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RELEVANT AND QUASI-RELEVANT MANAGEMENT ACCOUNTING INFORMATION

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Abstract

This paper examines two criteria for relevance of management accounting information: the decision and the decision process. The study aims to show whether the information that is relevant to both the decision and the process of decision making (process-relevant) can lead to predictably different decisions compared to the information that is relevant to the decision but irrelevant to the decision process (process-quasi-relevant). Based on Drury (2018, p. 285) a field experiment was designed to test the hypothesis employing 352 students and PhD students. The results generally support the view that process relevance seems to be a superior to decision relevance as a qualitative characteristic of useful management accounting information. Fully rational agents would derive the same meaning, and thus the same utility, from both process-relevant information and process-quasi relevant information. Boundedly rational agents, however, as confirmed by the field experiment, derive different utility from the process-relevant information and the process-quasi-relevant information. If management accounting aims to partner managers in decision making, the focus of generating and communicating the information should be on the core driver of the better decisions, and this intuition suggests that the decision process should be a pivot for the management accounting information.

Keywords: management accounting, behavioral accounting research (BAR), qualitative characteristics of useful accounting information, cognitive biases, uncertainty

JEL: M41, D91

Introduction

Relevance has always been among the standards of qualitative accounting information, also considered as qualitative characteristics of useful financial information (Littleton, 1938, p. 235; Sterling, 1967, p. 100; AAA, 1974, p. 83; AAA, 1969, p. 47; CIMA, 2017 [2014]; IASB, 2018, §2.5, among others). However, claiming that relevance is an important qualitative characteristic of management accounting information is easy; to arrive at a relatively complete notion of its nature – is hard. Before I give you my reasons for this statement, let's have a look at one of the first definitions of relevant accounting information given

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by the American Accounting Association (AAA, 1966, p. 9, cited in Shwayder, 1968, pp. 86, 89):

> The standard of relevance is primary … For information to meet the standard of relevance, it must bear upon or be usefully associated with the action it is designed to facilitate or the result it is desired to produce. This requires that either the information or the act of communicating it exert influence or have the potential for exerting influence on the designed actions.

This definition contains the two main components of the traditional notion of this fundamental qualitative characteristic. First, relevance is associated with the potential to influence the decision (Feltham, 1968, p. 690; Riahi-Belkaoui, 2002, p. 6) or the end result, also defined as the goal to be achieved (Moonitz and Nelson, 1960, p. 208; AAA, 1962, p. 532; Chua, 1986, p. 609; Demski, 1973, p. 721). Second, relevance also relates to the users of the information and their specific needs. The following logical chain suggested in the Report of the Committee on Managerial Accounting Committee of the American Accounting Association (AAA, 1970, p. 1) applies here:

> Data that are *useful* to the decision maker must necessarily be *relevant* and relevant data are necessarily consistent with the decision maker's *task*. [emphasis added]

The implication is that relevance is not an independent existing feature of accounting information but a characteristic that is determined by the particular decision maker (Feltham, 1968, p. 690; AAA, 1974, p. 84), as well as in the overall context in which the information is used (Burchell et al., 1980, p. 11).

The conclusion is that relevance is associated with the end use of accounting information, which in turn depends on the users of the information. The latter makes relevance a behavioral issue – in terms of decision makers' goals; decision process; decision models, etc. This issue, although not completely neglected in accounting theory, is commonly underestimated. Ignoring the behavioral aspects of the concept of relevance, however, makes the concept less useful and creates a problem. This problem has been recognized in accounting theory for a long time, but the same does not apply to its root cause:

> There is a temptation, at this point, to dispense with the whole question concerning concepts underlying internal reports by saying that the only concept of general applicability in this area is the concept of relevance. That is, the usefulness of the result in meeting specific management problems. While this is true of internal reporting, such a general statement hardly justifies stature as an underlying concept. It does not provide guidance to accountants regarding methods to follow nor does it assist users on the interpretation of internal

> reports. When used with this meaning, the term relevance is more a statement of the problem rather than a solution of it. (AAA, 1962, p. 536)

This narrow and one-sided view of relevance as the "usefulness ... in relation to specific management problems" while ignoring the behavioral aspects of the issue, turns the concept into a "problem" rather than into a "solution" which could "provide guidance" and "assist users".

The study aims to show whether the information that is relevant to both the decision and the process of decision making can lead to predictably different preferences (decisions) compared to the information that is relevant to the decision but irrelevant to the decision process. Based on Drury (2018, p. 285), a field experiment was designed to test the hypothesis employing 352 students and PhD students. The results of this experiment support the hypothesis that process relevance seems to be superior to decision relevance as a qualitative characteristic of useful management accounting information.

The remainder of the paper is organized as follows. The next section critically discusses the existing levels of relevance of accounting information and logically justifies the decision process as part of the model of the influence of management accounting information on decision makers. The third section states the research hypothesis tested. The fourth section performs the field experiment. The fifth section summarizes the main empirical findings. The last section discusses the results and their practical implications. The concluding section suggests a few management accounting practices that may contribute to the generation and the proper communication of process-relevant information.

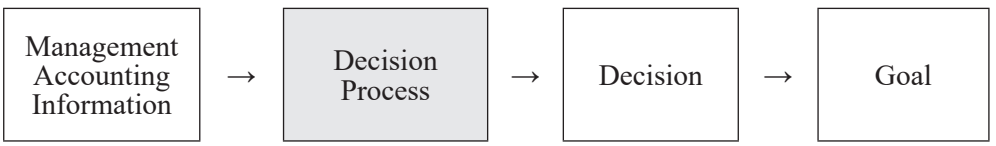
Literature review

The key to solving the problem with the narrow and one-sided view of relevance lies in understanding that the users of accounting information are part of the accounting system but not an element external to it. Incorporating behavioral aspects appropriately in our perception of relevance as a fundamental qualitative characteristic requires consideration of the different levels of relevance. These are generally three (Shwayder, 1968, pp. 88-89): (1) result relevance; (2) decision relevance and (3) semantic relevance – related "to the meaning of a message to a user". Shwayder (1968, p. 89) justifies these three levels of relevance with the following logic model: to affect goal fulfilment, information must influence user's decision; and to have an effect on a decision, it must influence the impressions of the user.

This logic model may be valid for the information in the general purpose financial statements, but for management accounting purposes it is too simplistic and as such it appears to be incomplete. It lacks the most important

element – the decision process. According to this model, information influences users' perceptions and this is enough for them to make a decision or not; the decision seems to be made automatically – neither analysis nor judgement are required. While in financial accounting it is very difficult (not to say impossible) to integrate the users' decision processes into the theoretical framework, in management accounting it is far more feasible to integrate these processes (or some of their key elements) into the model. The possible solution therefore lies in enriching Shwayder's logic model. User perceptions are not an independent element, but part of the stages of the decision process, which process is the missing chain logically connecting the accounting information and the decisions made (Figure 1). Management accounting information is the input for the decision process, and it is this process therefore that should be taken as a criterion for relevance. The decision itself is the output of the process – it is the final product or the result.

The suggestion above is consistent with the calls of many authors for a more closer engagement of management accounting research with the decision process (Campfield, 1959, pp. 558–559; Davidson and Trueblood, 1961, p. 581; Raun, 1961, p. 466; Kircher, 1961, p. 44; Murphy, 1976, p. 284; Bruns, 1968, pp. 469-470; AAA, 1969, p. 58, etc.). However, despite numerous attempts (by Bouwman, 1984, and many others) until the early 1990s, there was no progress in discovering any "discernible trends in user decision processes" (Birnberg and Shields, 1989, p. 46). Fortunately, recent advances in psychology and in behavioral economics allow the identification of general trends in the decision process that can be used to generate relevant management accounting information at each stage of this process.



Source: Author

Figure 1: Affect of the management accounting information on goal fulfilment – a behavioral model

Integrating the decision process into the logic model of the influence of management accounting information and turning it into a relevance criterion change the logic model in a crucial way. The bounded rationality of decision makers and their tendency to use heuristics leading to various cognitive biases in decision making (Tversky and Kahneman, 1974, p. 1124) make the decision process a key one. Process relevance is not a binary term. The rationale behind

is that information that affects users' perceptions may or may not help avoid cognitive biases in the decision process. I will refer to the first as information that is *process-relevant* and to the second as information that is *process-quasi-relevant*. Of course, information that does not affect perceptions will continue to be referred to as irrelevant.

The relationship between the decision process and the decision as criteria for information relevance is very interesting. Figure 2 summarizes the possible outcomes.

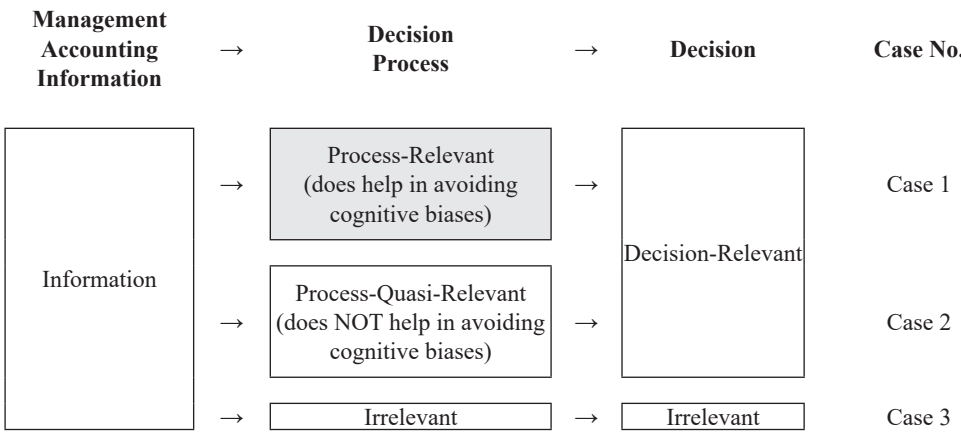


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Figure 2: Process-relevance and decision-relevance as criteria for accounting information relevance

- When information does not affect the perceptions of decision makers, it is completely ignored by them (it is irrelevant to the decision process) and therefore has no potential to change the decision (it is also irrelevant to the decision). This is case No. 3.
- When information influences the perceptions of decision makers, it has the potential to change the decision. In these cases (No. 1 and No. 2), the information is decision-relevant regardless of whether users choose to take advantage of it or not. However, we have two possible scenarios here:
  - in the first case, the information may contribute to some extent to avoiding cognitive biases, i.e., to be relevant to the decision process. This is case No. 1.
  - in the second case, the information may contribute nothing to avoiding cognitive biases, i.e., to be quasi-relevant to the decision process. This is case No. 2.

Case No. 2 is the problematic one. Here the information is relevant to the decision but quasi-relevant to the process of making that same decision. This means that it has the potential to influence the final result of the decision leaving absolutely unaffected all those cognitive biases to which the decision process itself is exposed. It is this result that shows the importance of choosing the decision process as a behavioral criterion for information relevance. This behavioral criterion takes the relevance of accounting information to its logical end by bringing it as close as possible to the end users. But this is not the whole story. It is also a criterion for the successful communication of accounting information, i.e., criterion for communication with impact. This is because only providing information in a way that counteracts the cognitive biases to which human thinking is exposed has the potential to affect goal fulfilment.

Research hypothesis

It is necessary to understand whether the process-relevant and the process-quasi-relevant information can result in different decisions, i.e., whether there is a difference between case No. 1 and case No. 2 (Figure 2). This would mean that the two types of information, which are equally relevant to a decision but not to the decision process, lead to different decision quality and thus have different utility for the users. The findings discussed above provide a basis for the following hypothesis:

Process-relevant accounting information and process-quasi-relevant accounting information lead to the same preferences (decisions) **(H_0).**

Process-relevant accounting information systematically leads to predictably different preferences (decisions) than those formed (taken) on the basis of process-quasi-relevant accounting information **(H_1)**

Experimental Method

Subjects

Subjects of the field experiment were 352 students in Economics and PhD students at the University of National and World Economy (UNWE, Sofia) including 119 BSc students[2], 25 MSc students[3], and 208 PhD students. Students are regular subjects in many of the behavioral experiments in accounting research (see, for example, Nichol, 2019; Evans III, Hannan, Krishnan, & Moser, 2001;

[2] Students' enrolment: "Finance and Accounting Taught in English", "International Economic Relations Taught in English", "Economics Taught in English", "Business Informatics and Communications Taught in English", "Marketing and Strategic Planning Taught in English" and "Business Economics and Management Taught in English" programmes.

[3] Students' enrolment: "Accounting, Financial Control and Finance Taught in English" programme.

Kim, 1992; Collins, Munter, & Finn, 1987; Uecker, 1981, and many others). For the purposes of this field experiment, students enrolled in economics or business BSc or MSc programmes are suitable respondents. They have the basic financial literacy acquired during their studies to enable them to make non-complex investment decisions. Similarly, PhD students (who have already acquired a master's degree) can also be considered suitable respondents, possessing the basic knowledge and skills necessary to take non-complex investment decisions as well as decisions based on much more limited information and fewer parameters than many of the decisions we often face in our everyday life.

Data and Procedure

The field experiment, based on the sampling method, was conducted in January 2023 twice – separately for each of the two groups of respondents – students and PhD students. Initially, the experiment was conducted in person among a total of 144 students. Participation was voluntary, anonymous and unpaid. The experiment was organized on different days for each of the two groups of respondents – for the BSc students – on the day of sitting the second mid-term exam; for the MSc students – on the day of attending the final semester exam. During the experiment, respondents were randomly assigned to one of the two groups receiving two different versions of the same investment case study.[4] The working time was 15 minutes.

In order to increase the representativeness of the results, the experiment was also carried out among the PhD students at UNWE. The survey was conducted online (MS Teams). Initially, an e-mail was sent to all 480 PhD students at the university with an invitation to join the experiment and to fill out the questionnaire. Again, participation was voluntary, anonymous and unpaid. PhD students were randomly assigned to one of the two groups.[5] Each group received a link to one of the two versions of the investment case study. Doctoral students were given a period of two weeks to participate in the experiment. A total of 208 PhD students responded to the invitation (43% of respondents).

A total of 324 completed questionnaires were received from both groups of respondents. Of these, 15 questionnaires (4.6%) were removed due to inadequate responses to the second case study in the questionnaire – which has to control for the level of concentration of the respondents. Thus, the total number of

[4] Once the students have taken their seats in the lecture hall (leaving an empty seat and an empty row between themselves), the questionnaires were handed out with the two scenarios alternating – each participant received a scenario different from that of the respondents sitting nearby.

[5] The full list of the PhD students at UNWE, arranged in alphabetical order by personal name, was numbered; even numbers form the first experimental group, and odd numbers form the other group.

respondents whose answers are used for the purposes of the analysis is 309 people (including 125 students and 184 PhD students).

For the purposes of the field experiment, a questionnaire was developed in two versions, which contain two ways of presenting the same information in content and scope, necessary for making an investment decision. The questionnaire for students (all of whom are in English-taught programmes) was in English, and the questionnaire for the PhD students was bilingual (in Bulgarian and in English). Both versions of the questionnaire have been pre-tested for comprehensibility among university economics professors.

Task

The participants in the experiment assumed the role of a CEO of an international corporation. There are two mutually exclusive investment alternatives – A and B, between which the respondents must choose their preference. Participants were informed that the two alternatives are exactly the same with regard to all variables (investment outlays, timing of cash flows, etc.) beyond those presented in the case study.

The two scenarios of the case are based on a hypothesis by Drury (2018, p. 285) that it is possible the outcome of a particular investment decisions to change only as a result of different ways of presenting the same accounting information. The scenarios were developed entirely on the basis of an illustrative example described by Drury (2018, p. 285); in the questionnaires the original description of the investment alternatives was only reshaped in tabular form. The values of the receipts, estimated costs and profits of the illustrative example have been kept unchanged in order to enable the transposition of the results obtained and their use for the purposes of confirming (or rejecting) the hypothesis underlying Drury's (2018, p. 285) example[6].

Figure 3 outlines the two scenarios of the case study. The baseline scenario (Figure 3, Panel 1) presents the receipts and expected costs of the two investment alternatives as single representative estimates and provides information on the range of possible outcomes for the costs for each alternative. The profit is presented as a representative estimate. For alternative A it is €90,000, and for alternative B – €100,000. The expectation is that *decision makers will generally prefer alternative B* (in which the estimated profit is €10,000 higher than that of alternative A).

[6] There are reasons to believe that a possible change in the original values, for example, in a way in which the financial result for each of the alternatives vary in a way of including also the possibility of having a loss, could further influence the judgment of the decision makers (because of for example the "loss aversion" bias).

The alternative scenario (Figure 3, Panel 2) presents the same two alternatives with the same expected value estimates of receipts and costs and with the same range of possible cost values for each of the alternatives. The only difference is in the way the profit is presented. Here it is represented as a range of possible outcomes. For alternative A this range is between €80,000 and €100,000, while for alternative B the range of profit is between €50,000 and €150,000. The expectation is that decision makers' preferences will be influenced by the way the bottom line is presented – *as a range of possible outcomes rather than as a single representative estimate – and they will generally prefer the more certain profit (i.e., alternative A).*

PANEL 1: Baseline scenario
(Process-quasi-relevant accounting information)

	Alternative A	**Alternative B**
1. Revenue	€500,000	€500,000
2.1. Range of costs	€400,000 – €420,000	€350,000 – €450,000
2.2. Cost estimate	€410,000	€400,000
3. Profit estimate (1–2.2.)	**€90,000**	**€100,000**

PANEL 2: Alternative scenario
(Process-relevant accounting information)

	Alternative A	**Alternative B**
1. Revenue	€500,000	€500,000
2.1. Range of costs	€400,000 – €420,000	€350,000 – €450,000
2.2. Cost estimate	€410,000	€400,000
3. Range of profits (1–2.1.)	**€80,000 – €100,000**	**€50,000 – €150,000**

Source: Author, based on Drury's (2018, p. 285) example.

Figure 3: Field experiment design

It is important to emphasize that the random assignment of the participants to the two scenarios eliminates the influence of all individual characteristics, including level of financial literacy, respondents' risk attitudes, etc. We may reasonably assume that in both groups of respondents the share of persons with high and low financial literacy, as well as the share of risk-averters and risk-takers are approximately the same, which at the aggregate level eliminates the influence of the individual (personal) characteristics of the respondents.

Empirical Findings

Table 1 and Figure 4 summarise the results of the experiment. They show that in the baseline scenario, when the information is relevant to the decision but quasi-relevant to the decision process, about 40% of respondents prefer alternative A, and 60% choose alternative B. In the alternative scenario, when the same information is presented in a form relevant to the decision process, the share of respondents who prefer alternative A increases from 40% to 50%, and correspondingly, the share of respondents who choose alternative B decreases from 60% to 50%. These results indicate that the two scenarios – the baseline scenario (based on the process-quasi-relevant information) and the alternative scenario (based on the process-relevant information) – lead to predictably different preferences and, accordingly, to a different choice of investment alternative. That difference is 10.1 percentage points.

Table 1: Investment alternatives preferred

Scenario	Preferences for Alternative A	Preferences for Alternative B
1	2	3
Baseline scenario (process-quasi-relevant information) N = 153	61 **39.9%**	92 **60.1%**
Alternative scenario (process relevant information) N = 156	78 **50.0%**	78 **50.0%**
Difference	**10.1 percentage points**	

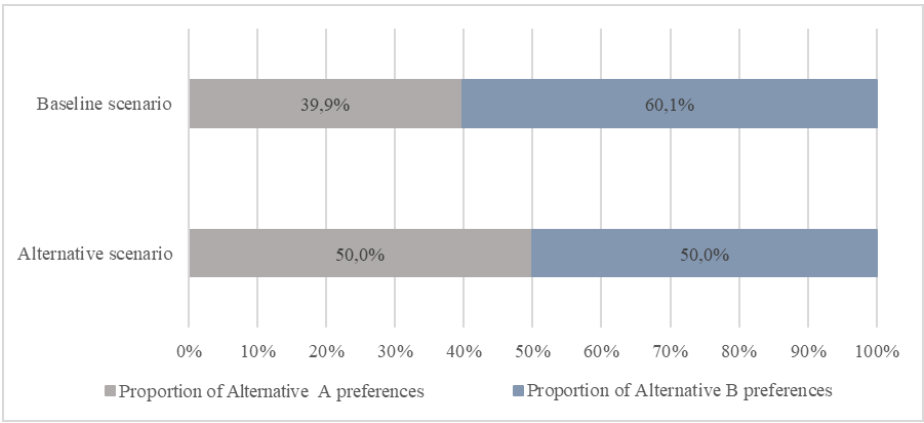

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Figure 4: Investment alternatives preferred, proportions

Otherwise stated, if we imagine that 100 people make the investment decision based on the process-quasi-relevant accounting information (Figure 5), 40 of them will choose alternative A and 60 will prefer alternative B. If the same 100 people make the same investment based on the process-relevant accounting information (Figure 6), alternative A will be preferred by 50 of them (10 people more), and alternative B – by the remaining 50 people (10 people less). The question is whether this difference is statistically significant.

Source: Author

Figure 5: Investment alternatives preferred, baseline scenario (process-quasi-relevant information)

Answering the question formulated above requires testing a statistical hypothesis for proportions using data from two independent samples. The null hypothesis states that the difference between the proportions of respondents who chose alternative A in the baseline scenario (p_1) and in the alternative scenario (p_2) is not statistically significant, i.e., H_0: $p_1 = p_2$. The alternative hypothesis (H_1) traditionally states that the difference between the two proportions is statistically significant (substantial). This formulation of H_1 relates to the so called "two-sided test" – a situation where the researcher has no logical expectation of one or the other direction of the inequality ($p_2 > p_1$ or $p_2 < p_1$). In our case, however, we expect the share of respondents who choose alternative A in the alternative scenario (p_2) to be significantly higher than the share of those who choose alternative A in the base scenario (p_1), i.e., H_1: $p_2 > p_1$. This formulation also meets Drury's (2018, p. 285) expectations regarding the results of his illustrative example. Thus formulated, the alternative hypothesis assumes a one-sided (right-tail) critical region.

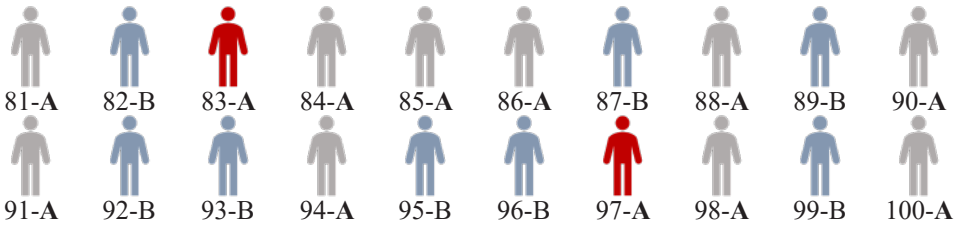

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Figure 6: Investment alternatives preferred, alternative scenario (process-relevant information)

When testing hypotheses for proportions with two independent large samples, the z-test criterion is applied which assumes a normal distribution of the z-characteristic value. In the specific case, a discrete binomial distribution is involved (only two possible values – choice of alternative A or choice of alternative B) and a test for normal distribution can be performed on the basis of two well-known statistical rules of thumb. The first rule is related to sample size. When examining the difference between proportions, it is accepted that the assumption of a normal distribution of the z-characteristic is fulfilled when the sample size is large, i.e., when there are at least 40 observations in each sample (Newbold, 1988, p. 316). In this case, the size of the first sample (the baseline scenario) is 153 observations, and the size of the second sample (the alternative scenario) is 156 observations, and we have all reasons to assume that the distribution of the proportion estimate in any of the two groups of respondents can be approximated by the normal distribution. Another statistical rule (Waller, 2008, pp. 169, 419) states that binomial variables can be assumed to have a normal distribution of the z-characteristic if:

$$np \geq 5$$

and

$$n(1-p) \geq 5$$

where:
n – sample size;
p – probability of choosing alternative A,
computed as follows: $(n_1p_1+n_2p_2)/(n_1+n_2)$;
$1-p$ – probability of choosing alternative B.

In our case, $np = 309 \times 0.45 = 139$, which exceeds many times the reference value 5. The same applies to the other criterion: $n(1-p) = 309 \times (1-0.45) = 170$. Based on that analysis, we can assume that the z-characteristic for testing a hypothesis for a binomial variable can be approximated by the normal distribution.

The principle of hypothesis testing is that when the empirical characteristic z_{Emp} falls outside the range of theoretical (expected) values under a valid null hypothesis ($z_{Emp} \leq -z_{Critical}$ or $z_{Emp} \geq z_{Critical}$), the null hypothesis is rejected and the alternative hypothesis is accepted. The empirical characteristic of the z-criterion (z_{Emp}) is calculated according to the following formula (Newbold, 1988, p. 368):

$$z = \frac{(p_2 - p_1)}{\sqrt{p_0\,(1 - p_0)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}},$$

where:

n_1 – sample size (baseline scenario);
n_2 – sample size (alternative scenario);
p_0 – common proportion of the preferences for alternative A;
p_1 – proportion of the preferences for alternative A (baseline scenario);
p_2 – proportion of the preferences for alternative A (alternative scenario).

The characteristic of the z-criterion based on the empirical values from the field experiment is:

$$z = \frac{(0.5000 - 0.3987)}{\sqrt{0.4498\,(1 - 0.4498)\left(\frac{1}{153} + \frac{1}{156}\right)}} = 1.7898.$$

The empirical value of the z-test (z_{Emp}) is 1.7898. The critical value of this criterion ($z_{Critical}$) at a one-sided critical region and a 5% risk of error is 1.6449 (see Levine, Stephan, Krehbiel, & Berenson, 2008, p. 491). Therefore, $z_{Emp} > z_{Critical}$, from which it follows that the null hypothesis is rejected, and the alternative hypothesis is accepted (Figure 7). Otherwise stated, *the difference of 10.1 percentage points is confirmed to be statistically significant at a 5% risk of error ($\alpha = 0.05$).* This means that the judgment of every tenth decision maker from the illustrative example is influenced by the way accounting information is presented.

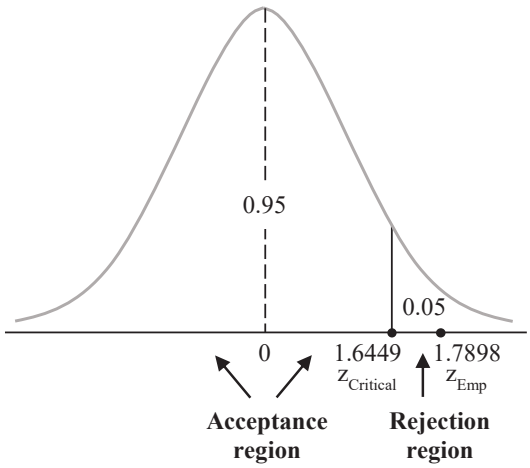

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Figure 7: Difference between two proportions, z-test

Discussion

The field experiment conducted is a new example of a departure from the "rational agent" model. It confirms the hypothesis of Drury (2018, p. 286) that "there is a need to incorporate the uncertainty relating to each alternative into the decision-making process", but it indicates much more. It shows that different ways of presenting the same accounting information are likely to lead to different judgments by decision makers and, accordingly, to different choices they make. Using the terminology of economic theory, this means that there is a preference reversal. But the model of the rational economic agent is not compatible with such a phenomenon. In the theory of rational economic agents, the assumption that individuals have stable preferences – that they rank alternatives based on their relative utility and make optimal choices – is a fundamental one. That is why Thaler (2016 [2015], p. 48) points out:

> Economic theory textbooks would stop on the first page if the assumption of well-ordered preferences had to be abandoned, because without stable preferences there is nothing to be optimized.

The different ways of presenting the same decision-relevant accounting information should not affect the judgment of rational agents and therefore should not lead to a difference in their decisions. Although economic theory cannot tell us which one of the two alternatives in the case study is preferable in general – alternative A or alternative B – the fact that there is a preference

reversal is a departure from the economists' model of rational choice. The model of bounded rationality is confirmed, in which people's cognitive abilities to process information in a fully rational way are limited; they do not optimize but satisfice. Fully rational agents would derive the same meaning, and thus the same utility, from both process-relevant information and process-quasi relevant information. Boundedly rational agents, however, as confirmed by the field experiment, derive different utility from the process-relevant information and the process-quasi-relevant information. This is because process-relevant information by definition helps (to some extent) in avoiding some of the cognitive biases in the decision process and, thus in improving the quality of the decision.

Concerning the specific field experiment, at least two biases have been involved. The first is the *excessive optimism bias* – "the tendency for people to be overoptimistic about the outcome of planned actions, to overestimate the likelihood of positive events, and to underestimate the likelihood of negative ones" (Lovallo and Sibony, 2010, p. 15). Respondents in the baseline scenario overestimate the probability of occurrence of the more favorable case (€100,000 profit in alternative B) and accordingly underestimate the probability of occurrence of the less favorable case (€90,000 profit in alternative A), leading to the misconception that the two values have roughly similar chances of occurring. But this is not the case. The expected profit of €90,000 for alternative A comes from a variation interval of ± €10,000 (11%), while the expected profit of €100,000 for alternative B comes from an interval with a much higher degree of variation: ± €50,000 (50%). The misjudgement of the probabilities of occurrence of the two profits leads to the observed result: respondents prefer alternative B (60%) to alternative A (40%).

Respondents in the alternative scenario directly observe the variation in the two profits (respectively, €80,000 – €100,000 for alternative A and €50,000 – €150,000 for alternative B). This inevitably provokes them to take the uncertainty into account in their judgment. As a result, both alternatives are chosen by an equal number of respondents (50% / 50%). Otherwise stated, process-relevant information results in a preference reversal by avoiding the excessive optimism bias.

The other bias involved in the field experiment is the overconfidence bias – "makes us overestimate the accuracy of our forecasts" (Hammond, Keeney, and Raiffa, 1998). Respondents overestimate their ability to be accurate in their estimates. It is obvious that respondents in the baseline scenario calculate a different range of values for the variable being evaluated (profit) than that which can be objectively calculated based on the cost variance information provided, and which is directly observed by the respondents in the alternative scenario. These different calculations influence their choices. If they generated the same range of values for the profits, the respondents' choices in the two scenarios would be the same.

Conclusions

The study addresses the issue of relevance of accounting information and shows that it is still a topic open for discussions. The results support the hypothesis that process-relevant information systematically leads to predictably different decisions than those taken on the basis of process-quasi-relevant accounting information. The most significant finding is that process relevance seems to be a superior to decision relevance as a qualitative characteristic of useful management accounting information.

The evidence presented in this paper raises a stimulating question for future research: which are the management accounting practices that can support us in avoiding cognitive biases in decision making. Fortunately, based on the findings in psychology and behavioral economics (Hammond, Keeney and Raiffa, 1998, Lovallo and Sobony, 2010, Kahneman, Lovallo and Sibony, 2011 and Sobony, 2020, pp. 288-290) a number of such kind of management accounting practices can be identified that may contribute to the generation and the proper communication of process-relevant information. These practices include but are not limited to: alternative problem framing; development of additional alternatives; provision of information external to the organization; recalculation of key values; ignoring sunk costs and explicitly stating opportunity costs; implementation of zero-based budgeting; taking into account the number of competitors and their expected behavior; determination of the key values by which the performance will be evaluated, among others.

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