotional state.

Table 4 ANOVA results for SD of investments for executives in the neutral condition

Group	<i>n</i>	Mean	SD	ANOVA results		<i>p</i> -value
Chinese	49	3.40	2.96	F—Welch	27.445***	<0.0005
German	45	6.90	3.47	R ²	0.232	
				Adj. R ²	0.224	

Table 5 ANOVA results for sum of R&D investment of Chinese executives in a happy versus a neutral condition

Group	<i>n</i>	Mean	SD	ANOVA results		<i>p</i> -value
Happy	48	11.79	5.12	F	4.756 *	0.032
Neutral	49	9.56	4.95	R ²	0.048	
				Adj. R ²	0.038	

To test this hypothesis, we ran ANOVAs with emotion as the between-subjects factor for the Chinese subgroups (i.e., neutral versus happy). For R&D investments in the division with the highest cumulative projected profitability as the dependent variable, the results show that the happy group invested significantly more in this alternative ($\bar{x}=11.79$) than the neutral group ($\bar{x}=9.56$) ($F=4.756$; $p=0.032$). In this case, the effect size is small ($d=0.45$; $r=0.22$) (Cohen 1988). The results are shown in Table 5. For our second measure of strategic investment, the SD of investments across all alternatives, the results point in the proposed direction, with happy Chinese executives making more focused strategic investments ($\bar{x}=4.34$) than managers in the neutral group ($\bar{x}=3.40$). However, this difference is not significant ($F=2.32$; $p=0.131$). Thus, our results offer partial support for Hypotheses 2a.

Hypothesis 2b predicts that the strategic investment decisions of German executives become more diversified when those executives are in a happy emotional state. To test this hypothesis, we ran ANOVAs with emotion as the between-subjects factor for the German (neutral versus happy) subgroups. For R&D investments in the division with the highest cumulative projected profitability as the dependent variable, the results show that the happy group ($\bar{x}=13.33$) invested significantly less in this alternative than the neutral group ($\bar{x}=15.98$) ($F=4.334$; $p=0.040$). The effect size is small ($d=0.44$; $r=0.22$) (Cohen 1988). The results are shown in Table 6. For our second measure of strategic investment, the SD of investments across all alternatives, the results point in the proposed direction, with happy German executives making more diverse strategic investments ($\bar{x}=5.67$) than German managers in the neutral group ($\bar{x}=6.90$). However, the differences is not significant ($F=2.64$; $p=0.108$). Thus, our results offer partial support for Hypotheses 2b.

Hypothesis 2c predicts that happiness moderates the relationship between culture and strategic investments, such that cultural differences between the Chinese and German groups diminish in a happy emotional state. To test this hypothesis, we followed prior research examining the interaction of culture and emotion (Hunsinger et al. 2012; Mok and Morris 2010) and used a 2×2 factorial design with

Table 6 ANOVA results for sum of R&D investment of German executives in a happy versus a neutral condition

Group	<i>n</i>	Mean	SD	ANOVA results		<i>p</i> -value
Happy	45	13.33	6.47	F	4.334 *	0.04
Neutral	45	15.98	5.54	R ²	0.047	
				Adj. R ²	0.036	

Table 7 ANOVA results for the interaction between culture (German versus Chinese managers) and emotion (neutral versus happy emotional state) on the sum of R&D investments

	<i>n</i>	ANOVA results		<i>p</i> -value
Emotion	187	F	0.065 n. s.	0.799
Culture	187	F	24.136***	<0.0005
Culture × Emotion	187	F	9.056**	0.003
Emotion		R ²	0.154	
		Adj. R ²	0.140	

Table 8 ANOVA results for the interaction between culture (German vs. Chinese managers) and emotion (neutral vs. happy emotional state) on SD of investment

Variable	<i>n</i>	ANOVA results		<i>p</i> -value
Emotion	187	F	0.088 n. s.	0.767
Culture	187	F	24.73***	<0.0005
Culture × Emotion	187	F	5.002*	0.027
		R ²	0.140	
		Adj. R ²	0.126	

culture (German versus Chinese) and emotion (happy versus neutral) as factors, and both R&D investments in the Medical Industrial Products Division and the SD of investment as dependent variables. For R&D investments in the Medical Industrial Products Division, the analysis reveals a significant main effect of culture ($F = 24.136$; $p < 0.0005$) with a medium effect size ($d = 0.72$; $r = 0.34$) (Cohen 1988), but no main effect of emotion ($F = 0.065$; $p = 0.799$). At the same time, the analysis points to a significant interaction effect of culture and emotion ($F = 9.056$, $p = 0.003$) (Table 7). We obtain similar results for the SD of investments, our second measure of strategic investment. Culture has a highly significant main effect ($F = 24.730$; $p < 0.0005$) with a medium effect size ($d = 0.73$; $r = 0.35$) (Cohen 1988), while no significant main effect of emotion occurs ($F = 0.088$; $p = 0.767$). Again, the analysis

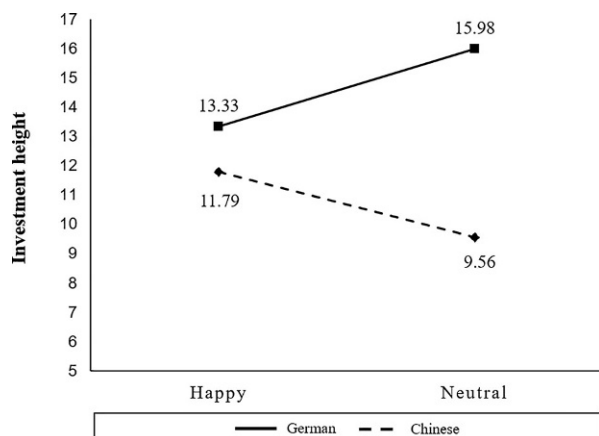
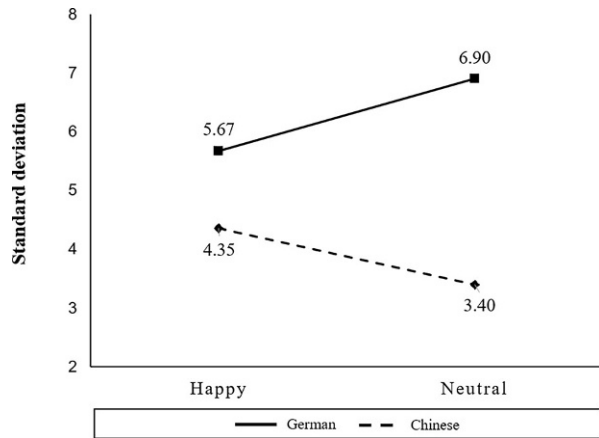
Fig. 2 Interaction effect between emotion and culture on sum of R&D investment

Fig. 3 Interaction effect between emotion and culture on SD of investment

shows a significant interaction effect of culture and emotion ($F=5.002$; $p=0.027$) (Table 8). These results offer support for Hypothesis 2c.

We also plotted the interactions for both the invested amount and the SD of investments. These plots are depicted in Figs. 2 and 3.

To further support the robustness of our findings, we used ANOVAs to analyze whether cultural differences disappear between the subgroups of happy Germans and happy Chinese. For R&D investments in the division with the highest projected absolute cumulative profitability, we find no significant difference between the German ($\bar{x}=13.33$; $SD=6.47$) and Chinese subgroups ($\bar{x}=11.79$; $SD=5.12$) ($F_{Welch}=1.609$; $p=0.208$). Similarly, when analyzing the mean SD of investments, no significant difference ($F=3.470$; $p=0.066$) emerges between the German ($\bar{x}=5.67$; $SD=3.70$) and Chinese subgroups ($\bar{x}=4.35$; $SD=3.13$). These results, which are shown in Tables 9 and 10, offer further support for Hypothesis 2c.

Table 9 ANOVA results for sum of R&D investment for all executives in the happy condition

Group	<i>n</i>	Mean	SD	ANOVA results		<i>p</i> -value
Chinese	48	11.79	5.12	F—Welch	1.609 n. s.	0.208
German	45	13.33	6.47	r^2	0.018	
—	—	—	—	Adj. R^2	0.007	—

Table 10 ANOVA results for SD of investment for all executives in the happy condition

Group	<i>n</i>	Mean	SD	ANOVA results		<i>p</i> -value
Chinese	48	4.35	3.13	F—Welch	3.47 n. s.	0.066
German	45	5.67	3.7	r^2	0.037	
				Adj. R^2	0.027	

7 Discussion

Cultural differences exert important effects on strategic decision making (Dimitratos et al. 2011) and organizational performance (Li et al. 2001). While the extant research on the impact of culture in strategic decision making is mostly grounded in the values-based approach to culture (Hofstede 1980) and regards cultural dispositions as static, psychological research has applied a dynamic constructivist approach. This approach suggests that the cultural tendencies of decision makers may be altered by contingency factors in the decision process. We argue that emotions constitute an important boundary condition, as they have been shown to alter cultural predispositions in both Western (Bramsfeld and Gasper 2008; Staw and Barsade 1993) and Asian contexts (Au et al. 2003). Empirically, we find that although German and Chinese executives differ significantly in their strategic investment behavior because of their cultural dispositions, happiness serves as a boundary condition that reverses cultural dispositions (Choi et al. 2003).

As such, our findings make two theoretical contributions to the strategic decision-making literature in particular and strategic management research in general. First, we contribute to strategic decision-making research by introducing the dynamic constructivist approach to culture and by identifying emotions, specifically happiness, as a boundary condition for the effects of cultural differences on strategic decision making. Thus, we provide support for the notion that culture is a dynamic, rather than a static, driver of strategic decision making (Ronen and Shenkar 2013). Future research should focus on asking *when* and not just *how* cultural differences matter. In addition, our study provides further evidence of the suggested interdependence between emotion and cognition in an intercultural context (Forgas and George 2001; Kim 2012). By examining the simultaneous effects of culture and emotion, we are able to provide an explanation for Au et al. (2003) findings, which contradict those of research conducted with Western subjects (Bramsfeld and Gasper 2008; Estrada et al. 1997; Isen et al. 1991; Staw and Barsade 1993). Additionally, we add to findings by Neumann and Wulf (2022) and show that emotions serve as a boundary condition for the effect of cultural differences beyond the mere interpretation of strategic issues. Rather, our study highlights that emotion might take on this role throughout the strategic decision-making process. Overall, our findings show that a more differentiated understanding of cognitive processes in the strategic decision-making process can be gained by examining contingency factors, such as emotions. This might also contribute to a better understanding of other cognitive processes involved in decision making (e.g., attribution, creativity, or memory) (Lerner et al. 2015).

The second contribution of our research goes beyond research on strategic decision making. By identifying happiness as a moderator of cultural dispositions, we support other researchers' calls for more research on emotional and cognitive processes in strategy management research (Burgelman et al. 2018). By integrating social and cognitive psychology research into strategic management research, we demonstrate the additional explanatory power offered by research within the field of behavioral strategy (Huang 2009; Pettigrew et al. 2001). In particular, our findings highlight the need for a shift in the discussion from examining which cultural

differences exist towards examining the conditions under which they change. This shift will extend the focus of strategic management research from regarding culture as a fixed cross-cultural construct and might inform research on, for instance, the influence of cultural diversity on strategic decision outcomes (Nielsen and Nielsen 2013) or research on the consequences of cultural distance between headquarters and foreign subsidiaries (Plourde et al. 2014). It may also enhance research on the role of cultural differences in other strategic processes, such as opportunity identification (Shepherd et al. 2017).

Beyond these theoretical contributions, our study makes several empirical contributions to strategic decision-making research. Building on research in the fields of cognitive and social psychology, our study offers one of the first examinations of the effect of emotion on strategic decision-making behavior in a previously largely ignored cultural group: the Chinese (Ashkanasy and Dorris 2017). Furthermore, our study is the first to consider the simultaneous effects of emotion and culture on decision making. Finally, by conducting an in-basket strategic decision-making experiment, our study extends research on emotion in the strategic management literature by examining actual individual decision-making behavior rather than decision-making outcomes (Choi et al. 2011; Døjbak Håkonsson et al. 2016; Huy 2011) or conceptual contributions in the field (Hodgkinson and Healey 2011; Sanchez-Burks and Huy 2009).

Finally, our study has some important practical implications. Specifically, organizations and top managers should be careful to take the effects of emotions, such as happiness, into account when making strategic decisions. While we make no inferences about the impact of emotions on the quality of strategic decision making, organizations should make their decision-makers aware of both cultural and emotional influences during decision making. As emotions represent an integral part of daily work (Ashkanasy and Dorris 2017), learning how to handle them and becoming aware of their effects, especially in a multinational context, might be important for both the quality and process of decision making as well as subsequent organizational performance (Seo and Barrett 2007). Furthermore, in managing intercultural interactions (e.g., between headquarters and subsidiaries, or among members of internationally diversified top management teams), an awareness of the moderating influence of emotion on cultural differences might even reduce conflict and discussions around decision making. Thus, being happy together might also make us better able to work together.

8 Limitations and Future Research

All research has its limitations. As such, this study suffers from several limitations that offer opportunities for future research. First, we only examined the influences of emotion on Germans and Chinese as representatives of individualistic and collectivistic cultures, respectively. Thus, future research might enhance our findings by examining their generalizability to other cultural groups. Such research could, for example, examine Japanese and Americans in order to include two more frequently examined cultural groups (Yates and de Oliveira 2016).

Second, as we used Staw's (1976) Adam & Smith case, we exposed subjects to a specific strategic situation. Although in-basket exercises provide a high degree of realism and have been shown to be good predictors of managerial behavior (Woodside et al. 2016), whether the moderating effect of happiness on cross-cultural differences can be extended to other strategic decisions (e.g., market-entry situations) is a question for future research. For instance, researchers could use business simulations or vignette decision experiments to increase the generalizability of our findings beyond the specific strategy context and the methodology used here.

Third, in our study we followed the dynamic constructivist approach to culture (Hong and Chiu 2001) which regards the social norms, values, and cognitive styles, that are shared among the members of a cultural group, as drivers of differences in their decision-making behavior (e.g., Yates and de Oliveira 2016). While this approach is well-established in psychological research, it neither accounts for within-culture variation, which might result from differences in educational systems, politics, or religious beliefs within East Asian or Western cultures, nor for variations that are caused by an interplay of national and organizational cultures (i.e., an East Asian individual working for a Western company). Thus, future research might benefit from a more fine-grained analysis of the drivers of social norms, values, and cognitive styles that are characteristic of a cultural group as well as from testing the effects of organizational compared to national cultures on strategic decision making.

Finally, our research only addressed the effect of one specific emotion on cultural differences in strategic decision making—namely of happiness. While happiness is an important emotion in the context of strategic decision making (Hermalin and Isen 2000), future research should also examine the contingency effects of other distinct emotional states. A great deal of research has, for example, been conducted on the influence of anger and fear (Lerner and Tiedens 2006; Tiedens and Linton 2001). Additionally, such research might look beyond the effects of individual decision making to analyze how emotions alter cultural dispositions in strategy discussions and the subsequent decision outcomes of a group (Liu and Maitlis 2014).

9 Conclusion

Culture plays an important role in strategic management research given cross-cultural differences in strategic orientation and decision making. Based on the dynamic constructivist approach to culture, this study examines not only *how* but also *when* these differences matter. Our results suggest that emotion, especially happiness, is a significant moderator of cultural tendencies in strategic decision-making behavior. Specifically, we find that while the Germans and the Chinese differ significantly in their decision-making behavior in a neutral state, these differences vanish in a happy state. Overall, the findings of this paper significantly contribute to research on strategic decision making in particular and strategic management in general, and have important practical implications for companies operating in an international environment.

10 Appendix A

10.1 Exemplary In-basket Items

Memorandum of the 3rd Board of Directors Meeting

Date: 20th July 2016

Recipient list: All members of the board of directors and executive committee

Purpose of this document: To inform about the meeting's content and main decisions taken

Content of Discussion: The entire 3rd board of directors meeting this year was dedicated to the review of our company's financial development over the past years and its current market position. A comprehensive set of information including financial reports of each division over the past ten years as well as an analysis of market trends and the company's current positioning in the market was distributed to all board members ahead of the meeting. Main points from the discussion of these data can be summarized as:

- **A&S profitability has continued to decline**, a trend that has been observed over several preceding years and that represents a major concern for the board and shareholders of the company. Not only does this result in a decline in corporate earnings, but it also causes a deterioration of competitive advantage
- **Thus, although A&S is still profitable overall, the board has decided that it is necessary to take action to reverse the downward trend**
- **One of the main causes leading to the decline in profitability that was identified during the meeting is a lack of investment in research & development.** This lack of investment seems to have been hindering and halting the development of the company

Decisions taken during the meeting and subsequent action to be taken by indicated members of the board or executive committee:

- **The board has decided to invest a dedicated R&D budget of approximately 20 million over the next year**
- **Chief financial officer** to review all budgeting and financing decisions and to **confirm the final amount of R&D budget** that can be invested. Furthermore, he is to calculate financial projections of the development of each division over the next three years
- **Chief business development officer** to decide on how to allocate the budget. The total amount may be invested in only one division or split among two or all three divisions. The board leaves this decision up to the chief business development officer. **The allocation decision is to be made, however, based on the potential future earnings, thus the profitability of the division(s)** as projected for the next three years. Only the division or divisions with the highest projected profitability over the next three years should receive the investment

**Figure 1. Adam & Smith Inc., Consumer Products Division
Forecasted Income Statement 2017–2020**

(in millions)	2017	F 2018	F 2019	F 2020
Net Sales	1,700,0 €	1,750,0 €	1,730,0 €	1,750,0 €
Cost of Goods Sold	765,0 €	822,5 €	787,2 €	806,8 €
Gross Profit	935,0 €	927,5 €	942,9 €	943,3 €
Selling, General and Administrative	613,7 €	647,5 €	622,8 €	638,8 €
Income from Operations	321,3 €	280,0 €	320,0 €	304,5 €
Interest and Other Income	17,0 €	26,3 €	39,8 €	15,8 €
Interest Expense	51,0 €	38,5 €	70,9 €	61,3 €
Income Before Income Taxes	287,3 €	267,8 €	288,9 €	259,0 €
Taxes				
Income Tax Provision	119,0 €	105,0 €	121,1 €	87,5 €
Net Profit	168,3 €	162,8 €	167,8 €	171,5 €

**Figure 2. Adam & Smith Inc., Medical Industrial Products Division
Forecasted Income Statement 2017–2020**

(in millions)	2017	F 2018	F 2019	F 2020
Net Sales	1,660,0 €	1,640,0 €	1,750,0 €	1,800,0 €
Cost of Goods Sold	927,9 €	913,5 €	973,0 €	999,0 €
Gross Profit	732,1 €	726,5 €	777,0 €	801,0 €
Selling, General and Administrative	464,8 €	454,3 €	476,0 €	490,5 €
Income from Operations	267,3 €	272,2 €	301,0 €	310,5 €
Interest and Other Income	33,2 €	19,7 €	31,5 €	34,2 €
Interest Expense	58,1 €	49,2 €	52,5 €	63,0 €
Income Before Income Taxes	242,4 €	242,7 €	280,0 €	281,7 €
Income Tax Provision	83,0 €	82,0 €	106,8 €	102,6 €
Net Profit	159,4 €	160,7 €	173,2 €	179,1 €

**Figure 3. Adam & Smith Inc., General Industrial Products Division
Forecasted Income Statement 2017–2019**

(in millions)	2017	F 2018	F 2019	F 2020
Net Sales	1,700,0 €	1,890,0 €	1,920,0 €	1,940,0 €
Cost of Goods Sold	986,0 €	1,096,2 €	1,152,0 €	1,144,6 €
Gross Profit	714,0 €	793,8 €	768,0 €	795,4 €
Selling, General and Administrative	459,0 €	500,9 €	528,0 €	533,5 €
Income from Operations	255,0 €	293,0 €	240,0 €	261,9 €
Interest and Other Income	51,0 €	37,8 €	57,6 €	29,1 €
Interest Expense	59,5 €	75,6 €	57,6 €	71,8 €
Income Before Income Taxes	246,5 €	255,2 €	240,0 €	219,2 €
Income Tax Provision	85,0 €	85,1 €	76,8 €	44,6 €
Net Profit	161,5 €	170,1 €	163,2 €	174,6 €

11 Appendix B

11.1 Decision-making Task

Please use the boxes below to allocate the indicated R&D budget of USD 20 million among the divisions. As the memorandum from the board meeting indicated, your decision should be based on the projected cumulative absolute profitability per division that can be reached with the investment until 2020. The entire amount may be allocated to one division, or split among two or all divisions. Please enter the amount in millions.

Consumer Products Division

m

Medical Industrial Products Division

m

General Industrial Products Division

m

Conflict of interest S. Florian, P. Meissner, T. Wulf, X. Xu and P. Yang declare that they have no competing interests.

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