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**Accounts of the future:
A multiple-case study of scenarios in planning and management control processes**

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Accounts of the future: A multiple-case study of scenarios in planning and management control processes

Purpose

This paper examines the design and use of scenarios in planning and management control processes.

Research approach

The study is based on an exploratory case-study approach. Qualitative data has been collected between 2008 and 2011 from three energy companies operating in Italy.

Findings

The paper sheds light on three styles of designing and using scenarios. In the first (called 'reactive'), scenarios provide a means for corporate actors to analyse past performance in the light of future expected performance. In the second ('proactive'), scenarios contribute to envision different future states of the world. In the third ('disciplined'), scenarios contribute to develop plausible, if not accurate, narratives about future outcomes.

Research limitations/implications

The study is comparative and exploratory. Possible areas for further work based on in depth-studies of scenarios within planning and control processes are identified.

Practical implications

The comparative analysis of the case-study material has implications for the ways in which flexible forms of management control can be mobilised by managers as a resource of action. It is shown that choices around the design and use of scenarios can mitigate some concerns with traditional planning and management control processes focused on the achievement of a single set of targets, but also raise new ones.

Originality

The paper sheds light on a scenario-based approach - called 'disciplined flexibility' - that avoids the restrictive nature of budgetary controls without losing the benefits of setting a plan and a target for the future. The paper outlines elements that may support the use of 'disciplined flexibility', but also its potential limitations.

Keywords: Scenarios, Planning, Management Control, Budgeting, Time

1. Introduction

Recent literature draws attention to the use of scenarios in planning and management control processes (Roche, 2010; Van der Stede and Palermo, 2011; Kaplan and Mikes, 2012; Merchant and Van der Stede, 2012; Becker *et al.*, 2016; Henttu-Aho, 2016; Sponem and Lambert, 2016). Textbooks and professional articles describe scenarios and scenario analysis as the *prospective* analysis of *multiple* futures *before* the measurement of performances occurs (Roche, 2010; Van der Stede and Palermo, 2011; Merchant and Van der Stede, 2012). Academic studies of budgeting reinforce the view that scenarios are supposed to be used only *before* the measurement of performance occurs. For example, Becker *et al.* (2016) show that different scenarios are used to ex-ante model the outcomes of different states of the environment. Sponem and Lambert (2016) provide evidence of the use of scenarios as a way to update strategy before the ‘drafting stage’ of highly participative budgeting processes.

This paper provides exploratory evidence on the use of scenarios and scenario analysis within planning and management control processes¹. The analysis that follows seeks to examine scenarios in their ‘broader and temporal contexts’ (Burns, 2014: 72), and offers two points of departure compared to previous work. First, while previous studies provide evidence of how scenarios help to set targets for future periods (Becker *et al.*, 2016; Henttu-Aho, 2016; Sponem and Lambert, 2016), this paper provides insights on the use, benefits and limitations of scenarios as planning and management control processes unfold in organisations, including their use in evaluating performance and target achievement. In doing so, the paper sheds light on how flexibility in evaluating performance can be achieved via scenarios without losing the well-researched motivational and coordination benefits of commitment to a fixed target (Hansen, Otley and Van der Stede, 2003; Merchant and Otley, 2006; Van der Stede, 2011).

¹ The terms ‘planning and management control process’ and ‘planning and management control cycle’ are used to include both the ‘decision-facilitating’ (e.g. planning and forecasting) and ‘decision-influencing’ (e.g. control and performance evaluation) roles of management accounting. As shown in the rest of the paper, the analysis primarily revolves around financial planning and budgetary controls, which have been known for long as ‘the cornerstone of the management control process in nearly all organizations’ (Hansen, Otley and Van der Stede, 2003: 95).

Second, previous work on scenarios in the accounting literature, especially textbooks and practice articles (Roche, 2010; Van der Stede and Palermo, 2011; Merchant and Van der Stede, 2012; Rigby and Bilodeau, 2015), embraces a linear view of time, whereby managers first develop different scenarios to prepare plans and targets for future periods and they are then held accountable for achieving the plan associated with the scenario that actually unfolds (Merchant and Van der Stede, 2012). But scenarios can be conceptualised as *accounts of the future* through which organisational actors bring expected future outcomes (and possibly known past events) into the present. This suggests to examine more closely the time orientations of those involved in the use of scenarios and how scenarios relate to the temporal structures defined by planning and management control processes. Drawing on research on accounting and time (see Ezzamel and Robson, 1995; Becker and Messner, 2013), the analysis presented in this paper sheds light on how scenarios can contribute to particular temporal structures and time orientations that shape expectations about controllability and accountability for future outcomes.

The empirical analysis which follows is comparative and exploratory with the intent to compare and contrast scenarios in different contexts and stimulate subsequent research on the topic. Drawing on qualitative material collected from three energy companies operating in Italy, the paper provides an overview of how scenarios are incorporated in the planning and management control cycles of the three case-study companies. Subsequently, it provides a case-based analysis of the relation between scenarios and the temporal structures defined by the planning and management control cycle of the three companies, the time orientations of those working with scenarios, and their perceptions of controllability and accountability for future outcomes. On this basis, the paper contributes to studies that focus on management accounting phenomena as processes that unfold over time, incorporating ‘temporality’ as a key element of explanation and analysis (Ezzamel and Robson, 1995; Becker and Messner, 2013; Burns, 2014).

Specifically, the paper offers three contributions. First, the paper enriches understanding of scenarios shedding light on different styles of designing and using scenarios – called ‘reactive’, ‘proactive’ and ‘disciplined’ – which reveal different temporal orientations and expectations about controllability and accountability for future outcomes. Second, building on a comparative discussion of these three styles, the paper provides insights on ways in which organisations can address concerns with planning processes and budgetary controls that emphasise the achievement of a set target in the context of changing business conditions. The analysis shows how certain design choices raise tensions related to, for instance, the extent to which managers can be held accountable for future outcomes or the extent to which scenarios can be seen as accurate representations of future states of the world. Third, the paper discusses one approach – called ‘disciplined flexibility’ – that increases flexibility in planning and control processes and, at the same time, mitigates concerns related to commitment to targets that may change over time.

The remainder of the paper is organised as follows. Section 2 reviews previous work in the accounting literature that provides evidence on the use of scenarios in planning and management control processes. Section 3 discusses the relevance of certain aspects of theories of time to the study of scenarios. Section 4 illustrates the study’s research methods, the three empirical settings and their planning and management control processes. Sections 5 to 7 present the three case studies. Section 8 provides a comparative discussion of key findings. Section 9 offers concluding reflections and discusses directions for future research.

2. Scenarios in the management accounting literature

A consolidated body of research in the strategy and management literature provides conceptual and empirical insights into scenarios and strategic planning (Wack, 1985; Schoemaker, 1993, 1995; Moyer, 1996; Grant, 2003). Scenarios are described as a way of capturing the interactions between internal and external performance drivers and defining a

synthetic story line around a limited set of possible future outcomes. They differ from tools such as contingency planning, which takes into consideration a single case base with an exception, and sensitivity analysis, which examines the effects of change in one variable. They also differ from ‘forecasting’, as they focus on better understanding future uncertainties rather than producing single point estimates. On this basis, scenarios can be conceptualized as *accounts of the future*: a set of narratives (accounts) that aim to capture in the present different future outcomes.

There is a limited body of work on scenarios and scenario analysis in the management accounting literature. Management control textbooks and practice articles suggest that scenarios, scenario analysis and scenario planning can be used to make the future intelligible via the *prospective* analysis of performance drivers and external factors (Roche, 2010; Axson, 2011; Van der Stede and Palermo, 2011; Merchant and Van der Stede, 2012). Scenarios are one among many other tools that may increase flexibility in planning and management control processes. As put by the CEO of Hewlett-Packard in relation to the company’s response to the financial crisis, ‘we started modelling more “what if” scenarios of what we thought could happen and what types of actions we would need to take’ (see Roche, 2010).

Scenarios received limited attention in the academic literature that has examined the ‘flexible’² forms of planning and management control processes through which organisations seek to adapt to increasingly unpredictable and volatile business environments (e.g. Hope and Fraser, 2003; Frow, Marginson and Ogden, 2005, 2010; Libby and Lindsay, 2010; Østergren and Stensaker, 2010; Bourmistrov and Kaarbøe, 2013; Henttu-Aho and Järvinen, 2013; Becker, 2014; Goretzki and Messner, 2016; Henttu-Aho, 2016). Nevertheless, recent studies of budgeting provide some evidence about the use of scenarios within planning and management control cycles. For example, Becker et al. (2016) show that organisations develop scenarios in order to model the outcomes of different but likely future states of their

² The term ‘flexible’ is used for processes that try to avoid or mitigate a top-down and command-and-control emphasis on achieving fixed targets, as expressed for instance in annual budgets, in order to address the uncertainties inherent in highly competitive and/or changing environments.

business context and react quickly in case planning assumptions prove untrue in times of economic crisis. Henttu-Aho (2016) shows how, in a Finnish company that tried to alter the static nature of the budgeting process, controllers prepared alternative scenarios of the future state of affairs to support internal discussions. Sponem and Lambert (2016) briefly mention the use of scenarios as part of the practices used in companies that revealed a highly participative budgetary process. Bourmistrov and Kaarbøe (2013) also suggest that ‘scenario building’ plays a role in the development of ‘intelligent guesses’ related to future states of the environment in which an oil company and a telecom company operate.

Studies such as these provide insights on the potentially beneficial role of scenarios in increasing flexibility in planning and management control processes. However, they provide little information about what scenarios look like in concrete organisational settings. The practices underlying scenarios and scenario analysis may range from quantitative modelling to business intelligence and professional judgement. The use of scenarios may also range from centralised strategy-level decisions to decentralised or function-specific processes (e.g. about sales or procurement). Moreover, previous work tends to focus on one aspect of scenarios and scenario analysis, namely how they can be used in the ‘drafting stage’ of strategic planning or budgeting processes. Little is known instead on how scenarios are used when it is time to review and assess performance. Indeed, the use of scenario information might be problematic when reviewing individual and organisational performance. Research has shown since long that hindsight and outcome biases are likely to affect the evaluation of performance (see Mitchell and Kalb, 1981; Hawkins and Hastie, 1990). The reason is that evaluators tend to use information on pre-results circumstances (e.g. drivers of performance), which was not available to those being evaluated when targets are developed (Merchant and Otley, 2006; Merchant and Van der Stede, 2012).

The analysis that follows contributes to fill these gaps in knowledge of scenarios and scenario analysis, by providing exploratory evidence on corporate-wide processes that inform both target setting and evaluation in three large energy companies operating in Italy. In doing so,

the paper examines the use of scenarios across different temporal phases of planning and management control processes. The following section explains how previous work on accounting and time helps to support the analysis in ways that extend beyond ‘textbook’ representations of planning and management control processes, where distinct phases such as planning, measurement, and performance evaluation are sequentially related (Merchant and Van der Stede, 2012).

3. Scenarios and theories of time

Accounting literature on scenarios, especially normative texts for practitioners and textbooks, tends to embrace a linear view of time when describing the use of scenarios within planning and control cycles. For instance, Merchant and Van der Stede (2012) argue that organisations use scenarios to apply flexible performance standards and define how resource requirements change if assumptions about competitive contexts vary from expectations. In the pre-measurement period, managers prepare plans for several alternative future scenarios and would be then held accountable for achieving the plan associated with the scenario that actually unfolds. After the measurement period, tools such as variance analysis, flexible budgets and subjective performance evaluations can be used to separate out the effects of uncontrollable effects. On this basis, past, present and future can be mapped to the phases of planning and control processes where planning, measurement, and performance evaluation are sequentially related. These phases progress forward from past to present to future and they are independent from the tools used, human action and experience.

Prior accounting research cautions against such a linear concept of time (see Ezzamel and Robson, 1995; Becker and Messner, 2013). Individuals and organisations shape time-reckoning modes and temporal structures. For example, trainees in multinational audit firms have been found to actively ‘manage’ time management devices to advance their own career goals (Anderson-Gough, Grey and Robson, 2001). Executives and financial analysts develop

different time-based ‘rationalities’, which affect their views about whether share prices should be considered long or short term-oriented measures (Chakhovich, 2013).

Accounting tools also contribute to the creation of temporal structures. Budgeting processes define the past and the future from the perspective of the present, contributing to the creation of recognisable temporal cycles and patterns of activity (Ezzamel and Robson, 1995; Becker and Messner, 2013). Information systems contribute to the construction of temporal (and spatial) distances in geographically-distributed organisations (Quattrone and Hopper, 2005). Business plans ‘actualize’ the future, creating ‘future facts’ in business planning (Giraudeau, 2012). Cost accounting contributes to making time to function as a managerial technology, incorporating it as a key cost driver that needs to be reduced (Mouritsen and Bekke, 1999). These insights suggest to examine the interdependencies between the production of scenarios and what has been called ‘temporal visioning’ (Ezzamel and Robson, 1995): the development of particular ways of thinking and defining temporal boundaries and future time horizons.

Specifically, three themes can be outlined. The first concerns the relation between scenarios and the *temporal cycles* defined by planning and management control processes. Becker and Messner (2013) remind us that management control processes such as budgeting and rolling forecasts can contribute to shape organisational actors’ understandings of time by defining key time horizons and time periods. Similarly, Ezzamel and Robson (1995) argue that managerial performances and expectations are often structured according to the requirements and deadlines set by tools and processes such as the annual financial statement, periodic performance reporting, budgeting and long-term planning cycles. For instance, the end of a budgetary period ‘gives rise to both organizational celebrations and personal relief; the unspent is often spent, and the psyche can prepare itself for another year’ (Ezzamel and Robson, 1995: 164). Studies such as these suggest to examine how scenarios can be mapped to different aspects or phases of the temporal cycles defined by an organisation’ planning and management control cycle. Organisations may emphasise the use of scenarios to inform a plurality of performance targets when planning for the following year and before measuring

performances; or they may use scenarios to assess managerial performance in the light of changing operating and environmental conditions.

The second dimension refers to the relation between scenarios and organisational actors' *temporal orientations*, i.e. their views of what part of time is relevant in the production and use of scenarios. Accounting research suggests that past, present and future are mutually determined rather than sequentially related, as 'control practices allow actors to relate to different times by bringing the future and the past "into" the present' (Becker and Messner, 2013: 142). For instance, entrepreneurs create 'future facts' in business plans, something that has some reliability and credibility in the present, but remains inherently linked to uncertain future outcomes (Giraudeau, 2012). Company executives and financial analysts develop different temporal 'rationalities' that affect how they perceive the benefits and limitations of present actions in the light of future outcomes (Chakhovich, 2013). Studies such as these suggest to examine what part of time is important for those working on the production of scenarios. The production and use of scenarios can be shaped by past knowledge and practices, different levels of agreement on what the past has been or views about how predictable the future is.

The third dimension refers to the relation between scenarios, *accountability for future outcomes and views about their controllability*. Accounting contributes to bringing past and future events into the realm of the present for performance evaluation via inscriptions (Ezzamel and Robson, 1995; Giraudeau, 2012). In so doing, accounting tools shape the way in which organisational actors understand, explain and react to events across different periods of time, defining expectations about accountability and controllability of future events. The paper by Becker and Messner (2013) provides several examples: through performance appraisal and incentive systems, managers and subordinates try to make sense of the past in a way that can influence future behaviour; investment appraisal systems discount future cash flows so that they are made calculable in the present. Examples such as these suggest to examine how scenarios contribute to understandings of controllability and expectations of

accountability for future outcomes. By mapping different future states of environmental and operating conditions, scenarios may expand accountability for a range of strategies and courses of actions to be carried out in the present; conversely, they may be used to isolate, with foresight, future outcomes that are to be considered beyond the control of managers.

To summarise, this section has discussed the relevance of certain aspects of theories of time to the study of scenarios within planning and management control processes. In so doing, it develops three dimensions of analysis that help to organise and make sense of the empirical material. These dimensions draw attention to how issues relating to time are conceptualised in the case-study settings, and how such concepts help us understand the production and use of ‘accounts of the future’ such as scenarios. These themes guide the comparative analysis of the features and organisational implications of scenarios in the three case-study settings, as illustrated in the following sections.

4. Research approach and case overview

This study is based on an exploratory multiple case-study approach (Eisenhardt, 1989; Yin, 2014), with the intent of shedding light on how scenarios can be related to aspects of planning and management control processes, stimulating subsequent research on the topic (see, for a recent use of a similar research approach, Becker, 2014).

As discussed in the previous section, this paper is motivated by scepticism with the linear view of time, prevalent in management control textbooks and practice articles, which suggests that scenarios can be mapped to sequentially-related activities such as planning, measurement and performance evaluation. Case-based research, and qualitative research in general, is considered particularly helpful to go beyond such ‘textbook’ views of management accounting (see Vaivio, 2008). The following sub-sections illustrate in more detail the research context and methods. An overview of scenario practices across the three cases is also

provided, before moving into the detailed illustration of their differences based on the analytical dimensions developed from research on accounting and time.

4.1. Research context

In this paper, I explore the production and uses of scenarios within the planning and management control cycle of three energy companies operating in Italy, drawing on data collected between 2008 and 2011. The choice to focus on energy companies is justified by theoretical and empirical reasons. First, prior literature has shown how the use of scenarios is a common practice in the planning and control cycle of companies operating in this industry sector (see Grant, 2003; Wack, 1985). Second, results from an earlier survey-based study on control systems in large companies operating in Italy confirmed that the cluster of energy companies (9 out of a total sample of 180) had unique features. Respondents claimed that planning and performance measurement tools were complemented by the use of scenarios and analysis of ‘risk factors’.

It was possible to select three out of these nine companies (hereafter anonymised as *Terra*, *Sol*, and *Luna*) for further investigation, and carry out interviews with Planning and Control (P&C) departments’ managers, risk managers and business unit managers. Survey findings, post-survey interactions³ and the analysis of annual corporate reports suggested that these three companies provided the opportunity to examine similar scenario-based processes. In all three companies, scenarios contributed not only to the definition of expected performance targets, but they also contributed to the set of information used by central P&C departments to analyse variances and assess BUs performances. On this basis, the selection of these companies as a site for a comparative case-study was to look for the ‘subtle’ differences (Eisenhardt, 1989: 540) between three cases that displayed apparent similarities.

³ Members of the P&C departments of the three companies participated to a workshop where survey results were presented. On this basis, it was possible to collect informal feedback on their management accounting practices, including their views about the use of scenarios.

At the time the interviews were carried out, the three case-study organisations could be characterised as follows. *Terra* is a large, internationally-active energy company. Its core activities relate to the supply, trading and marketing of gas and electricity in Italy and abroad. *Sol* is an Italian operator in the procurement, production and marketing of electric power, natural gas and crude oil. *Sol* is partially controlled by a large foreign operator in the energy sector. *Luna* is an Italian multi-utility company that operates in the areas of gas, electricity and water distribution, heating generation, and waste collection and disposal.

4.2. Data sources and analysis

The empirical basis for this paper relies on different sources of data, including site visits and interviews in the three case-study organisations between March 2008 and January 2011. To learn about the organisations' context and their planning and management control cycle, I collected public reports as well as internal documents. For each organisation, it was possible to collect at least one periodic report used for performance monitoring and evaluation. For each organisation, a 12-page questionnaire answered by a member of central P&C was also available. As anticipated in the previous section, this questionnaire was part of another project based on survey methods that aimed to explore the diffusion of performance scorecards across the largest firms operating in Italy (based on revenue size according to the data provided by the research unit of a leading Italian investment bank). The questionnaire provided descriptive evidence of the structure and resources of P&C units, accounting tools used for performance planning and control, and risk indicators.

In addition to documents and survey data, interviews with individuals working with different functions and in different organisational areas were carried out. In each case it was possible to collect the views of at least one person from central P&C personnel, BU control units and other staff functions (e.g. internal audit, risk management, strategy). 11 interviews were conducted in person, while 8 were conducted on the phone. Interview meetings lasted one

hour on average, although one interview was shorter (14 minutes only) due to the interviewee's time constraints⁴, while other meetings lasted longer than one hour. It was possible to record 9 interviews, which have been transcribed. For the remaining ones, notes were taken following the meeting. In addition to interviews, shorter follow-up interviews occurred in five cases.

A semi-structured interview guide was refined over the course of each interview and was organised into three major units: the business context and the planning and management control cycle; the roles and uses of scenarios and other management accounting tools as part of the planning and management control cycle; significant events that shape the production of scenarios, and forward-looking planning and management control process in general.

The data has been analysed in different stages. Documents, survey and interview material have been used to develop a single case narrative for each organisation (feedback on sections of the document has been obtained from interviewees when possible and relevant). Data has been subsequently analysed to identify a limited set of items that contribute to providing an overview of what scenarios look like in the three case-study settings, allowing a comparative analysis of their similarities and differences (see next section). Finally, I focused on the analysis of differences, drawing on the analytical themes drawn from research on accounting and time, with a particular focus on the relation between scenarios and the temporal cycles defined by existing planning and management control processes, the temporal orientations of those working on the production of scenarios, and their views about accountability and controllability for future events.

⁴ However, further feedback was collected subsequently via email.

4.3. Scenarios in the three cases: An overview

The three companies have similar planning and management control cycles, which are used to define performance targets and develop the annual budget and long term business plans. Table 1 summarises key features of the production of scenarios in the case-study organisations.

[Please insert Table 1 here]

The processes illustrated in Table 1 recall descriptions of planning and management control cycles in major oil companies (Grant, 2003). Scenarios are a relevant part of the early planning phase and contribute to the information used by P&C departments to analyse variances and assess BUs performances. The three cases also show similarities in terms of the factors underlying scenarios (e.g. regulations, market demand, and commodity prices), internal collaboration among different functions and levels of the organisation (central P&C departments, business units, risk offices, legal departments) and technologies (e.g. market analysis and statistical models for energy market data). There is an apparent difference in relation to the owners of scenarios. *Sol* reveals the direct involvement of a Risk Office, while in *Terra* and *Luna* the P&C departments are the pivotal actors for scenario development and short and long-term planning. However, the Risk Office reports to the CFO and is therefore part of the finance and accounting function.

The descriptive overview provided in Table 1 also shows differences in relation to the number of scenarios and their underlying factors. *Terra* and *Sol* focus mainly on energy and economic factors and develop a set of scenarios that act as reference points to set a single set of targets that are used for performance assessment and evaluation. In *Luna* multiple scenarios capture different outcomes of the interaction between a set of 'risk' factors, which have been defined through a one-off project led by the P&C department. The resulting set of scenarios reflects possible upward or downward trends in the future business context. On this basis, scenario analysis allows an understanding of the 'maximum risk exposure' for the company.

The following sections seek to exploit the benefits of a multiple case-study setting to explore in more detail whether distinctive features for each case can be found, drawing on the aspects of theories of time discussed in the second section of the paper.

5. Terra: Looking forward to the past

Terra develops a single set of performance targets based on a set of economic and energy scenarios that act as reference points for setting year-end targets and evaluating performance. Similar to the findings of previous research on budgeting (Frow, Marginson and Ogden, 2005, 2010; Libby and Lindsay, 2010; Bourmistrov and Kaarbøe, 2013; Henttu-Aho and Järvinen, 2013; Henttu-Aho, 2016; Sponem and Lambert, 2016), the concerns with a single set of fixed targets are mitigated by frequent revisions of expected performance results and the actual state of scenario drivers over the year. Monthly reports are used as the basis for performance appraisal at the level of business units. They also provide a forecast of the year-end result for the more ‘significant data’ (as described in a copy of the report). The ‘significant data’ are indicators on production and sales volumes, cost of crude oil, contribution margin, and after tax profits.

In the pre-measurement period, P&C personnel do not attempt to further elaborate on the interactions between scenario factors or develop a synthetic business scenario, as suggested in the strategy literature (Schoemaker, 1993, 1995). When asked, one interviewee from the P&C department argued that producing a synthetic scenario that incorporates sequential and reciprocal interactions between economic and energy factors is ‘highly complex’. The production of scenarios is, instead, intertwined with a review of the current state of the business context. This review contributes to identifying internal ‘constraints’ to future activities. Past performance trends, logistic and purchasing constraints are considered crucial information in order to come up with reasonable scenarios for future sales estimates.

The coexistence of aspirations to develop an analysis of future trends as well as reviewing past performance and logistic constraints suggests that the production of business scenarios is anchored to known performance trends. As for business plans (Giraudeau, 2012), the production of scenarios is grounded in past events. In fact, the analysis carried out by P&C is not considered 'anticipatory':

'At this moment, our activity is not based on information that allows us to take decisions with foresight. We are in a situation in which analysing numbers we understand if what has happened is what we were expecting. In such case, we decide if we continue in line with our past decisions or we need to change.' (Member of central P&C)

The quote above suggests that the production of scenarios is a way to map the environment in which the company has to operate and re-assess past decisions. One interviewee gave the example of business activity abroad, an area where the company is 'trying to understand whether to continue, keep things as they are, continue even more strongly, or even abandon it'. This mapping exercise can highlight significant issues that capture the attention of senior managers. The process of producing scenarios does not linearly progress towards the discussion of future outcomes and targets. It is rather 'diverted' from the temporal cycle defined by the planning and management control process, as something 'anomalous' emerges.

Such an 'anomalous' character is contingent on specific events that take place as scenarios are produced. Scenarios shed new light on past events, based on expectations of future outcomes. One BU controller refers to the case of a plant that is found to produce much less than expected and is therefore unable to achieve the targets that management wanted to set for the future period. The following quote suggests that, by using the term 'diversion', interviewees underscore how organisational attention shifts away from the planning of targets for future periods to the analysis of past problems with a remarkable use of organisational resources:

‘Let’s say that in one meeting the issue is recognised. But soon after there will be another meeting with front line people to say: What is happening? ... Is there a problem with maintenance? Is maintenance done, but not correctly? How can the problem be solved? [...] So we can have 20 meetings about this specific issue.’

A BU controller expressed similar concerns, emphasising the ‘multiple analyses of average results, past trends, expected future trends’ that are likely to occur if problems are detected in relation to the achievement of expected targets due to past problems such as internal inefficiencies or uncontrollable factors (e.g. the plant’s problems illustrated above). This emphasis on reviewing and mapping past and current performances is also related to frustration in relation to the controllability of future factors. One BU controller suggested that in her area of responsibility, they are ‘good at identifying potential problems, but not necessarily solve them’, especially when they relate to uncontrollable shocks in the business context such as changes in the political and regulatory context. These are the ‘key issues’ that are beyond control:

‘The issue has been identified, you know what it is, but the problem is how do you solve it? The problem is that you do not solve it because you are at the mercy of an external factor [...] this is not nice. I am not sure if this is because of our lack of ability or because of our operating context.’ (BU controller)

The recognition that a number of issues are beyond control is relevant in the assessment of performances. A standard way of analyzing variances is applied in terms of price, volume and efficiency variances. This analysis builds on pre-defined categories of ‘exogenous’ or ‘endogenous’ factors that may have an impact on performances. The former are considered beyond the control of management, while the latter are the ones that reflect ‘good’ management or ‘lacking management skills’ (as put by a member of central P&C). As suggested by Ezzamel and Robson (1995), accounting tools such as scenarios play a role in defining accountability for future outcomes and views about their controllability. Scenario factors are considered ‘exogenous’ in the analysis of variances, and they are not related to ‘good’ or ‘bad’ management.

6. Sol: Anticipating future outcomes

Economic and energy scenarios represent key inputs for financial and operational planning in *Sol*. Scenarios help to ‘map’ the context for *Sol*’s business operations. As put by one member of central P&C, they provide a ‘vision of the world’ that helps to plan activities for the years to come and set performance targets.

In a similar way to *Terra*, and in line with previous research (Frow, Marginson and Ogden, 2005, 2010; Libby and Lindsay, 2010; Bourmistrov and Kaarbøe, 2013; Henttu-Aho and Järvinen, 2013; Henttu-Aho, 2016; Sponem and Lambert, 2016), several tools and processes contribute to tracking progress against targeted objectives in the measurement period. Specifically, there is a set of measures that provides an indication of whether the factors underlying the scenarios moved up or down. When it comes to the analysis of actual performance, P&C personnel and BU controllers aim to ‘sterilise’ the effect of changes in the scenario. The monthly performance report provides information about expected and actual scenarios as well as data on financial results. Based on this information, P&C aims to understand who has worked well. As explained by a member of central P&C:

‘To say that we worked well or bad means first of all to “sterilise” the scenario [...] this is done by anchoring results to a set of indicators that can represent the scenario’s trend. What we do is to “sterilise” the scenario and say whether there have been some positive or negative effects due to the scenario. Then we can say that we have been more or less good in designing purchase or sales contracts that helped us to take advantage of the upward or downward scenario.’

Compared to *Terra*, however, effort is also put into the pre-measurement period to define a set of reference points that ‘accurately’ reflect what will happen in the next period. The ‘vision of the world’ developed through scenarios is constantly updated and monitored throughout the year. A formal round of revisions of the assumptions underlying scenarios is carried out in July. The aim is to capture the latest vision of the world and based on such a ‘vision of the world’ to adapt the financial and operational plans to provide more precise

performance targets, i.e. reflecting more closely changes in operating and environmental conditions.

While in *Terra* scenario activity gets ‘diverted’ when anomalies are traced, in *Sol* the temporal cycles defined by the budgeting process contribute to defining the pace of scenario activity. Rather than being sequential and linear, the pace of P&C’s activities accelerates as the budgeting process approaches an end. Interviews with P&C personnel suggest increasing anxiety when they face the need to revise scenarios and budgetary targets before finalising the financial planning package. When asked about their key challenges, a member of central P&C answered, without hesitation, that it was about meeting ‘tight’ deadlines. Central P&C personnel have to ‘quickly’ revise scenarios based on the latest information on how markets are moving, as well as indications provided by shareholders. Interviewees suggested that they need ‘precise’ information about business conditions to formulate ‘accurate’ targets. As put by a BU controller:

‘The aim is to re-do this exercise with the same level of detail based on how markets are moving, mostly because of market volatility. In this period there are strong oscillations [...] and therefore what is done is that [financial] planning is revised based on a new scenario, which is closer to the date in which the plan is finalised.’

The production of scenarios and the definition of budgetary targets also have implications for the experience of future outcomes and perceptions about their controllability, although in a diametrically opposite way compared to *Terra*. Scenarios are not considered entirely ‘exogenous’. The factors that underlie the definition of scenarios are actively managed as the budgeting period progresses in order to facilitate the achievement of expected targets. *Sol*’s managers should be able to work with ‘future facts’ (Giraudeau, 2012) . As explained by a member of central P&C, this implies finding ‘levers’ that help to cope with the business scenario:

‘So when I say scenarios, do not misunderstand me, it is not that the scenario is this and we are passive. It is not entirely an exogenous factor because ... we try to find levers that can help to cope at best with the scenario [...] we cannot define prices and costs in our market. These are already defined, but we are proactive. We try to structure our business activity in a way that helps to exploit contextual changes that we foresee. Hence it is not “this is the given scenario” and we do not do anything, we try to act on managerial levers that can generate profits.’

The structure of the business and type of business activity help to find such ‘managerial levers’. For example, *Sol* has a diversified portfolio in terms of contracts and delivery (e.g. where the gas is actually supplied). The more the gas is sourced abroad the greater the risk is, since there is a time lag between the purchase of gas and its transportation to Italy. Depending on a scenario’s prediction (e.g. cost of gas going up or down), contracts with different time lags (e.g. 6 or 9 months) can be more or less competitive. As explained by a BU manager, ‘when the scenario is expected to go up, a 6-month contract goes up more quickly in terms of cost and therefore is less competitive than a 9-month contract’. Therefore, decisions taken when scenarios are formulated, based on scenarios’ expectations, become part of the controllable factors that define good or bad management skills.

7. Luna: Developing plausible scenarios

While *Terra* and *Sol* develop separate economic and energy scenarios that are used as reference points in the financial planning and management control cycle, *Luna* examines the possible interactions between a set of factors that constitute a map of ‘strategic risks’. This map, initially very broad, was progressively made narrower. The use of the initial map was considered too difficult, especially in relation to the ambition to have an accompanying set of performance indicators:

‘The map was very rich, with around 80-90 items. To put it into practice was difficult. Now we look at a more narrow set of factors, around 10 areas such as the commercial side of the business with indicators such as the percentage of clients that choose a different provider.’ (Member of central P&C)

Compared to *Terra* and *Sol*, the presence of a prospective analysis of strategic risk factors suggests a greater emphasis on what can be done before the measurement of actual performances. In a similar way to what is described in the strategy literature (Schoemaker, 1993, 1995; Moyer, 1996; Grant, 2003), scenario analysis consists of a high-level description of different futures. Internal documents suggest that the scenarios reflect upward or downward (moderate or significant) trends in business conditions with, respectively, positive or negative effects on performance. As suggested in the quote above, each scenario is related to a map of ‘prospective’ performance indicators, which are used to assess the achievement of expected targets if that scenario materializes.

One target scenario is chosen for financial planning and management control purposes, the one that is considered the most plausible given what was known about the future at that time. In a quarterly review, central P&C presents to the Board a document that summarises actual performance trends compared to expected targets. A scorecard provides an overview of key results and how they compare with expected results. The latter are the ones that refer to the chosen scenario in the planning period. As put by one interviewee:

‘We identify a target scenario, on the basis of our understanding of macroeconomic and internal factors, our strategic drivers that we have already identified ... we apply [the scenario] and we carry out a sensitivity analysis. We then verify variances compared to our targets.’ (Member of central P&C)

In contrast to *Sol*, in *Luna*, at the end of the year, top managers (Business Directors, CEO, CFO), with the support of the P&C personnel, evaluate whether the target scenario or one of the alternative scenarios devised ex ante is more adequate for describing actual trends. As put by a member of P&C, they also tried to challenge planning assumptions, comparing the actual state of key drivers against expected trends.

Following such analysis, the target scenario is kept as the key reference point for performance evaluation, if it is considered to provide an adequate description of the actual trends of risk factors. Otherwise, one of the alternative scenarios has to be considered. Compared to *Sol*,

there is less emphasis on anticipating the actual development of the factors underlying business scenarios. Rather, a set of indicators is used to track the trends of the scenario factors and understand which one more closely reflects the way in which the business context evolved, no matter how different from the actual trends that can be analyzed with hindsight in the measurement period.

In a similar way to *Sol*, the case of *Luna* shows an emphasis on activity that can be done before the measurement of actual performance. However, *Luna* shows a different type of interrelations between scenario activity, the temporal cycles defined by the financial planning and management control process, and accountability for ‘uncontrollable’ factors. In *Sol* the distinction between scenario analysis in the planning phase and assessment in the review and evaluation phase becomes less clear-cut as managers are held accountable for the way in which they manage scenario factors. In *Luna*, in contrast, an effort is made to maintain a distinction between the information that is available in the formulation of scenarios and the information that is available when actual results are evaluated. During a follow-up meeting, one interviewee suggested that any given scenario should be sufficiently accurate to become the new basis for comparison with actual performance, if P&C personnel are able to stimulate managers to develop plausible scenarios in the planning phase.

In contrast to the other two cases, emphasis is not put on past events nor on anticipation of future outcomes. The use of scenarios is meant to stimulate a reflection on future outcomes given the information available in the present (planning period). It is recognised that such information is limited and will help to provide a plausible, yet not perfect, description of the future. But all together, scenarios should cover a range of possible outcomes, so that one can be used as a basis for performance evaluation. Targets are multiple and flexible, but they are not frequently revised during the planning period nor modified with hindsight after the measurement period (as suggested by those who are critical of budgeting systems, see Hansen et al., 2003; Hope & Fraser, 2003). When asked about whether this rigidity in target setting might be a source of problems, an interviewee pointed out how performance assessment is

also based on information about the relative performance compared to key competitors. In fact, a copy of an internal report shows external benchmark data on key measures. Relative performance evaluation is considered useful to provide a broader set of information against which individuals' achievements can be assessed. In such way, it is possible to address the possible obsolescence of performance targets and forecasting errors.

8. Discussion

Similar to prior management accounting research (e.g. Frow, Marginson and Ogden, 2005, 2010; Libby and Lindsay, 2010; Østergren and Stensaker, 2010; Henttu-Aho and Järvinen, 2013; Henttu-Aho, 2016), this study shows that management control processes such as financial planning and budgetary controls can be complemented, rather than replaced, by a range of tools and organisational arrangements. Specifically, the paper provides insights into what scenarios look like when they become part of the planning and management control cycles in three energy companies. In so doing, the paper extends knowledge of scenarios and scenario analysis within planning and management control processes. In this section, drawing on a comparative analysis of the case-study material, I firstly discuss different styles of designing and using scenarios and their potential benefits. Secondly, I discuss how different choices around the design and use of scenarios can mitigate some concerns with planning and management control processes, which require managers to achieve year-end budgetary targets despite changes in business conditions, but also raise new ones.

8.1. Design and use of scenarios: Styles and benefits

As discussed in this paper's review of the literature on scenarios, scenarios are considered part of corporate discussions that inform the definition of plans and targets for future periods (Henttu-Aho and Järvinen, 2013; Becker *et al.*, 2016; Sponem and Lambert, 2016). This

implies a ‘textbook’ view of planning and management control processes where distinct phases such as planning, measurement, and performance evaluation are sequentially related (Merchant & Van Der Stede, 2007). This paper has used previous work on accounting and time in order to extend this ‘textbook’ view (Vaivio, 2008) and obtain more nuanced insights about the functioning of scenarios within planning and management control processes. Drawing on this background, this study unpacks apparently similar planning and management control cycles, shedding light on at least three key differences.

First, while scenarios are aligned to the *temporal cycles* that contribute to defining budgetary targets and assessing performance results, the three organisations show a different emphasis on activity carried out in the pre-measurement and post-measurement phases. In *Terra*, the concerns with fixed targets are mitigated after the measurement period by frequent revisions of performance results and the actual state of scenario drivers to highlight ‘exogenous’ factors. In *Sol*, in contrast, effort is put into the pre-measurement period to define a set of key reference points that ‘accurately’ reflect what will happen in the next period. The subsequent ‘vision of the world’ is constantly updated and monitored throughout the year, with a sudden acceleration of activity close to the submission date of the final financial planning package. P&C personnel in *Luna* also emphasize work done in the pre-measurement period. The interactions between a set of ‘risk factors’ are examined and the resulting scenarios inform the development of distinct sets of targets (one for each scenario), which reflect potentially different business conditions.

Second, interviews reveal different *temporal orientations*. These are exemplified by different viewpoints on what part of time matters in developing scenarios: understanding past events (*Terra*), anticipating future events (*Sol*), and developing plausible futures (*Luna*). These different temporal orientations are interrelated with different views on the scope and aims of scenarios. Scenario analysis gets ‘diverted’ when anomalous past events are detected (*Terra*); scenario analysis aims to capture the latest and most precise view of future operating and

environmental conditions (*Sol*); scenario analysis develops plausible narratives about future outcomes that do not have to match the way in which the future actually unfolds (*Luna*).

Third, there are different perceptions of the *controllability of future events*. The perceived lack of controllability of scenario factors is a source of frustration in *Terra*. Scenarios contribute to constructing notions of uncontrollability, as ‘exogenous’ factors in variance analysis are related to the factors underlying the production of scenarios. In contrast, in *Sol*, the development of economic and energy scenarios contribute to defining ‘future facts’ (Giraudeau, 2012): new managerial levers that need to be actively used by managers. The material collected from *Luna* shows an emphasis on understanding uncontrollable factors and their potential interactions, but less emphasis on their active management.

These differences can be further elaborated to tentatively develop three different styles related to the design and use of scenarios (see Table 2) providing a counterpoint to previous work, which suggests that scenarios increase flexibility by encouraging the prospective analysis of multiple futures before the measurement of performances occurs (Roche, 2010; Kaplan and Mikes, 2012; Merchant and Van der Stede, 2012; Bourmistrov and Kaarbøe, 2013; Henttu-Aho and Järvinen, 2013; Becker *et al.*, 2016; Henttu-Aho, 2016). The material collected from the three case-study organisations questions the linearity that characterises the illustration of traditional planning and control cycles and their emphasis on what is done before and after the measurement of performances. It shows that the flow of time can be multi-directional (e.g. past and future into the present) and iterative, rather than linear (e.g. past to present to future).

[Please insert Table 2 here]

The case of *Terra* shows elements of what can be called ‘reactive flexibility’. Tools that are supposed to work as future-oriented aids to business planning and target setting paradoxically look forward to the past. The production of scenarios is orientated to past events and defines sets of uncontrollable factors that are described but not acted upon, neither in the pre nor the post-measurement phase. As put by one interviewee, the organisation is ‘good’ at identifying

problems, but frustration arises in relation to their management. The control style is also reactive as the production of scenarios can be ‘diverted’ by perceived anomalies that require further attention.

The case of *Sol* shows elements of what can be called ‘proactive flexibility’. In a similar way to *Terra*, concerns with fixed targets are mitigated through the act of ‘sterilising’ scenarios via variance analysis and frequent revisions of performance results and actual states of scenario factors. But the temporal distance between planning and measurement periods is compressed through the revision of scenarios and the aspiration to capture what is called the ‘latest vision of the world’. Scenarios contribute to a transformation of the present, incorporating future events and accountability for their management. The set of controllable factors is expanded to identify managerial levers that managers should use, forming part of their performance appraisal.

The case of *Luna* shows elements of what can be called ‘disciplined flexibility’. In this case, targets do not move, as business conditions change planning assumptions. There is discipline in the sense that performance evaluation is reconnected to the plausible business scenarios that could be developed with foresight in the planning phase. This means an emphasis on maintaining a distinction between what can be done in the planning and measurement periods to encourage people to engage with scenario-thinking and develop plausible, if not accurate, narratives about future outcomes. Uncontrollable factors, here including interactions between economic and energy factors, should be understood rather than actively managed (as in *Sol*).

Bearing in mind the limitations of observations that build on a limited set of exploratory data, this way of describing the use of scenarios provides a point of contrast to textbook illustrations of scenarios and scenario analysis (see Merchant and Van der Stede, 2012). A ‘disciplined flexibility’ approach enables managers to switch to different targets, but focusing only on those targets that relate to the scenarios initially developed. It does not allow, as Merchant and Van der Stede (2012) suggest, the ex-post consideration of the scenario factors

that indeed happened. This is an important distinguishing feature because the literature on hindsight and outcome biases (Mitchell and Kalb, 1981; Hawkins and Hastie, 1990) would suggest that constructing scenarios ex-post drawing on ‘actual’ factors could lead to set targets that are different from those that can be set ex-ante without knowledge of the actual trend of scenario factors. On this basis, a ‘disciplined flexibility’ approach might help to reap the benefits of more flexibility in target setting and evaluation without diluting the motivational effects of targets or attracting mistrust for using with hindsight ‘actual’ information about scenarios to renegotiate targets.

Overall, the comparative analysis of the three cases reveals a more nuanced view of the functioning and potential benefits of the use of scenarios within planning and management control processes. The case of *Sol* reminds us of previous work’s suggestions that scenarios can be beneficial as they help to envision different future states of the world and improve forecast accuracy. But the cases of *Terra* and *Luna* show how this outcome should not be taken for granted. In the first case, scenarios are seen as helpful as they provide an additional means to reflect on past performance. In the second case, the use of scenarios is not related to an ambition to obtain accurate forecasts and bridge the gap between present and future; indeed, the whole process is premised on maintaining a separation between what can be done in the pre and post-measurement phases.

This section has discussed different styles in the design and use of scenarios in relation to their potential benefits. As discussed in the next section, the case material also provides insights on the challenges that arise when scenarios become part of planning and management control processes.

8.2. *Design and use of scenarios: Challenges*

Prior work suggests that making planning and control processes more flexible can raise trade-offs such as the one between the advantages of performance criteria that can be flexibly

adjusted to changing operating and business conditions, and the motivational benefits of commitment to a set target (Frow, Marginson and Ogden, 2010; Van der Stede and Palermo, 2011). All three cases show the use of a pre-defined set of targets for performance evaluation. The concerns with the rigidity of such pre-defined targets in the context of changing operating and business conditions are addressed in different ways: ex post revisions of performance results and the actual state of scenario drivers (*Terra*); the search for accurate prediction of future states of the world (*Sol*); ex post use of multiple scenarios developed in the planning phase (*Luna*). But all the three cases show that different choices around the design and use of scenarios can mitigate some concerns with traditional planning and management control processes, but also raise new ones.

The 'reactive' approach of *Terra* emphasises the use of known past events and a formalised distinction between controllable and non-controllable factors. The production of scenarios builds on known past constraints (e.g. capacity and access). In the planning period, scenario analysis provides the chance for an 'in-depth' reflection on past events that constitute an 'anomaly' in the light of developing expectations about future outcomes (e.g. plants producing less than expected). Scenarios also contribute to shaping perceptions of 'uncontrollability' for future events. Scenario factors are considered as 'exogenous' elements and they are monitored rather than actively managed within the planning and control cycle. On this basis, scenario analysis can contribute to the in-depth discussion of anomalies. The production of an account of what future targets should be helps to delineate problematic areas in the present (e.g. business areas that will not be able to reach expected targets because of decreasing performance in the current period). But the case of *Terra* also shows frustration in relation to the lack of accountability on key 'future facts' (e.g. political and legislative changes) and limited ability to imagine future states of the world. The depth of analysis on single anomalous issues coexists with a narrow definition of controllable factors, which is perceived as a problem.

The 'proactive' approach of *Sol* is diametrically opposite to the case of *Terra* since it emphasises the need to capture future trends and expand the range of factors under the control of managers. The case of *Sol* reveals an emphasis on anticipation with an aspiration to capture the latest 'vision of the world' to inform targeted profitability. Rather than being sequential and linear, the pace of planning activities accelerates as the planning phase approaches an end (Ezzamel and Robson, 1995). In the case of *Sol*, performance standards are made more flexible as the temporal distance between the planning and measurement periods is compressed, by means of quick revisions of scenarios. This enables not only the definition of more 'precise' targets, but also the identification of managerial levers that can be used in the planning period to make the business context more favourable. Scenarios provide 'future facts' that constitute a basis for action in the present and extend the range of controllable factors (Giraudeau, 2012). But interview data shows increasing anxiety in relation to two aspects of managerial work. The first refers to the need to respect tight deadlines for the revisions of budgetary targets in order to capture the 'latest vision of the world'. The second refers to the ambition to develop, through such revisions of scenarios information, the most accurate vision of the world for target setting and performance evaluation.

The 'disciplined' approach of *Luna* seeks to avoid the restrictive nature of fixed targets by enabling managers to switch to more plausible targets. At the same time, flexibility is 'disciplined' as managers are constrained by the narratives developed in the planning period. A 'disciplined' use of scenarios seems a potentially rewarding way to avoid hindsight and outcome biases that may lead evaluators to use information on pre-results circumstances, which was not available when targets were developed (Mitchell and Kalb, 1981; Hawkins and Hastie, 1990). And yet the exploratory evidence provided in the empirical sections suggests that these potentially beneficial outcomes are achieved at the cost of recognized limitations in terms of accuracy and controllability (i.e. plausible, albeit imperfect, scenarios).

The case of *Luna* can be further analyzed to tentatively discuss how contradictory ambitions (e.g. flexibility and commitment) can be addressed and managed. The approach of *Luna*

seems to mediate the contradictory ambitions for a control process that is ‘flexible’ but ‘disciplined’. While further work is needed to uncover the implications and dynamics of such an approach, the exploratory study presented in this paper reveals two elements that help to reconcile these apparently contradictory ambitions.

The first element for this reconciliation refers to the ambition and ability to develop plausible, albeit not necessarily precise, scenarios and ex post draw upon the closest matching scenario for performance evaluation. The potential incompleteness and lack of precision of scenarios is not considered a pressing concern and enables the flexible use of performance tools. This finding contrasts with uses of budgets ‘in process’ (Frow, Marginson and Ogden, 2010), where efforts are made to anticipate problems and not being taken by surprise (see, for other examples of budgetary styles that stress forecast accuracy, Bourmistrov and Kaarbøe, 2013; Henttu-Aho, 2016).

The second element refers to the use of relative performance evaluation. This finding recalls arguments made by the beyond budgeting movement (Hope and Fraser, 2003), which emphasised the need to rely on external benchmarks rather than internally developed targets. But, as illustrated earlier, the key feature in the case of *Luna* is that relative performance evaluation is used in combination with scenarios-informed planning and control cycles and performance targets. In a similar way to prior studies of flexible forms of management control (Frow, Marginson and Ogden, 2005, 2010; Libby and Lindsay, 2010), it is the use of different tools in addition to budgetary controls which helps organisations to maintain commitment to set targets and cope with the uncertainty of changing business contexts.

9. Conclusions and directions for further research

The study presented in this paper is comparative and exploratory. It seeks to complement and extend prior work on planning and management control processes, but also elicit further research on a topic, such as scenarios, which is of clear relevance for organisations that have

to deal with volatile business environments and increasingly interdependent uses of resources (Merchant and Van der Stede, 2012).

Drawing on research on accounting and time (see Ezzamel and Robson, 1995; Becker and Messner, 2013), the case material is compared and contrasted to highlight three styles of designing and using scenarios, called 'reactive', 'proactive' and 'disciplined'. These styles emphasise different aspects of the temporal structures defined by planning and control cycles, different viewpoints on the relevance of past events or future outcomes, and different perceptions of controllability of future outcomes.

By illustrating these different styles, the paper shows how organisations may address one key tension that characterises the use of 'flexible' planning and management control processes, namely how to reconcile the benefits of adjusting performance targets in the face of changing business conditions with the coordination and motivational benefits of commitment to a set target (Hansen, Otley and Van der Stede, 2003; Merchant and Otley, 2006; Frow, Marginson and Ogden, 2010; Van der Stede, 2011; Van der Stede and Palermo, 2011; Merchant and Van der Stede, 2012). The comparative analysis draws attention to the ex-post revisions of performance results and actual state of scenario drivers ('reactive' style), the search for accurate predictions of future states of the world ('proactive' style), and the ex-post use of multiple scenarios developed in the planning phase for performance evaluation ('disciplined' style). By exploring the use of scenarios as the planning and management control processes unfold in the three case-study organisations, the paper also shows how these different styles raise new issues related to, for instance, the extent to which managers can be held accountable for future outcomes or the extent to which scenarios can be seen as accurate representations of future states of the world.

Besides contributing to knowledge of scenarios' design and use in planning and management control processes, the paper contributes more broadly to calls for research that takes 'temporality' seriously (Ezzamel and Robson, 1995; Becker and Messner, 2013; Burns,

2014), by examining how people's time orientations and organisational temporal structures shape perceptions of accountability and controllability for future outcomes. Compared to previous research on planning and management control processes (e.g. Frow, Marginson and Ogden, 2005, 2010; Merchant and Otley, 2006; Merchant and Van der Stede, 2012), the paper shows how tools such as scenarios interrelate with concepts of time in organisations. As an outcome, the paper problematises stylized representations of planning and management control cycles, and in particular distinctions between what can be done before or after the measurement of performances to make planning and management control processes more 'flexible'.

The comparative analysis of the case-study material has also implications for the ways in which flexible forms of planning and management control can be mobilized by managers as a resource for action. It is shown that choices around the design and use of scenarios can mitigate some concerns with traditional planning and management control processes, but also raise new ones. Moreover, by comparing and contrasting the three cases, the paper develops the notion of 'disciplined flexibility'. Planning and management control processes can avoid the restrictive nature of fixed targets by enabling managers to switch to more plausible targets; at the same time, flexibility is 'disciplined' as managers are constrained by the narratives developed in the planning period. The paper tentatively discusses the relevance of two elements that contribute to achieving such a form of flexibility: the willingness and ability to develop plausible, if not accurate, narratives of future outcomes; the presence of external benchmarks of performance.

An intended implication of this exploratory study is to promote further research on novel practices in planning and management control cycles. Specifically, in-depth case studies might help to extend, refine or challenge the different styles of scenarios design and use developed in this paper. Further work could also build on the notion of 'disciplined flexibility' and enhance knowledge of the conditions that support its operationalisation in organisational settings. For instance, in the research period, the target chosen in the planning

phase was used in *Luna* for performance assessment. But it remains unclear what would happen if organisations need to switch to another target under a ‘disciplined flexibility’ approach. In-depth studies would help to understand the organisational frictions that are likely to emerge and how these tensions can be addressed and eventually solved. In a similar way, in-depth studies would help to understand the internal dynamics through which benchmarking data are combined with budgeting information, and their implications for the sustainability of a ‘disciplined flexibility’ budgetary style. It is reasonable to assume that the two sets of information are unlikely to be perfectly aligned in most cases. To conclude, all these topics are examples of potentially fruitful areas for future research, which can be encouraged by the exploratory study presented in this paper.

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	<i>TERRA</i>	<i>SOL</i>	<i>LUNA</i>
Scenarios and targets	<ul style="list-style-type: none"> • Several economic and energy reference scenarios (exact number can vary over time) • A single set of targets related to the final draft of scenarios and plans is developed and used for performance evaluation 	<ul style="list-style-type: none"> • Three 'reference' scenarios (market, commodity, exchange rates) plus regulatory context • A single set of targets related to the final draft of scenarios and plans is developed and used for performance evaluation 	<ul style="list-style-type: none"> • Scenarios indicating upward/downward business context • Sets of targets related to each scenario • One scenario used as reference point
Scenarios factors	<ul style="list-style-type: none"> • Regulations, market demand, exchange rates, commodity prices • Also include analysis of logistic constraints • Each factor provides a reference point and sets the operating business context 	<ul style="list-style-type: none"> • Regulations, market demand, exchange rates, commodity prices • Each factor (cluster of factors) provides a reference point and set the operating business context 	<ul style="list-style-type: none"> • A set of 'strategic risk factors' including regulatory, market, exchange rates, commodity prices and climate changes
Timeframe	<ul style="list-style-type: none"> • January/March: first draft of scenarios • April-June: financial and operational plans • July/September: revising scenarios • September: updating planning and budgeting targets 	<ul style="list-style-type: none"> • January/March: first draft of scenarios • April-June: financial and operational plans • July/September: revising scenarios • September: updating planning and budgeting targets 	<ul style="list-style-type: none"> • January/April: production of business scenarios • April-June: financial and operational plans • July/September: planning and budgeting targets
Key actors	<ul style="list-style-type: none"> • P&C central department coordinating data collection and update 	<ul style="list-style-type: none"> • Risk Office (part of P&C) coordinating data collection from BUs and market analysis 	<ul style="list-style-type: none"> • P&C central department coordinating data collection • P&C also leading selection of strategic risk factors through a one-off project
Supporting technologies	<ul style="list-style-type: none"> • Market analysis and statistical models for energy market data • Interaction central P&C and BUs 	<ul style="list-style-type: none"> • Market analysis and statistical models for energy market data • Ad hoc task forces for regulatory factors • Interactions RO, P&C and BUs 	<ul style="list-style-type: none"> • Market analysis and statistical models for energy market data • Interaction central P&C, BUs and risk office
Complementary control tools	<ul style="list-style-type: none"> • Monthly reporting (Heads BUs); quarterly reporting (CFO, CEO, Board) • Financial and non-financial measures, including 'key' measures (volumes of production, cost of crude oil, sales volume, contribution margin, after tax profits) • Variance analysis reports 	<ul style="list-style-type: none"> • Monthly reporting (Heads of BUs, CFO, CEO, COO) • Financial and non-financial measures, including 'key' measures (mainly financial measures) • Variance analysis reports 	<ul style="list-style-type: none"> • Monthly reporting (Heads of BUs, CFO, CEO) • Financial and non-financial measures, including 'key' measures (mainly financial measures such as EBITDA) and a set of relative performance data (e.g. competitors' sales volume) • Variance analysis reports

Table 1: Scenarios in the three case-study organisations

	Terra: Reactive flexibility	Soi: Proactive flexibility	Luna: Disciplined flexibility
Temporal cycles and target setting	<ul style="list-style-type: none"> Fixed targets mitigating the effects of uncertainty ex post 	<ul style="list-style-type: none"> Fixed targets anticipating uncertainty ex ante 	<ul style="list-style-type: none"> Flexible targets incorporating uncertainty ex ante
Temporal orientations and scope of scenarios	<ul style="list-style-type: none"> Understand the past and map the business context Diverted by anomalous events 	<ul style="list-style-type: none"> Anticipate future outcomes Capture the latest and most precise 'vision of the world' 	<ul style="list-style-type: none"> Describe future outcomes Develop plausible narratives
Accountability and controllability	<ul style="list-style-type: none"> Define a set of uncontrollable factors 	<ul style="list-style-type: none"> Expand the set of controllable factors 	<ul style="list-style-type: none"> Understand uncontrollable factors and their interactions

Table 2: Flexibility in management control