Conference Paper

Accounting Control Systems, Open Innovation and Sustainable Competitive Advantage

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Abstract

The purpose of the study is to study whether management accounting and control systems (MACS) and intellectual capital (IC) reflect the sustainability competitive advantage (SCA) of the companies concerned. Where a greater focus on open innovation occurs, it may require a different emphasis on management accounting practices compared to companies where they do not feature strongly. It is assumed to be important that management recognise and act on this in order to improve firms' sustainability competitive advantage. This study is expected to show that the level of open innovation (OI), as expected to be a major source of corporate competitive advantage, influences the practice of management accounting and control systems and intellectual capital. Whilst the literatures place considerable attention on (close) innovation purposes, far less attention has been given so far to the implications of open innovation for managerial accounting practice. This research addresses this omission. The methodology of this study is a literature review.

Keywords: open innovation, management accounting and control systems, intellectual capital, sustainable competitive advantage, pharmaceutical company.

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Received: 29 August 2018
Accepted: 18 September 2018
Published: 11 November 2018

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the ICOI-2018 Conference Committee.

1. Introduction

1.1. Background

In the old economy, to develop a sustainable competitive advantage (hereafter referred to as SCA) firms had a choice between three generic strategies in their attempts, namely cost leadership, market differentiation, and niche orientation (Porter 1985). In the new economy which is characterised by properties such as globalisation, intangibility, and inter-connectivity, pharmacy business organisations are required to face new challenges (Coyle 1999; Kelly 1998) and clearly understand the changing nature of competition and adopt complementary and/or supplementary strategic approaches (Hitt & DeNisi 2003).

One popular approach used to understand competitive dynamics is the resource-based view (hereafter referred to as RBV) of the firm. According to this view, only those resources that are valuable, rare, hard to imitate, and cannot be substituted provide a sustainable competitive advantage (hereafter referred to as SCA) ([2]; Barney 1995; Ferdinand 1999; Hamel & Prahalad 1994; Michalisin, Smith & Kline 1997; Porter 1996; Teece, Pisano & Shuen 1997), leading to higher performance of the firm (Peteraf 1993).

The open innovation (OI) paradigm has been risen to high interest among scholars as a viable way for developing an efficient and effective innovation process (Chesbrough, 2003) to achieve the sustainable competitive advantage of company. Open innovation is 'the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively' (Chesbrough et al., 2006).

Open Innovation companies needed to combine internal research with external ideas and then needed to deploy those ideas both within their own business and also through other companies' businesses (Chesbrough, 2007). The management accounting and control systems (MACS) practice is predicted to be a useful framework to link these technical decisions to economic outcomes, it also has value in understanding how companies of all sizes can convert innovation potential into economic value. The economic value of an innovation remains latent until it is commercialized in some way, and the same innovation commercialized in two different ways will yield different returns (Chesbrough, 2007). Here, accounting and innovation managers must expand their perspectives to find an appropriate MACS practice to capture value from that innovation. If the managers fail to do so, these innovation will yield less value to the firm than they might have yielded otherwise. If others outside the firm uncover a better MACS practice, they may realize more value than would the firm that originally discovered the innovation.

MACS is a process to assure that resources are obtained and used effectively and efficiently to achieve the organization's objectives (Anthony, 1965). Simons (1995) views MACS as the way of senior managers to successfully implement their intended strategies and in conjunction with other forms of controls to achieve some goals [6]. Davila et al. (2009) support the view that with a more complex working environment, uncertainty, and changing aspects, MACS have to be flexible and informal. The use of MACS within open innovation is to create a mixture of the rigid behaviour that MACS provide with extensive communication and sense of freedom that opens innovation requires therefore achieve the sustainability competitive advantage.

Jackson, Hitt & DeNisi (2003) argue that in any competitive landscape, intangible resources are likely to produce a SCA. Intellectual capital (IC) is considered to be one of those resources. IC as the knowledge, skill, and technologies used to create a sustainable competitive advantage for companies (Edvinsson, 1999) and encompasses the access to and use of all employees' knowledge and applied experience, and the organizational structure, technology, and professional systems within a firm. These elements translate into competitive advantage and monetary gains (Gratton and Ghoshal, 2003). Open innovation is predicted to be enriching the company's intellectual capital through the integration of external knowledge sourcing, the latter to earning profits by bringing ideas to the market and selling intellectual property (Michelino and Cammarano, 2014).

This study the firms with high levels of OI have developed their management accounting practices to support OI and to what extend the OI increase the IC of company in achieving the company SCA. It is yet unclear what role management accounting plays in relation to SCA in OI companies. Based on the background analysis, the main issues of this research are: 1) Is there any relationship between open innovation and management accounting and control systems? 2) Is there any relationship between management accounting and control systems and sustainable competitive advantage? 3) Is there any relationship between open innovation and intellectual capital?

2. Literature Review

2.1. Management accounting and control systems

Management accounting control systems (MACS) are systems for influencing human behaviour within the organization [9, 12]. MACS is defined broadly as a system conveying useful information to help managers in decision-making process to achieve desired organisational goals efficiently and effectively (Anthony & Govindarajan 2001; [12, 15]). The definition of MACS embraces both formal and informal 'control package' (Otley, 1980, [15]). As a result, MACS involve both personal (Merchant 1985), clan control (Ouchi 1980) and performance measurement systems in general, combining both financial and non-financial information. Hansen and Mowen (2000, p. 825) define MACS as an information system that produces outputs using inputs and processes needed to achieve specific management objectives. MACS encompass the following areas: planning, budgeting, responsibility centres, cost management, decision-making, management control, performance measurement, and compensation (Anthony and Govindarajan, 2001).

MACS also have many characteristics which influence their use. For example, management controls may be formal or informal [12]. In any case, the presence, the use or absence of MACS significantly influences the actions and decisions carried out within an organisation (Anthony and Govindarajan, 2001). In this research, MACS are not defined by their technical design features. They are defined by how managers use these systems for decision-making process.

Simons (1995) differentiate the use of MACS into interactive and diagnostic system. The early empirical research on the diagnostic role showed that MACS can shape the organizational change in manufacturing industry (Burchell et al. 1980) and later research is on the interactive style of use of management control systems in the formulation and implementation of strategic change (Abernethy & Brownell, 1999) in the health services industry.

2.2. Open innovation (OI)

Open innovation means that companies should make much greater use of external ideas and technologies in their own business, while letting their unused ideas be used by other companies. This requires each company to open up its business model to let more external ideas and technology flow in from the outside and let more internal knowledge flow to the outside (Chesbrough, 2006). OI refers to the integration of suppliers, customers, and other external knowledge sources like the buying or licensing of patents; relates to benefitting from internal ideas by selling or revealing them to the market, such as selling intellectual property or multiplying technology; and encompasses co-creation with partners via alliances, cooperation, and joint ventures (Dahlander & Gann, 2010; Enkel, Gassmann, & Chesbrough, 2009; West & Bogers, 2014).

Many aspects of an OI strategy and its related business models are nowadays transparent and easily imitable by other companies, sometimes even 'shared' by multiple competitors (Teece, 2010). This means that organizations have to decide more carefully where to be 'open' and where to be 'closed' in order to maintain competitive advantage (Almirall & Casadesus-Masanell, 2010). While the ideas behind OI might not be universally accepted, practitioners subscribe to the concept and accept it and seem to see it as being relevant for practice and what they do.

OI strategies appeal to organizations because they promise lower costs for innovation, faster time to market and the possibility to share risks with external partners (Chesbrough, 2006). However, changing an organization toward an OI strategy can be

challenging because the OI principles are closely interwoven with organizational structure, culture, and history (Chiaroni, Chiesa, & Frattini, 2010; Gassmann, 2006; Wallin & Von Krogh, 2010). Moreover, research indicates that the cost of openness might sometimes exceed its benefits (Saebi & Foss, 2015). Scholars from both the accounting (Davila, Foster, & Oyon, 2009) and innovation (Gassmann, Enkel, & Chesbrough, 2010) domains emphasise the need to better understand the role of MACS indicators in the strategic context of OI practices. Our study adds to such understanding by exploring how managers in pharmaceutical company work with MACS to achieve SCA.

2.3. Intellectual capital (IC)

Brooking (1996) defined intellectual capital as the combination of market intellectual property, human capital and structure capital that functioning company from (a) the knowledge creation and the new innovation; (b) the application of knowledge in handling newest issues and increase manpower and the customer; (c) the packaging, processing, and transfer of knowledge; and (d) the acquisition of available knowledge that come from the research and learning. The researcher generally identified three main constructs of intellectual capital: human capital, structural capital, and customer capital [4].

2.4. Sustainable competitive advantage

According to Amit and Schoemaker (1993) the RBV considers firms as bundles of resources heterogeneously distributed across firms, and that resource differences remain over time. Barney (1991) stresses that resources that are valuable, rare, difficult to imitate, and, moreover, non-substitutable, almost certainly lead to the achievement of sustainable competitive advantage, that cannot be copied and adopted by competitors. Resources include different components that can be utilised to apply wealth-creating strategy. These might be: (a) specific physical assets, (b) organisational assets, (c) human resources, and (d) competencies (Eisenhardt and Martin, 2000).

Day (1994) argues that capabilities create a link between resources and allow their deployment. Moreover, dynamic organisational capabilities illustrate the ability of an organisation to implement repeatedly, or replicate, productive activities that encourage organisation's capacity to generate value through influencing the transformation

of inputs into outputs (Teece, Pisano and Shuen, 1997). *Market orientation*, *organisational learning*, *market responsiveness, entrepreneurship,* and *innovativeness* are recognised as primary capabilities to gain SCA and create market change. However, although each capability is capable to positively contribute, it is not sufficient to develop competitive advantage. *Market orientation* is regarded as a common way for satisfying market demand and originating superior value for customers. It is described as a complex of beliefs that evaluates long-lasting profit taking into great consideration firstly the customers' interests and secondly that of stakeholders'. Narver and Slater (1990) and Kohli and Jawoski (1990) discuss the importance of market orientation is clearly link it with business performance.

Hurley and Hunt (1998) argue that i*nnovativeness* is the firm's positive attitude toward new ideas, processes and products, and its focus on innovation. Moreover, they stress that innovative firms can easily gain competitive advantage and consequently achieve high levels of performance.

3. Methodology

In the field of research, the term method represents the specific approaches and procedures that the researcher systematically utilizes that are manifested in the research design, sampling design, data collection, data analysis, data interpretation, and so forth. This study use literature review as the methodology. The literature review represents a method because the literature reviewer chooses from an array of strategies and procedures for identifying, recording, understanding, meaning-making, and transmitting information pertinent to a topic of interest. Moreover, as asserted by Onwuegbuzie, Leech, and Collins (2011), conducting a literature review is equivalent to conducting a research study, with the information that the literature reviewer collects representing the data.

4. Discussions

This study aims is to answer questions: 1) Is there any relationship between open innovation and management accounting and control systems? 2) Is there any relationship between management accounting and control systems and sustainable competitive advantage? 3) Is there any relationship between open innovation and intellectual capital?

4.1. Is there any relationship between open innovation and management accounting and control systems?

The RBV research on innovation especially open innovation is based on the fundamental premise that organizational resources (tangible and intangible) and capabilities are taken to provide the input that in turn is combined and transformed by capabilities to produce innovative forms of SCA. The availability of financial resources can expand a firm's capacity to support its innovative activities (Lee et al., 2001; Delcanto & Gonzalez 1999; Harris & Trainor 1995), whereas the lack of financial funds may limit firm level innovation (Baysinger & Hoskisson, 1989; Teece & Pisano, 1994; Helfat, 1997). According to Transaction-costs Economics and Agency literature, internally (firm) generated funds are more conductive to R&D activities and investments than external funds primary because there exist information asymmetries between the firm and the external capital market (e.g., competitors get information on R&D projects, firm lose total control over their innovations).

Innovativeness refers to the notion of the organization's openness to new ideas, products and processes, and its orientation toward innovation (Hurley & Hult, 1998). Innovation is considered by many scholars and managers to be critical for firms to compete effectively in domestic and global markets, and one of the most important components of a firm's strategy (Hitt, Ireland, Camp, & Sexton, 2001). Firms that have a greater capacity to innovate are able to develop a competitive advantage, achieve corporate renewal and achieve higher levels of performance (Danneels, 2002; Hurley & Hult, 1998).

More recent research has shifted attention from tangible to intangible resources. Intangible assets may be more important from a strategic point of view, since they bring together more frequently the requirements necessary for producing sustainable advantage: to be valuable, rare and difficult to imitate and replace by competitors ([2]; Hitt et al., 2001b). For example, a high stock of qualified human capital with advanced technical skills, know-how in R&D projects, and risk taking propensity increases the probability of a firm to carry out innovative activities (Delcanto & Gonzalez 1999; Kessler & Chakrabarti, 1999; Song & Parry, 1997; Huiban & Bouhsina, 1998).

Open to external capabilities and resources would make similarly large, long-term investments in order to compete. Innovation is not only closed, centralized, internal R&D used anymore, by do anything, do everything internally, from tools and materials, to product design and manufacturing, to sales, service, and support but more openly

identifying and accessing external knowledge and technology to generating internal knowledge.

Open Innovation needed to combine internal research with external ideas and then deploy those ideas both within their own systems and also through other companies' systems. The key for these firms is to figure out what necessary missing pieces should be internally supplied and how to integrate both internal and external pieces together into systems and architectures. In this case, this study assume that MACS is a useful framework to link these technical decisions to economic outcomes. The effective use of MACS value in understanding how companies of all sizes can convert innovation potential into economic value.

The economic value of a technology remains latent until it is commercialized in some way, and the same innovation commercialized in two different ways will yield different returns. In some instances, an innovation can successfully employ MACS that already familiar to the firm. Other times, another company will have MACS that can make use of the innovation via licensing, and 'hires' the technology that it will in turn commercialize.

The use of MACS in open innovation expected to function as follows: 1) To articulate the *value proposition,* that is, the value created for users by the offering based on the innovation; 2) To identify a *market segment,* that is, the users to whom the innovation is useful and the purpose for which it will be used; 3) To define the structure of the firm's *value chain,* which is required to create and distribute the offering, and to determine the complementary assets needed to support the firm's position in this chain; 4) To specify the revenue generation mechanism for the firm, and estimate the *cost structure* and *target margins* of producing the offering, given the value proposition and value chain structure chosen to other firms, or through launching new ventures that exploit the technology in new business arenas.

4.2. Is there any relationship between management accounting and control systems and sustainable competitive advantage?

Simons (1995) posits in his *levers of control (LOC) framework* that management control system consists of four interrelated control system: beliefs (e.g., mission statement), boundary (e.g., code of conduct), diagnostic (e.g., budgets) and interactive (e.g., management involvement) systems. Within this framework, the concepts of diagnostic control systems and interactive control systems have been singled out for empirical study in prior research on publicly funded enterprises. For example, Abernethy & Brownell (1999) adopt Simons' *interactive/diagnostic* classification of management

control systems to capture how accounting can be used as a learning machine in the formulation and implementation of strategic change in hospitals. In this study, the *interactive and diagnostic* classification of use of management control systems is adopted as a vehicle for upper management echelons to orient their faculty toward a more collegial or managerial style of operation.

4.2.1. Belief and boundary systems of LOC

Even though lever of control framework acknowledges elements of the value system (i.e., the belief system and boundary systems) as important control mechanisms, it has mainly concentrated on formal controls (Collier, 2005). Contrary to lever of control literature, management research had earlier recognized the need to consider less formalized processes such as management and leadership styles (Mintzberg and Waters, 1982; Somech, 2006), team composition (Horwitz and Horwitz, 2007), and culture (Tushman and O'Reilly, 1997) on studies that examine innovation management. In addition, as recent effort have been developed in management accounting literature to view management controls as packages (Tuomela, 2005; Widener, 2007; [13]), it seems evident the need of considering the influence of cultural controls into lever of control framework (Berry et al. 2009).

4.2.2. Interactive use of control system

Interactive control systems are formal control systems used by managers to involve the subordinates in decision-making process, to debate on strategic uncertainties and to encourage dialogue between managers and lower level of management as well as among other organizational members ([16]; Simons, 2000). Bisbe and Otley, 2004) argue that interactive MACS provide the appropriate environment for top managers to offer guidance for organizational member to look for new innovation ideas, encourage peoples' action to look for new opportunities, and for top management to indicate which initiatives are legitimate to the organizational programs. Henri (2006:533) supports the functions of interactive use of MACS as stimulus for actions and guidance, arguing that of interactive use of MACS 'stimulates the development of new ideas: and "focus attention [...] by reflecting signals sent by top managers"'.

When MACS are used interactively, (i) the information generated is a recurrent and important agenda for top managers; (ii) frequent and regular attention is fostered

throughout the organization; (iii) data are discussed and interpreted among organizational members of different hierarchical levels; and (iv) continual challenge and debate occur concerning data, assumptions and action plans.

Bruining et al. (2004) suggest that an important aspect of interactive control system is of providing firms with the strategic flexibility to adapt and evolve in changing environments through the development of its absorptive capacity (Zahra and George, 2002). Henri (2006) suggest that performance measurement systems used in an interactive (diagnostic) fashion contribute positively (negatively) to the deployment of specific capabilities, namely, market orientation, entrepreneurship, innovativeness. However, it challenges, to a certain extent, research that suggests interactive MACS is not always used by top managers to favour open innovation, but it can constrain innovation in specific firms that follow certain innovation strategies [3].

4.2.3. Diagnostic use of MACS

The diagnostic use of MACS represents the traditional feedback role as MCS are used on an exception basis to monitor and reward the achievement of pre-established goals based on programmed cybernetic processes (i.e., setting standards, measuring, analysis, and taking corrective actions) and on management by exception. Following a traditional mechanistic notion of control, a diagnostic use provides motivation and direction to achieve goals by focusing on and correcting deviations from pre-set standards of performance.

According to Simons (1994, 1995, 2000) these systems are limit the chances of deviation from pre-set outcomes/behaviours, monitor and reward achievement of pre-specific goals through the review of key performance or key success factors. A diagnostic use of management accounting control systems tends to negatively influence certain organizational capabilities such as market orientation, entrepreneurship, innovativeness and organizational learning [11].

Diagnostic use of MACS limit the innovative solution and the identification of the opportunity because too much focus on the pre-determined factors. This is different with interactive use which push the search for the innovative solution and learning through interaction, discussions and dialogue between managers and subordinated concerning the identification and monitor the threat and opportunity informally as well as focusing in the co-operation and communication (Agbejule, 2006).

4.3. Is there any relationship between open innovation and intellectual capital?

In a world of powerful forces that rapidly disseminates useful knowledge, the mind-set toward Intangible assets changes greatly. One implication of Open Innovation is that companies must increase the 'metabolic rate' at which they access, digest, and utilize intellectual capital. Companies cannot treat their intellectual capital as static; they must treat it as fundamentally dynamic. A company cannot inventory innovation advances on the shelf, for the day when they may prove valuable. Open Innovation companies use licensing extensively to create and extend markets for their innovation. And the faster the innovation gets out of the lab, the sooner the researchers will learn new ways to apply, leverage, and integrate that technology into new offerings (Chesbrough, 2007).

Competitors often find ways of inventing around a firm's intellectual capital, which allows them to enter the market very quickly, even when the firm seeks to exclude rivals from using its ideas. The costs for moving too late are much greater than they are for moving too soon. If company err on the side of premature cannibalization, they lose some potential profit company might have been able to eke out otherwise. If company err on the side of delay, the costs are deeper and longer lasting. Company will lose market share and must confront stronger competitors, who now receive additional resources from company former customers Chesbrough, 2007).

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