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2021-09-10

Deposited version:

Accepted Version

Peer-review status of attached file:

Peer-reviewed

Citation for published item:

Barros, R. S. & Ferreira, A. (2021). Management control systems and innovation: A levers of control analysis in an innovative company. *Journal of Accounting and Organizational Change*. N/A

Further information on publisher's website:

10.1108/JAOC-09-2020-0137

Publisher's copyright statement:

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Management control systems and innovation: a levers of control analysis in an innovative company

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Author Accepted Manuscript

Forthcoming: *Journal of Accounting and Organizational Change*

DOI: 10.1108/JAOC-09-2020-0137

¹ Acknowledgements:

The authors would like to thank the editor, Professor Zahirul Hoque and the two anonymous reviewers for their helpful comments and suggestions. Also, we gratefully acknowledge comments and suggestions from Robert Scapens, Grazianno Coller, Jonas Oliveira, João Oliveira and Ricardo Barradas, participants at the conference “Researching Management Accounting and Control: Reflections on its impact and implications for the future” held in Groningen, the XVII conference grudis and doctoral colloquium held in Porto and two anonymous reviewers of the 41st annual congress of the European Accounting Association. We are also grateful to interviewees for their time, help and sympathy and the case company to allow the development of this work. Rúben Silva Barros also gratefully acknowledge the financial support of Fundação para a Ciência e Tecnologia under the doctoral grant SFRH/BD/104181/2014. The authors are also grateful for the financial support of this institution under the grant UID/GES/00315/2013 and UIDB/00315/2020.

Management control systems and innovation: a levers of control analysis in an innovative company

Abstract

Purpose: Building on the growing body of research that has addressed management control systems and innovation, the goal of this study is to assess the extent and nature of the use of controls in an innovative setting and how they work together unveiling the relationships and tensions amongst the Simons' levers.

Design/methodology/approach: This study resorts to an in-depth and single case study in a company that has both a strong orientation to innovation and stable control practices in place. Evidence was collected from 32 interviews, visits to the company, and internal documentation.

Findings: At the case company it was possible to find the presence of controls according to all the levers of control. Likewise, joint effects of controls used according to interactive and beliefs approaches and diagnostic and boundary controls showed a consistent reinforcement that push the organization in a single direction. Signs of some countervailing reinforcement between these pairs were also detected, creating tensions. This in general shows that innovation can be weighed against the necessity of goal achievement taking place within fields in which the company can exploit the effort developed.

Originality: This study documents the collective use of controls in a context in which innovation is needed, and how the combination of the levers of control with their inner workings and tensions allow the company to have a corporate environment of innovation that is friendly.

Keywords: Innovation; Management Control Systems; Simons' framework; Case study; Levers of Control

Article classification: Research Paper

1. Introduction

Management accounting and control literatures have enquired into and advanced our knowledge on Management Control Systems (MCS) and Innovation with several recently published papers (e.g.: Bedford, 2015; Curtis and Sweeney, 2017; Aaltola, 2018; Healy *et al.*, 2018; Barros and Ferreira, 2019; Bellora-Bienengräber, 2019; Müller-Stewens *et al.*, 2020; Rathnasekara and Gooneratne, 2020). This has allowed considerable knowledge to be accumulated, but there remains the “*need to undertake further research into how management accounting and control practice realized by the managerial actors jointly and individually can contribute and relate to innovation*” (Major *et al.*, 2018: 154). Additionally, as van der Kolk *et al.* (2020) recognize, the inner workings of combinations of controls are an area quite unexplored, and considering that control in innovative settings is an especially complex matter, with various aspects to considerer, much has yet to be understood. As posed by Feeney and Pierce, “*the complex, non-linear nature of innovation requires the use of a range of styles of control*” (Feeney and Pierce, 2018: 271).

A common way that researchers have addressed this topic is by resorting to the Levers of Control (LOC) framework. The LOC framework is widely employed as the framework for both quantitative and qualitative studies (see, Martyn *et al.*, 2016). Regarded as a practice-informed framework (Martyn *et al.*, 2016), LOC reflects the use of multiple controls and different styles of their use (Chenhall and Moers, 2015). Consequently, this study builds on this background recognizing the core principle proposed by Simons (1995) that all levers must work together. Specifically, we explore the extent and nature of the use of controls according to the Simons framework and how the controls used work together amongst the Simons’ levers. This will also allow us to explore the interrelationships and possible tensions that may surface between these levers. To do this, we conducted an in-depth case study at Amorim Cork Composites (ACC), a Portuguese enterprise that produces granulates and agglomerates of cork.

The organization that is the subject of this case study is an innovative branch of a Portuguese industrial group that has implemented a Performance Measurement System (PMS) for a considerable time, and has a strong orientation toward innovation. We used semi-structured interviews as the main data source, complemented with internal documents and direct observations. A total of 32 interviews were conducted, having an

average duration of 60 minutes. ACC continuously engages in product innovation driven by customers' requests or needs. Innovation at the case company most often takes the form of new cork products, new developments of existing products, a new application for an existing cork product, or the transfer of an existing product to another and completely different market segment. Therefore, this will be the concept of innovation adopted throughout the study. Also, we adopt Simons' (1995) definition of MCS: "*management control systems are the formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities*" (Simons, 1995: 5).

This work contributes to research in several ways. The main contributions are to the literature on management control and innovation. First, with the aims of this research it is possible to explore the inner workings of the control elements according to the LOC framework. The presence at the case company of controls according to all the levers leads to a consistent reinforcement within the inspirational levers (interactive and beliefs levers) and within the constraining levers (diagnostic and boundary levers). This results in having both pairs pushing in different directions. These combinations create countervailing reinforcement that allows the environment to be controlled and simultaneously innovative.

The latter pair pushes for proactivity, debate, and forums, while the first provides some constraint, without a crowding out effect. This reveals tensions, which in light of van der Kolk *et al.*'s (2020) developments comprise a two-dimensional relationship having the marks of complementarity and competition effects. The control solution in place reveals different intensities in the use of the levers (diagnostic and interactive use of systems are more emphasized than boundary systems), and stronger presence of some (diagnostic and interactive) over others (beliefs and boundary).

In line with the contribution mentioned, the present study also contributes to the literature on the simultaneous use of different control practices. Instead of focusing on only a single isolated system, this study looks at MCS in a holistic and comprehensive way, as recommended by several authors (e.g., Malmi and Brown, 2008; Ferreira and Otley, 2009; Grabner and Moers, 2013). A range of practices and how the managers at the case company mobilize them is reported, including a Balanced Scorecard (BSC) model, a stage-gate model, formal meetings, mission, and values.

Third, the results contribute to literature by showing that the case company can provide an environment in which innovation flourishes, side by side with structured processes at a corporate level that do not make it necessary to trade innovation for control (extending Speklé *et al.*'s (2017) conclusion about control and creativity). The control tools implemented, and the way managers use them allow us to assess more than the weight of innovation against the necessity of goal achievement and confirm that it can take place within fields in which the company can appropriate the expected benefits of new solutions. This also makes space for a practical contribution in the sense that insights are offered to practitioners regarding the design and use of MCS in companies that have a strategy strongly oriented to innovation.

With these contributions this study responds to several calls to dig deeper into issues related to control and innovations (e.g., Moll, 2015; Fried, 2017; Major *et al.*, 2018; Baird *et al.*, 2019), and calls to address this line of research with qualitative approaches (e.g., Henri, 2006; Barros and Ferreira, 2019).

The remainder of the paper is organized as follows. The next section presents a synthesis of the research that has been developed on MCS and innovation. The research methods adopted are described in the third section, as well as the data collection and the data analysis procedures. The fourth section introduces the case company. The fifth section provides a description of how management control tools are used according to the LOC framework, and then describes the combination of the levers regarding innovation. The sixth section provides a discussion of the results, the conclusions, limitations of the study, and some avenues for future research.

2. Literature Review

As stated by Chenhall and Moers (2015), nowadays MCS encompass more complex calculative practices due to the challenges that managers encounter in managing under uncertain conditions in which innovation gains greater importance. The literature on innovation and MCS reports different approaches followed to analyse the role of MCS in innovation. Authors have resorted to a variety of frameworks upon which to base their

findings. Both in management accounting literature in general (see Martyn *et al.* (2016) for a review of empirical research studies on LOC), and in this stream of research, a common framework used is Simons' levers of control. As Aaltola (2018) mentions, Simons' levers of control framework has offered a new perspective for management control. Indeed, the LOC framework represents a comprehensive way of balancing innovation and efficiency, and since the publication of Simons' works, some authors have re-examined the role of MCS and PMS on innovation (Moll, 2015). The LOC framework has the distinct feature of considering the use of multiple controls as well as different ways of using management accounting (Chenhall and Moers, 2015) – and in this new paradigm, as some authors put it (e.g., Moll, 2015; Barros and Ferreira, 2019), a common theme is the use of a multiplicity of controls. Analysing more than isolated systems has been well grounded in the literature (e.g., Malmi and Brown, 2008; Ferreira and Otley, 2009; Grabner and Moers, 2013).

2.1. *Simons' Levers of Control framework*

Conceptually, the LOC framework proposes that to successfully implement strategy, managers must consider four levers of control: diagnostic, interactive, beliefs, and boundary systems (Simons, 1995; Simons, 2000). Diagnostic controls are the more formal information systems that managers rely on to monitor outcomes and correct deviations (Simons, 1995; Simons, 2000). To operate diagnostic levers managers must set goals, align performance measures, design incentives, and review and follow exceptions (Simons, 2000). Interactive systems are a two-way process of communication (Mundy, 2010) that allow managers to involve themselves in the decisions of subordinates on a regular basis (Simons, 1991; Simons, 1995; Simons, 2000). Bisbe *et al.* (2007) engage in an in-depth examination of what defines an interactive control system and provide five properties for it. It arises from these properties that using MCS interactively comprehends an intensive use by top management and operating managers, face-to-face challenges and debates focused on strategic uncertainties, and a facilitating and inspirational involvement (Bisbe *et al.*, 2007). Belief systems, which are reported to be a key control lever in companies with a flexible culture (Heinicke *et al.*, 2016), are a set of definitions for communicating core values, purpose, and direction within the organization (Simons, 1995). Boundary systems establish “*the acceptable domain of*

activity for organizational participants” (Simons, 1995: 39). These systems limit the opportunity-seeking behaviour of the employees considering the risk that should be avoided (Simons, 1995).

2.2. *Previous research in the interplay of the LOC and innovation*

Research until now has allowed us to perceive the importance of interactive control in facilitating internal and external information flows (Lopez-Valeiras *et al.*, 2016), in providing guidance for search, legitimacy to autonomous initiatives, and stimulus in low innovative companies (Bisbe and Otley, 2004), in providing open forums for debate (Bedford, 2015), and in helping the critical reflection in teams (Matsuo and Matsuo, 2017). Diagnostic control systems are credited with importance in the success of projects (Rezania *et al.*, 2016), a beneficial role in new product development (Müller-Stewens *et al.*, 2020), and even with providing space for necessary experimentation in the case of companies seeking to exploit existing markets and technological capabilities (Bedford, 2015). For the two remaining levers, boundary systems have been said to have a positive role (McCarthy and Gordon, 2011; Bedford, 2015) while belief systems have collected very little evidence.

Notwithstanding, a core feature of the framework is that the four levers work on the proposition that only by being used together is it possible to achieve control of the business strategy (Simons, 1995; Simons, 2000). Indeed, *“to be most effective in balancing innovation and efficiency, the LOC framework was envisaged to operate with the four levers working in combination”* (Chenhall and Moers, 2015: 7).

Previous research supports the importance of the combined use of the four levers and has gone beyond analysing them in isolation (e.g.: Hoque and Chia, 2012; Bedford, 2015; Curtis and Sweeney, 2017; Baird *et al.*, 2019; Zarzycka *et al.*, 2019). Hoque and Chia’s (2012) findings suggest that all the levers work together to help the organization achieve effectiveness. Widener (2007) concludes about the complementarity and interdependence of controls in the LOC framework, with interactive systems influencing both boundary and diagnostic systems, and belief systems influencing the other three systems. Supporting this idea of joint operation amongst the levers, Tuomela (2005) concludes that PMS can be used as both a diagnostic and an interactive system, and that their use could

also have an impact on the belief and boundary systems. Mundy (2010) stresses the importance of using the four systems together to gain a broader understanding of the interaction between managers and MCS in the former's attempts to guide, direct, and control organizational activities. Speklé *et al.* (2017) also build on this idea of combined work and compute a measure of intensity on the use of the levers and find a positive effect of that measure with creativity.

In fact, the levers have specific features and ways of manifesting their presence in practice, and it is in their interdependencies, which warrant consideration, that relevant aspects reside. Similarly, the emphasis that managers put on the use of controls could be different depending on different circumstances. Kruis *et al.*'s (2016) empirical findings reveal different patterns of control whereby units place different emphasis on each of Simons' levers. This allowed the authors to conclude that balance can instead be achieved through various combinations of these levers.

Bellora-Bienengraber (2019) suggests that different emphasis is given to the levers within different degrees of innovativeness and the emerging product development strategy. Moreover, it has been found that interactive and diagnostic approaches are used to differing extents according to the stages of the organizational life cycle (Su *et al.*, 2017) or according to different innovation modes (Bedford, 2015). Guo *et al.* (2019) express their expectation that the relationship between MCS and innovation will be specific to the context. Ditillo (2004) suggests, as well, that MCS may vary amongst companies of different industries and between hierarchical levels. For instance, in this sense of variation, Aaltola (2018) found no presence of diagnostic controls in their case study. Indeed, the LOC framework can have different roles across different aspects of innovation and in integrating them (Chenhall and Moers, 2015).

Furthermore, in the realm of innovation, Curtis and Sweeney (2017) found strong mutual reinforcement between control systems, distinguishing between consistent reinforcement and countervailing reinforcement MCS, with the latter creating dynamic tensions. Tensions are a central and largely unexplored area. As expressed by van der Kolk *et al.* (2020), doubts remain about what tensions really entail and the processes that create them. Certainly, previous studies offer some evidence and research has continued to grow in recent years, especially in the LOC framework territory.

Mundy (2010) mentions that managers' efforts to balance interactive and diagnostic uses create dynamic tensions. In Henri's (2006) survey research it is concluded that the balanced use of interactive and diagnostic systems creates a dynamic tension that contributes in a positive way to innovativeness in highly uncertain environments and in cultures with flexible values. In the same line, Müller-Stewens *et al.* (2020) find that the combination of interactive and diagnostic uses complement each other and are positively related to both innovation rate and product newness. Dynamic tension may also be beneficial in organizations with contradictory strategic agendas or with pressures for creativity, flexibility, and change, (Bedford, 2015) and attention should be given to both diagnostic and interactive uses of MCS in each stage of the organizational life cycle (Su *et al.*, 2017). Zarzycka *et al.* (2019) reveal through a case study in management accounting services that Simons' levers are mutually reinforcing, having found that all levers give support to the others to achieve their aims. Baird *et al.* (2019) explore the impact of the enabling (interactive and belief) and constraining (diagnostic and boundary) levers, determining that they facilitate an active environment in which management innovation can be developed.

In turn, van der Kolk *et al.* (2020) provide conceptual clarification on the notion of tensions, identify them as "*being relations that can involve positive (complementarity) effects simultaneously (tension complexity) and can change over time (tension dynamics)*" (van der Kolk *et al.*, 2020: 2). Furthermore, the authors propose three key characteristics to mark a tension between elements: balance, balance tendency, and intensity. The first is the relative presence of the elements that constitute the tension. The second characteristic is the oscillation of the tension over the time. The third, as the name suggests, is the strength of the elements that are in the tension being analysed.

In sum, given this background of literature, in which different solutions, emphases, uses of systems in practice could surface, and interrelations could appear, the current study turns to an innovative industrial company in order to explore: (1) the extent and nature of the use of controls according to the LOC framework; and (2) how these controls work together to address the relationships and tensions amongst Simons' levers. In this way, it is possible to analyse the interrelationships that may exist between the levers, and how they work and engage with one another, making use of the conceptual developments advanced by van der Kolk *et al.* (2020).

3. Research Methods

3.1. Research approach

Yin (2018) clarifies that the case study is an appropriate method for “How” and “Why” research questions, allowing the researcher to understand holistically complex social phenomena. With this in mind, an in-depth single case study approach was followed to understand the nature and extent of MCS use according to the LOC framework in an innovative company and how they work together. The case site for this study is Amorim Cork Composites, an industrial company dedicated to the production of granulates and agglomerates of cork for a variety of applications.

Scapens (2008) points out that the selection of case studies should be made in such a way that the researcher can focus on the research questions to be addressed. In this sense, the case firm gathers two important characteristics for the purposes of this study. First, it has a strong culture and history of innovation. The company is today considered the innovative branch of a larger Portuguese group with an agenda and strategy very connected to innovation. Also, the case company is constantly engaging in product development projects, and at the moment of the study had several ongoing projects. In second place, the case company has a well-known orientation to results supported by the use of performance measurement and control practices based on a BSC methodology in continual use since approximately 2003. The use of the BSC at the company has been previously studied by Ferreira (2010).

3.2. Data Collection and analysis

Yin (2018) mentions that evidence in case studies can come from multiple sources. By means of triangulation, whenever possible, multiple sources of evidence were used in two phases between November 2015 and September 2016. Also, this use of multiple sources obtains richness in descriptions and explanations and a more in-depth understanding of what really is going on in the field.

First, a pilot study was conducted with the goal of gaining insights and a basic understanding of the company, especially in their management control practices and innovation processes. An initial interview was done to present the project and to clarify practical aspects of the work to be developed. Five interviews were done thereafter with key collaborators in the area of management control and innovation to obtain an early understanding of the company and update the information coming from a previous study undertaken in the same company (see Table A1 for a list of the interviews conducted – Appendix 1). Although prepared in advance with a set of questions/themes, a free approach was followed that allowed pursuing new issues and ideas as they emerged (Scapens, 2008). Also, visits including guided tours to the facilities and the observation of the an alignment meeting in the company were conducted (see Table A2 for a list of the visits – Appendix 1). These visits to the showroom and production facilities provided a better understanding of the production processes, the raw materials qualities and potentialities, the products, etc.

After this first phase, lines of inquiry and the full range of employees to interview were established. As they are especially helpful to obtain explanations for events and the perspective of participants (Yin, 2018), interviews were our main source of evidence, and 26 more interviews were conducted (see Table A2 for a list of the interviews – Appendix 1). To triangulate the insights collected and to include the perspective of as many levers of management involved in the PMS as possible, we decided to interview collaborators from all of the departments. In addition to interviewing all of the department heads (except one) in these 26 interviews, in the case of the departments having more than five employees, two more employees in the second line of management were chosen. In the specific case of the production department, which includes most of the employees in the company, all of the second-line managers were interviewed (see in Figure 1 the organizational chart of the company). These interviews covered topics related to the control practices in place, their use, the company's positioning toward innovation, and processes of innovation.

In the end a total of 32 interviews were conducted, with an average duration of one hour. Except for the first one, all interviews were recorded and then transcribed for further analysis. In the visits made to the company, since recording was not feasible, notes were taken and extensive reports were written soon thereafter.

The data collected in the interviews in both phases were complemented with internal documents of the case company. In addition to the publicly available documentation, throughout the whole period we were given access to internal information such as internal reports, organizational charts, PowerPoint presentations of the strategic map, information about the goals to achieve and their evaluation measures, employee performance evaluation examples, and examples of monthly reports of results.

Concerning data analysis, with the help of the qualitative software package MAXQDA 12 the transcripts were searched and marked, grouping similar thoughts that allowed the identifications of Simons' levers (diagnostic, interactive, belief, and boundary systems) and how the case company MCS were being mobilized. Data were analysed according to operational definitions of these levers, which had been previously delineated based on previous studies or theoretical references about Simons' levers and in examples that they provide. This allowed the coding process to progress in a consistent way throughout the interviews (Miles *et al.*, 2014). During this process it was possible to start understanding how the systems were working together and what they possibly represented to innovation.

4. Setting the scene

4.1. A glimpse of the company and its attitude toward innovation

With the base of its operations centralized in Portugal, ACC is a company integrated within a major cork group that has a worldwide presence and different business units. ACC is one of these business units and has as main activities the production of granulates and agglomerates of cork and cork with rubber, as well as their subsequent commercialization. This commercialization may be in the form of the granulates, agglomerates, or by further transforming these into a wide range of products. The granulates and agglomerates produced have thermic, acoustic, sealant, aesthetic, and insulation qualities that allow the subsequent production of numerous products. For example, these agglomerates may be used as components for footwear, bulletin boards, home accessories, joint seals for cars, transformers, expansion joints, anti-vibrators for trains, and thermal and acoustic insulation for floors, among other products. Regarding its products, a document collected in the company website mentions:

Internationally renowned for its R&D credentials, the company's pioneering spirit – coupled with cork's unique properties – has made it possible to deliver a remarkable range of high-performance, state-of-the-art products. (ACC website)

As noted in the passage, ACC is renowned for its innovativeness. Indeed, innovation is of paramount importance and is perceived as crucial to enhance the potentialities of its raw material, cork. This attitude and posture have made ACC the most innovative business unit of the group and the starting point of most innovation projects, as noted in this remark:

(...) the quantity of new applications that come out, the reinvention of products and their applications leave from here [The company]. (Head of Innovation)

The same interviewee continues:

If there is innovation in the group, it is here that you find it for sure.

Another illustration of the company's innovative commitment is this excerpt from the description of this business unit in the group's annual report for 2015:

The launch of new products on the market and the development of new applications, two central goals of the BU's strategy, also made an important contribution to sales growth as well as helping to create value in the market. (Holding 2015 report)

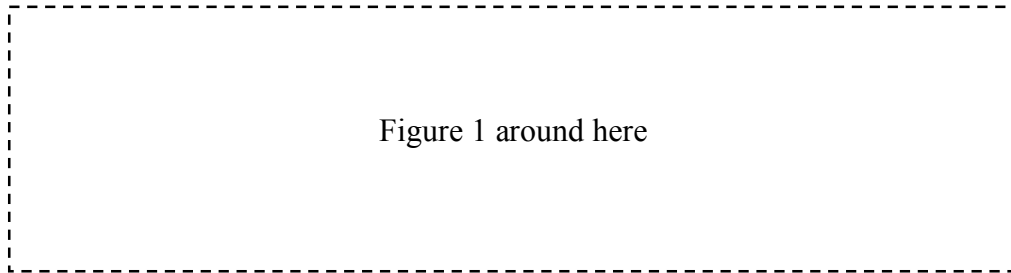
Therefore, the company also has a strategy with innovation as a core element:

[Speaking about the company ambitions] *And, then the turnover and, also, the component of new products, new applications, new turnover and its weight. These are the big three, the big three objectives or the big three goals that we are going to use as a beacon. (Head of management control)*

Also, a signal of the importance of this focus on innovation, shortly before the beginning of this work, an internal restructuring of the company introduced a greater alignment of innovation activities and a better use of resources to develop new solutions more quickly. These changes led to the creation of a specific department dedicated to innovation. Figure 1 presents the organizational chart at the time of data collection.

Along with the structural change the company implemented an innovation system based on a stage gate approach. The model is a classic stage gate with decision gates that compartmentalize the entire process and allow for monitoring the projects under development. At each gate decisions are made by the management team, while the projects are guided by a manager who works together with a multidisciplinary team of

internal elements of the company. This implementation also signalled to the workforce the importance of innovation.



4.2. ACC's Management Control Practices

Regarding management control practices, the company has maintained some stability over time (e.g., Ferreira, 2010; the author analysed the BSC model in this company). The main visible feature of the case company's management control practices is still a well-structured and fully integrated PMS. By indication of the holding, since 2003 the business unit has utilized a BSC methodology that now has a well defined cycle and is in a very mature state (Ferreira, 2010). At the end of each year a review is conducted of the strategic objectives and a strategy map is prepared with the normal four BSC perspectives and guidelines that make a double input matrix forming the map. Having a three-year window (for the period 2016-2018) the strategic map comprehends three strategic guidelines: growth, value, and efficiency. For this period, a total of 23 objectives could be counted and are divided between the perspectives of the BSC and the strategic guidelines. In the strategy map the causal relationships are also presented. Notwithstanding, a set of indicators, strategic initiatives, the persons responsible for the strategic objectives, and the initiatives, milestones, resources needed, and actions to be taken during the following year, are considered and established. Then, a strategic scorecard is designed for the business unit itself and for each of the strategic guidelines. The strategic objectives, strategy map, and initiatives are then communicated throughout the organization with some alignment sessions.

Moving beyond the corporate level, these strategic objectives are decentralized to all of those involved in the system by individual contracts of objectives. The drill down process of the objectives is done in a top-down perspective so that all of these contracts are

chained amongst the various hierarchical levels of the organization. Usually these contracts consist of five or six objectives agreed upon by the department head and each collaborator. The contract between each manager and collaborator is then finalized and the weighting of each objective is negotiated for the final evaluation computation that is used in the company's incentive system.

Apart from some very specific uses, such as the planning of raw material consumption, the company disregards budgeting practices.

The importance that the company gives to innovation is visible throughout the BSC system. While the company has a serious commitment to deliver remuneration on invested capital, which is emphasized in the strategy map, it is clearly in the minds of all employees that innovation is the North Star. Furthermore, the model also incorporates measures and objectives related to innovation that then end up in the individual contracts created, even though this effort is not divided (or subdivided) equally amongst all those involved. Some persons end up with more responsibility in this than others. As expected, the person responsible for the innovation department has an individual-objectives contract that is more centred on the strategic objectives related to this area, but since new product development is very market oriented, salespersons of the various sales departments themselves have in their individual-objectives contracts goals of sales for new products.

It is one of the goals that the segment managers have. Development of new products. Then the objective is based on the number of products that are developed and their sales volume. (Head of the Global Segment Management and Business Development Department)

This feature thus reinforces the attention of the sales team on the sale of new products already developed and on paying constant attention to the search for new ideas. A similar idea applies as well to the global segment management and business development department.

5. The levers at the case company

5.1. Diagnostic use of MCS

With the practices clarified earlier it was perceived that managers used the BSC model in a diagnostic way, but also in an interactive way. Diagnostically, the strategic scorecard is used for the basic functions of tracking the achievement of the established objectives and the analysis of indicators seen to be fundamental for the accomplishment of the strategy. Consequently, there is a formal routine that allows the management control department to undertake a monthly monitoring of all company objectives as well as those of the individual-objectives contracts. This monitoring is then communicated to all those who intervene in the system through a software created for the company that automatically sends reports to those evaluated and to their respective superiors. This process and the extension of the analysis is evident in several of the interviews conducted:

(...) Then the monitoring, which is monthly, is done in this software. And, this software automatically sends, when the monitoring is closed, an email with the monitoring in pdf format to the people, to the person in charge and to his/her superiors, and to other people that can be parameterized in the system. (...) They have the details, and why they have reached or not [the objectives]. Both the boss and the collaborator. (Head of management control)

Therefore, we, on a monthly basis, always look at this [BSC] and see what is better and what is worse. To deepen, too, to correct ourselves by changing what is needed. (CEO)

Associated with this tracking process, the company also has an incentive system for all of those that have an individual-objectives contract. As mentioned by Simons (2000), extrinsic motivation in the form of bonuses and incentives can be made contingent upon performance reported in diagnostic control systems. In the case company a financial bonus is awarded according to some predefined stages of achievement of the objectives.

The monitoring process analysed above is quite extensive and detailed, and later serves as the basis for monthly meetings held between the managers of this business unit and the managers of the holding.

But monitoring is just the trigger of a discussion process and it is the basis for us to define our strategic or more operational guidelines. (Head of Human Resources)

After the close of the monitoring process the executive committee have a period of a few days to ask questions about any of the results presented. These questions are often

forwarded to the various departments, which have a few more days to respond. This process is explained by the person in charge of management control:

[The monitoring report] is sent to the board of directors and the executive board who, traditionally, have two business days to ask questions. Therefore, they read the folder, the documents and say: I did not realize this, I did not quite understand that. Or, it may not be a matter of not realizing it, it may be a matter of: I would like to approach and drill down a bit of this. (...) We internally distribute these issues and find who is responsible for answering these questions.

From here, interactive control processes start to be perceived in which the managers guide the rest of the organization to search for new opportunities by focusing on strategic uncertainties (Simons, 2000).

5.2. *Interactive use of MCS*

Although it cannot be separated from diagnostic control in the sense that it also reveals tracking the progress, the search for dialogue that ends up arising from the questioning phase shows signs of interactive control. Managers encourage the subordinates of various hierarchical levels to engage in searching, analysing, and discussing the monthly information (Simons, 2000), which helps to improve the present plans or the strategy. The procedure therefore represents a form of involvement of the top managers with the subordinates and a form of exchanging information. Internal communication and involvement are promoted while the meetings become more productive about the strategic reflection, the actions, the measures necessary to consider in light of the results obtained, and the uncertainties regarding the achievement of the intended strategy. As posed by the head of management control:

(...) This was a great gain, indeed, in the dynamic of the process. In addition to all the involvement it brought from all executive direction.

Also, the managers pay constant attention to the information produced by the system. At the case company the monthly meetings conducted within the top management and managers of the holding represent a moment of exchange that can be understood as interactive control. In addition to serving as an opportunity to analyse the monitored results, these monthly meetings are also used to examine the specific state of each strategic guideline and the implications. The strategic themes are discussed at these meetings, and as Ferreira (2010) mentions, the managers at the company end up using the

BSC to bring up new plans and strategic initiatives. Therefore, with this positioning the managers have face-to-face discussions, challenging what has been achieved and what the strategic uncertainties are that the future will bring, with a facilitating, inspirational, and intensive involvement of all the top management. These are essential properties according to Bisbe *et al.* (2007).

Thereafter, additional time is spent in the various departments to discuss and interpret the results of regular monitoring, which is another signal of an intensive use by middle managers.

Monthly, all sales managers hold meetings with their teams to measure gaps and to see what action is taken to ensure that goals are met. The same goes for the marketing and segment management teams. (Head of the global segment management and business development department)

The department holds monthly meetings (...) about the measurement of the objectives with the data that we obtain from the management control. We have a monthly meeting, and see if there are deviations in the fulfilment of certain types of indicator, which can be done to reverse some negative trend, and act in consonance. (Project manager)

There is also a participatory process regarding innovation. As reported by the head of the innovation department, the company has established a committee in which the projects, decisions, and aspects related to innovation are discussed:

Then, we have the governance of the innovation system that is done by a committee. The innovation executive committee (...) all that has to do with project status, with innovation initiatives, is discussed and approved in this executive committee of innovation, where the administration of the company of all the areas is.

Another signal of the participatory process is also the projects teams that are assigned by the executive committee and that engage collaborators from various departments in the development of that project:

And then, we have all the projects that are done, they are multidisciplinary projects and, therefore, they have transversal teams in the organization that are appointed in executive direction, by the executive committee. They are part of the project, with a project leader and then this transversal team is managed in the organization. (Head of Innovation)

In sum, there is a clear involvement of top management around the pillars of strategy, and innovation is given a primary focus of discussion and debate. This debate is not restricted to the executive management, since more moments exist for innovation issues with a more open internal population, especially amongst the sales, innovation, and global segment

management teams. These processes thus fall into the category of what is meant by “interactive control”.

5.3. *Boundary and Belief systems*

It is also possible to identify the presence of elements comprehended in what is classified as boundary and belief systems. In the case company these systems are used to communicate and promote the involvement of the organization with innovation. It is well established that the company’s strategy is founded on innovation. The mission, short and simple, makes it clear that what is wanted is to promote an attitude oriented to new developments. In the core values of the company “innovation and creativity” clearly indicate what the company stands for. There is also a set of mottos constantly repeated by the entire population of the organization. As an example, an institutional PowerPoint presentation of general information about the company has as heading the following expression:

Together toward innovation

Another example comes from the expression that is the beginning of the company’s presentation taken from its website:

Innovation is our attitude and driving force

This innovation message is also communicated in some elements of the MCS and other internal documents:

(...) We have, for example, a commercial manual in which in the first chapter it has the strategic positioning of the company, and in which X% of the growth in the triennium must result from innovative products. New products. (Head of Human Resources)

We, in the strategy map say that we want to have a certain sales volume, but that we also want to have new products, and that we also want to have priority segments. (Head of management control)

Then, there is the boundary system. By definition, the company’s boundary system encapsulates acceptable activities. Although elements could be found here and there at the case company, they were less visible. The boundaries of strategic action are communicated through the principles and pillars of the strategy, giving guidance on

various aspects such as financial performance and market positioning. This finding is also present in the study developed by Ferreira (2010).

Also, in relation to innovation, the model gives some guidance on the field to which the development effort should be directed. In this sense, the person responsible for innovation also spoke about the determination of the challenges within each strategic segment. This represents a way of guiding the innovation effort and ensures that it also acts as a domain of acceptable activities.

(...) What are the areas of strategic challenges for innovation in all these segments that are important for the company? We are now finishing this process of clarification to give us clues. Then we have to go after concepts and begin to develop.

These limits are then more specifically materialized in the stage gate system. The “go” or “no go” to the next phase is given with decision makers having in mind these defined limits. For example, in the first decision gate the ideas are set in a referential based on these limits, which will indicate if it is worth continuing the development or not:

Then we have here a way to measure which projects fall into this definition [strategic alignment]. And it is the entry point of all the value propositions we have developed. (...) They will be classified in these referentials so that we can give a sense of priority to develop. (Head of innovation)

Simons (2000) states that a set of prescriptions and rules must be linked to a credible degree of punishment. In the case company it cannot be strictly stated that there is a punishment for misbehaviour, although it is implicit that failure to meet the objectives of individual contracts will mean that the annual incentive bonus will not be awarded. Innovation objectives are included in some of the contracts, so not achieving these objectives could jeopardize an end-of-year bonus.

In Summary, Table 1 presents the main visible features of the control practices according to Simons’ levers.

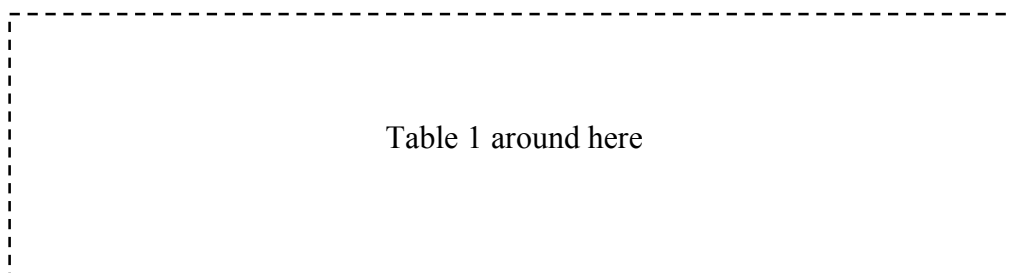


Table 1 around here

5.4. *The combined use of the four systems*

As expected, at the case company the four levers end up acting in combination and it is in their combined work that innovation can coexist with innovation. On the one hand, all the dialogue, debate, and discussion promoted by the interactive use of control systems (as discussed in the previous section) create the necessary forums to generate ideas.

We perceive the trends, we perceive how the market is evolving. And then we try in advance to develop products that are likely to be used in that segment of activity. (Head of the global segment management department and business development)

Indeed, this represents a positive and inspirational force that ties all the organization around the innovation issues, giving way to the emergence of new products and/or new applications of existing ones. However, this emergence promoted by interactive use of MCS is counterbalanced by the diagnostic uses of MCS and the boundary control systems. They come into play to guarantee the alignment with the strategy and objectives of the company:

It is good that the company has implemented a set of processes that ensures that we have, on the one hand, processes of attracting opportunities and ideas. (...) but, we have to leave some opportunities behind (...) for opportunities that we perceived to be more oriented with the strategic alignment of the company and to be more attractive. (CEO)

Innovation is a panoply and a very large field. We cannot say: look, let's innovate! Let's innovate! We need to have a strategy. We need to know what it is that we want to innovate. Which way do we want to go? What alternatives do we want to explore? And the best way to do this is with a contract of objectives. (Head of Production)

The use of systems in both diagnostic and interactive ways also signals the importance of the profitability of new developments.

(...) The focus of the organization is that being new is not enough. Only innovate is not enough. We must innovate and bring in two very important components: One, we have to bring value. We must innovate and bring value. And, bring sales volume. (Global Segment Manager)

This need of profitability is important to the case company considering their past, in which new products appeared but most were unable to generate sales. The use of the BSC in a diagnostic way reinforces the need for new developments to be able to generate value and sales. The setting of sales targets of the new products developed on the various teams

involved in the innovation processes ends up ensuring this. This was commented on by the projects' managers:

If I have a sales goal it means that I will do the development thinking that has to be really developed and I will not simply deliver a report that will be the best possible. (...) It is an objective [the sales objective] that really has a more concrete way of measuring and that has an impact on the objectives of the company. Because, in practice, the company does not only want to do projects. (Project Manager 1)

It makes sense that the objectives cover a real value associated with the product whose clear objective is to put it on the market and make sales and results. (Project Manager 2)

Also, through the monthly monitoring that is done on the achievement of these sales objectives there is a constant reminder of the need to generate sales volume in the new developments. These two concerns regarding the innovation effort and the need for profitability of the new developments are also present in the objectives of sales of new products in the Innovation department and the Global Segment Management and Business Development department. Although sales are not in the hands of these employees, this objective once again reinforces that these departments must maintain an innovation flow:

(...) And if we have as one of our goals to have X% of the sales volume in new products, there must necessarily be this permanent concern. Add products to the portfolio, create new products, find new products for new applications, replicate best practices... (Head of the global segment management department and business development)

In both cases we should keep in mind that monitoring is linked to an incentive system that rewards the accomplishment of these objectives. Furthermore, internal management control also monitors a set of indicators that are considered necessary for the attainment of these goals, and the strategy map very clearly indicates that the primary purpose of the company is to create value for the capital invested.

However, to guarantee the profitability of the new developments, the company also uses its stage gate system. As reported by Jørgensen and Messner (2010), the stage gate process also plays a role in calling the attention of project managers and their teammates to product profitability. Throughout the various decision gates, expected costs, market potential, and other metrics of interest are considered, which allows assessing the return and size of the potential businesses for the product that is being developed.

Another thing here [the projects in the pipeline] is the strategic alignment of the projects. Here are the segments that are strategic for ACC. It is one of the ways of

screening when a value proposition arrives (...), we see if business potential is gathered, capacity, strategic alignment ... and, we have a set of terms defined that we cross with product management. (Head of innovation)

When talking about the set of projects under development, the head of innovation points out another important concern in the above comment: the need to align the new developments to the strategic alignment of the company by considering the strategic segments defined. These strategic segments are framed within the boundary system and are reflected in the stage gate model, in which they end up as screening criteria.

Subsequently, elements of belief systems come into play:

Usually at meetings, we always talk about goals and performances. And so, it is not possible not to talk about innovative products. We give them a lot of importance ... We always talk about it. In every communication, we talk about it. (CEO)

Hence, belief systems help to maintain awareness and adherence to the core values, thereby supporting and complementing the work done by the interactive system.

6. Discussion and concluding remarks

Depending on the needs of each organization, managers choose the control tools to be used. Inevitably, these controls end up working together, meaning that they do not work in isolation, but instead complement one another. It is therefore not unexpected that the balancing of Simons' levers of control differ from one organization to another. This case study report has sought to describe how managers mobilize the MCS at their disposal through the lens of Simons' levers of control framework. From the data collected it is seen that ACC uses a BSC model, a stage-gate model, meetings, mission, value statements, and internal communications to mobilize the levers of control.

The control environment of the case company suggest that all levers should be involved in the management of innovation and that each, and all collectively, have a role to play. Signs of all the Simons' levers were found and these ended up working in combination. Diagnostic and boundary systems work closely with each other, providing the strategic direction for the innovation effort and reducing the uncertainty of results, while the inspirational forces of interactive and belief systems create the needed proactivity. Beliefs and interactive control work together and in a complementary way along with the complementarity work of boundaries and diagnostic control. The combined presence of

the Simons' levers demonstrates that consistent and countervailing reinforcement exists between them, according to the distinctions enunciated by Curtis and Sweeney (2017). At first, it is possible to perceive that the inspirational levers (interactive use of controls and belief systems) and the constraining levers (diagnostic use of controls and boundary systems) provide a consistent reinforcement within these pairs. This is consistent with the principle that guided Baird *et al.* (2019) to group these levers into enabling and constraining levers, respectively. This strengthens the argument that the levers mutually reinforce each other (e.g., Curtis and Sweeney, 2017; Bedford, 2015).

On the other hand, some signs of countervailing reinforcement also exist. With our results it is possible to point out that the combination of interactive/beliefs use of control systems and the combination of diagnostic/boundary use of control systems allows expanding the positive effects of the first group without jeopardizing benefits to the company. By drawing an analogy with a car, as did Simons (2000), the inspirational forces are the accelerator providing speed while the more constraining forces of the model are the steering wheel, which permits reaching the destination. Without this steering wheel, probably the inspirational forces would result in a deviation of attention from the more general objectives of the company. This may reveal the presence of countervailing reinforcement. As posed by Zarzycka *et al.* (2019), countervailing reinforcement occurs when levers that provide constraints are combined with levers that push employees' creative thinking toward new solutions.

This push in different directions causes tensions to emerge. Building on van der Kolk *et al.*'s (2020) conceptual developments, the results make it possible to perceive the complexity attributed to tensions by these authors, who point that competing and complementary forces may exist simultaneously. This is what our findings point to, as described above. Controls used according to LOC both complement and compete to guarantee a flow of product innovations while profitability and alignment are achieved.

Likewise, it is possible to analyse the presence of two of the characteristics they enunciate: balance and intensity².

Regarding balance, it is possible to see from our findings that the presence of control systems mobilized diagnostically and interactively are stronger, while those mobilized by beliefs and boundary systems are weaker. Regarding intensity, the case shows that the intensity of use differs depending on the lever analysed. Boundary systems are less emphasized than the others (lower intensity), with diagnostic and interactive systems having a greater intensity of use. Nevertheless, a solution is still achieved despite the different emphases and is effective in the case context. Moreover, in line with Kruis *et al.* (2016), it is not implicated that each lever is used to the same extent as the others. The levers can be used in differing degree. However, in opposition to van der Kolk *et al.* (2020), our results seem to point that organizations can have control practices and systems implemented and running that do require managers to make conscious and active alterations to the intensity of use of one control element over another. The control environment can have specific moments at which it is normal that the intensity of certain control elements manifest more than others, while overall they are able to remain intertwined.

Furthermore, these uses of control show that it is possible to have structured control processes that do not hinder the innovation effort, while at the same time allowing management to better exploit them. Aligning with the conclusions of Speklé *et al.* (2017) in relation to creativity and control, our grounded study shows that managers do not need to make a trade-off between innovation and control. Structured control systems can ensure the strategic fulfilment of the objectives to which an organization commits without needing to sacrifice innovation. Indeed, the negative forces do not constrain innovation acting in the bottom line in reducing the uncertainty of the innovation results. This reinforces the importance of this role of control, which Akroyd and Maguire (2011) had already revealed in the specific case of innovation projects. Also, ACC reveals a greater use of feedback and measurement systems. Curtis and Sweeney (2017) attributes a

² Balance tendency is not possible to analyze given the nature of the data collected. The present case study is unable to capture the oscillations of the tensions over time.

protective role of feedback and measurement systems to innovation, which is endorsed by the role they perform in the alignment of innovation with the strategy and the proactivity they cause among the company's collaborators.

The case study findings also show some signs of a way of managing the control problem mentioned in the study of Bellora-Bienengräber (2019). The author speaks about two control demands that conflict with each other in the product development function: the need for opportunity-seeking and creativity and the need to avoid risk-seeking that can ultimately endanger goal achievement. At a firm level this conflict seems to appear in the case company and the combined use of levers identified ends up addressing it.

With this background in mind, the present study contributes to both literature and practice. Although a growing number of studies have accumulated in the literature about management control and innovation, the need remains to dig deeper into the control practices to extend our knowledge about innovation processes (Major *et al.*, 2018) – especially on how control systems can relate to innovation in a joint way and how tensions are enacted and managed between control and innovation.

First, the results of this study allow us to dig into the inner workings of the levers of control, bringing into the discussion the recent work of by Kolk *et al.* (2020). Indeed, consistent reinforcement within the inspirational and constraining levers creates, as expected, a push in different directions (as Curtis and Sweeney (2017) showed), followed by countervailing reinforcement that also seems to be present. This may create tensions in a two-dimensional relationship as explained by van der Kolk *et al.* (2020), with signs of competition and complementary effects. Although the levers are all present, different relative presences (balance characteristic) are seen and controls within these levers are used with different intensities.

Second, and in parallel, the theoretical framework and methodological approach followed in this study has allowed us to shed light on the simultaneous use of different control practices. For quite some time the management accounting and control literature has recognized the need to not look at systems in isolation (e.g., Malmi and Brown, 2008; Ferreira and Otley, 2009; Grabner and Moers, 2013). The case study of ACC provides evidence on how managers mobilize the MCS at their disposal to maintain a strong strategic emphasis on innovation in the specific context of an industrial company. As

mentioned in the first paragraph of this discussion, a range of practices were found and described in the findings.

Third, as the results show signs of the presence of all the levers of control, it is possible to contribute to the literature by showing how a controlled environment may still be innovation friendly. Similarly, this study allows us to better understand how organizations can manage and maintain innovation within their control practices using useful systems. This case study can give practitioners insights regarding the design and use of MCS in companies that have a strategy strongly oriented to innovation.

These contributions respond to several calls to dig into these matters of the role of control in innovation (e.g., Moll, 2015; Fried, 2017; Major *et al.*, 2018; Baird *et al.*, 2019) and to address this line of research through qualitative approaches that enrich the debate (e.g., Henri, 2006; Barros and Ferreira, 2019), and allow for the capturing of more finely-grained evidence.

Among these contributions, there are several possibilities for future research. First, since this study reports the example of only one company, generalization is restricted (Mundy, 2010; Miles *et al.*, 2014). Furthermore, different companies, sectors, and management styles may need to use different levers, and the choice of the way in which an MCS is used ultimately depends on the managers. As Simons (1991) suggested, there are fundamental differences in how managers use control systems. Thus, the literature would benefit greatly from more case studies and even multiple case studies. This is even truer if one takes into consideration the idea of Revellino and Mouritsen (2009) that innovation and controls are co-developed. Against this, it will be valuable to use longitudinal case study approaches to study the role of MCS in innovation, how tensions evolve over time, what strategies managers use to deal with them, and how they deal with their outcomes (see Löfstål and Jontoft (2017) for a review on tensions).

Appendix 1: List of interviewees, direct observations, and their duration

Table A1 and A2 around here

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Tables:

Practice

- Diagnostic**
- Objectives defined to keep track on progress;
 - Drill down of the strategic objectives to employees;
 - Establish routines to track progress monthly;
 - Incentive system attached to objective contracts;
-

- Interactive**
- Involvement and constant interactions between the hierarchical levers;
 - Regular meetings and moments to promote debate and discussion;
 - Regular debates between the top management and the managers of the holding to assess implication and, therefore, strategic uncertainties;
-

- Boundary**
- Communication of the strategic boundaries by the pillars of the strategy;
 - Limits could also be seen in the decision gates of the innovation model.
-

- Beliefs**
- Mission, core values and mottos around the company;
-

Table 1: Author's summary of the levers of control framework based on the one presented by Hoque and Chia (2012)

Responsibility area	Interviewee	Duration (Minutes)
First phase: Pilot case study		
Various	- Member of the Holding - Head of innovation department - Head of Management control	40
Finance	- Head of Management Control	95
	- Head of Management Control	52
	- Head of Management Control	32
	- Head of Management Control	77
R&D	- Head of innovation	65
Second phase: main case study		
CEO	- Chief Executive officer /Head of Europe sales department	60
Finance	- Chief Financial officer	60
	- Finance manager	55
Quality and environment	- Head of the department	46
Marketing	- Head of Marketing department	50
Human Resources	- Head of the department	73
R&D	- Head of Innovation department	55
	- Project Manager 1	59
	- Project Manager 2	53
	- Laboratory Manager	47
Global segment manager and business development	- Head of the department	80
	- Global segment manager	60
	- Global technical manager	62
Footwear department	- Head of Footwear department	80
Sales departments	- Head of Asia sales department	58
	- Segment Manager 1 - Europe	60
	- Segment manager 2 – North America	45

	- Segment Manager 3 – North America	37
	- Market developer 1 - Asia	68
	- Market developer 2 - Asia	50
Production	- Head of the department	43
	- Production responsible 1	65
	- Production responsible 2	70
	- Production responsible 3	45
	- Logistics Responsible	73
	- Maintenance Responsible	70
Total		1885

Table A1: List of interviewees and their duration

Direct Observations	Duration (minutes)	
1. Tour of the showroom	60	
2. Tour of the production facilities	130	
3. Alignment meeting with all the employees	60	
Total		250

Table A2: List of direct observations and their duration

Figures:



Figure 1: Company organizational chart (main departments)

Source: Company finance department