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Comprendre les capacités dynamiques : la perspective des micro-fondations

Understanding Dynamic Capabilities: The Microfoundations Perspective

Entendiendo las Capacidades Dinámicas: la perspectiva de las microfundaciones

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Résumé de l'article

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ABSTRACT

This paper analyzes how spin-offs can contribute to the micro foundations of dynamic capabilities in rapidly growing SMEs. Building on a multi-case study, three functions of spin-offs are analyzed at a supra level: boundary spanning to sense opportunities, flexible organizing to seize them and ambidextrous orchestration to reconfigure them. At an infra level, dynamic managerial foundations include a repertoire of cognitive, managerial and social skills that both the parent company owner-managers and the spin-off entrepreneurs share. However, they leverage those skills differently in terms of scope, speed and depth, thus complementing each other at different stages of the spin-off process.

Keywords: Micro foundations, Multi-case study, Dynamic Capabilities, Spin-offs, SME

RÉSUMÉ

Ce papier analyse comment des essaimage peuvent contribuer à la micro fondation des capacités dynamiques dans les PME en croissance rapide. A partir de plusieurs études de cas, trois fonctions sont analysées à un niveau supra : l'expansion frontalière pour explorer des opportunités, l'organisation flexible pour les capter et l'orchestration ambidextre pour les reconfigurer. A un niveau infra, les capacités dynamiques managériales regroupent des compétences cognitives, managériales et sociales, partagées par les propriétaires-dirigeants et les entrepreneurs. Toutefois, ces acteurs mobilisent ces compétences différemment en termes de champ, de vitesse et de profondeur, se complétant ainsi à différentes étapes.

Mots-Clés : Micro fondations; Étude de cas multiple; Capacités dynamiques; Essaimage; PME

RESUMEN

Este artículo analiza como las empresas semillas pueden contribuir a la microfundación de capacidades dinámicas en las Pymes de rápido crecimiento. A partir de un estudio multicaseos, se analizan tres funciones de nivel superior: la exploración de oportunidades más allá de las fronteras de la empresa, la organización flexible para agarrarlas, y la orquestación ambidiestra para adaptarlas a su empresa. Al nivel inferior, las capacidades dinámicas abarcan competencias cognitivas, gerenciales y sociales, compartidas por los gerentes de la empresa madre y los empresarios de la semilla. Sin embargo, éstos movilizan dichas competencias de forma diferenciada en términos de ámbito, ritmo e intensidad, de tal forma que se complementen para cada etapa del proceso de emprendimiento derivado.

Palabras Clave: microfundación, estudio multicaseos, capacidades dinámicas, Empresas semillas, PYME

Corporate spin-offs are a consequence of rapid growth, resulting in the separation of assets and competencies that are not in line with those at the core (Teece, 1982; Ito1995). If a separatist view is prevalent on spin-offs, several authors (Itturiaga and Cruz, 2008, Sapienza, Parhankangas and Autio, 2004; Parhankangas and Arenius, 2003) have consistently demonstrated that voluntary and sponsored spin-offs can support rapid growth and complement assets in relation to core competencies. However, there is scant evidence on the role of spin-offs in developing complementary assets that are used both by the child and by the parent organization. Even if such inter-asset specificity is acknowledged as central (Christensen, 1996; Dierick and Cool, 1989; Teece, 1986), the management challenges related to its development are largely neglected (Stiglietz and Heine, 2007). The problem lies in the static and one-sided Resource Based-View (RBV) on spin-offs with an over-focus on generic characteristics of rent-generating resources at the expense of insight on the use of resources to create a competitive advantage (Sirmon *et al.*, 2011; Priem & Butler, 2001).

The Micro Foundation View (MFV) on capabilities offers a more promising ground to tackle this issue of managing asset complementarities that spin-offs may develop to sustain a competitive advantage. By inviting scholars to focus on individual action and interaction, several authors have redirected attention to the human bases of resources and capabilities (Foss, 2011; Abell, Felin and Foss, 2008; Felin and Hesterly, 2007; Teece, 2007; Gavetti, 2005). Indeed, to understand spin-offs as outbound strategies to complement assets (Itturiaga and Cruz, 2008, Sapienza, Parhankangas and Autio, 2004; Parhankangas and Arenius, 2003; Peteraf, 1993; Teece, 1982), we need to look at the lower order variables such as “strategic implementation” (Barney, 2001). This calls for an understanding of creativity and entrepreneurship, which imply micro-foundations (Alvarez and Barney, 2008).

This paper analyzes how spin-offs can contribute to the foundation of dynamic capabilities in the context of a rapidly growing SME. Taking an MFV with complementary frameworks (Teece, 2007; Adner and Helfat, 2003), we provide an empirical

demonstration with an in-depth multi-case study of 3 rapidly growing SME and 6 spin-offs. From a higher order (*supra*) perspective, we demonstrate three main functions of spin-offs in their contribution to the establishment of dynamic capabilities. Secondly, from a lower order (*infra*) perspective, we reveal the dynamic managerial foundations of spin-offs that include cognitive, managerial and social skills. The owner-manager of the parent company and the entrepreneur of the child company have a repertoire of cognitive, managerial and social skills (Adner and Helfat, 2003). However, they leverage those skills differently in terms of scope, speed and depth, thus complementing each other at different stages of the spin-off process. Throughout the process, the role of emotion is central for effective decision making on resource orchestration.

The paper is structured as follows. First, we develop the theoretical background from a double perspective: the developmental view on corporate spin-offs and the relevance of a micro-foundations approach to spin-offs. We then show the complementarity of Teece (2007) and Adner & Helfat (2003) models to develop our initial propositions in a two-level analytical framework (*supra* and *infra*). Third, we present our results by illustrating both *supra* and *infra* processes to the foundations of dynamic capabilities. Finally, we discuss our two main contributions with respect to the literature.

Theoretical Background

A DEVELOPMENTAL PERSPECTIVE ON SPIN-OFFS

Corporate spin-offs are processes by which employees leave their employers to create a new firm (Ito, 1995) based on property and ideas developed at their previous company (Wallin and Dahlstrand, 2006). They are an efficient way to transfer and develop existing know-how, thus resulting in new activities with higher growth and survival rates (Agarwal *et al.*, 2004; Dahlstrand, 1997a; 1997b). The traditional view on spin-offs is that they are organizational mechanisms to restructure and maintain strategic coherence (Burgelman, 1983). As the company grows, it expands its “productive opportunity sets” (Penrose, 1959); some opportunities may lead to diversification if opportunity cost is low (Foss, 1998) while others may be deemed too risky to pursue. In the latter case, it will release excess resources and competencies not compatible with its core business (Teece, 1982), thereby spinning-off. However, a different perspective on spin-offs has emerged, one in which the central motive for spin-off is not to realign assets due to asymmetries but to create asset complementarities (Sapienza, Parhankangas and Autio, 2004; Parhankangas and Arenius, 2003; Ito, 1995). These are outbound strategies to exploit accumulated knowledge and ideas within the firm’s network through the rapid implementation of innovations. It is about “bridging creativity and innovation by bringing new ideas into the market” (Itturiaga and Cruz, 2008: 1055).

Be that as it may, there are still problems with the formulation of adequate policies to promote and manage such processes (Itturiaga and Cruz, 2008). In particular, spin-offs can be very risky when unsuccessful ventures result in the loss of specific key assets and skills. Despite relevant contributions to the debate, proponents of the developmental view on spin-offs (Sapienza, Parhankangas and Autio, 2004; Parhankangas and Arenius,

2003; Ito, 1995) do not demonstrate how spin-offs contribute to the development of complementary assets and competencies. The problem lies in the static view of the RBV approach, which has a one-sided view on the development of spin-offs. It is either considered from the spin-off’s perspective (child organization) with the parent company acting as an incubator or it is considered from the parent’s perspective with the child enabling asset complementarities. To have a fuller view of such processes, we argue that attention should shift to the resource complementarities of both entities (Soda and Furlotti, 2017; Christensen, 1996; Dierickx and Cool, 1989; Teece, 1986). Despite the relevance of such inter-asset specificity to the strategic direction taken by a firm’s top management (Stieglitz and Heine, 2007), the subject has been little discussed in the RBV literature.

Another problem posed by the RBV framework is its tenet that key assets, whether central or complementary, should be controlled by the firm. This makes loosening the control of key complementary assets via a spin-off appear paradoxical. Yet spinning-off may help overcome a lack of specific technological knowledge (Hagerdoorn and Schakenraad, 1994). It may also further develop existing assets by giving access to a more nurturing environment outside the firm’s boundaries. In this paper we therefore accept the idea that key assets and competences may not lie just under the direct control of the organization, but also in its vicinity. In contrast to the RBV, the micro foundations stream (Felin *et al.*, 2012; Teece, 2007; Felin and Foss, 2005; Helfat and Peteraf, 2003) offers a more stimulating view on spin-offs and dynamic capabilities. Its aim is to probe the lower levels of strategy’s foundations, studying its actual emergence rather than analyzing it in an abstract fashion, which often results in tautologies. In particular, it aims at unveiling the role of managers and entrepreneurs in strategy formation (Felin *et al.*, 2012; Augier and Teece, 2009).

A MICRO FOUNDATION VIEW TO ANALYZE SPIN-OFFS WITH TWO LEVELS

Our research question is how do spin-offs contribute to the foundation of dynamic capabilities in a rapidly growing SME? These processes can be analyzed both at an organizational and individual level. Taking an MFV, we want to show that these levels can be reconciled. Starting with Teece’s (2007) model on the “microfoundations” of dynamic capabilities, we complete it with Adner and Helfat’s (2003) Model on Dynamic Managerial Capabilities, as well as other authors contributing to this work on the lower level order of dynamic capabilities (Helfat and Peteraf, 2015; Hodgkinson and Healey, 2011).

We use the Teece Model as “an umbrella framework that highlights the most critical capabilities management need to sustain the evolutionary and entrepreneurial fitness of the business enterprise” (Teece, 2007: 1322). We do so because it sheds light on the different elements that may support the three meta dynamic capabilities that are namely: (1) Sensing; (2) Seizing; (3) Reconfiguring. Sensing is an opportunity exploration process that involves technological and market trend scanning (Teece, 2007). It requires the extension of the organization’s boundaries to tap into the external environment. Such boundary spanning functions can be collective (Zhao and Anand, 2013), with spin-offs acting as a bridge where previous organizational members

interact with other stakeholders outside the usual networks of the parent company. Seizing is an opportunity exploitation process involving decision making in terms of investments, product architecture and business models (Teece, 2007). It requires a flexible organization that can achieve decentralization without compromising integration. Such a nearly decomposable structure (Simon, 2002) can be created with a spin-off that offers such flexibility, as the company explores its own new business model and its implementation in the vicinity of the parent organization. Reconfiguring is a continuous process of asset orchestration in line with environmental evolution (Teece, 2007). It requires ambidextrous properties (Tushman and O'Reilly, 2008: 191) where the essential task is not simply dedicating exploitation and exploration to separate sub-units but the processes of integrating them in a value-enhancing way. Spin-offs may also contribute to such ambidexterity as they often serve either to exploit or explore complementary assets.

The Teece model is, to date, one of the most comprehensive, widely cited and used to analyze the foundations of capabilities (Helfat and Peteraf, 2015; Hodgkinson and Healey, 2011). However, it has been criticized on two levels. Firstly, it tends to reproduce an outmoded concept of the rational (though boundedly so) strategist where the effortful and controlled mode of problem solving and reasoning is privileged and affective-based judgments considered as biases (Hodgkinson and Healey, 2011). This is in contradiction with a growing body of social cognitive neuroscience (Lowenstein *et al.*, 2008) where feelings, for instance, overcome deliberative thinking in judgment and decision-making. Hodgkinson and Healey (2011) introduce three propositions to counter-balance this excessively cold and deliberative orientation.

During sensing, the development of a psychologically secure learning climate may be central in taking into account both affective signals and intuitive cognitions, while also enabling both deliberative and effortful processing. Furthermore, intuition as affectively charged judgments (Dane and Pratt, 2007) could be more easily included into the repertoire if a mix of individuals with different cognitive styles are recruited (Hodgkinson and Clarke, 2007). During seizing, emotional commitment to new opportunities can increase the likelihood that they are effectively seized. Emotional commitment means that managers can engage other members by stimulating strong, clear and positive images related to new opportunities through scenario-building, for instance, to engage people (Healey and Hodgkinson, 2008). Finally, reconfiguration involves major changes that threaten the identities and self-concepts of managers and employees (Gioia, Shultz & Corley, 2000). This can breed much resistance constraining the adaptive capacity of the organization (Bouchiki and Kimberly, 2008). Thus, the regulation of identity-based affective responses may be crucial for effective strategic transformation.

What is more, as Helfat & Peteraf (2015) noted, the Teece model is mainly anchored at the enterprise level despite some references to the action of entrepreneurs and managers. To dig further into micro levels, we need to look at the decision level of actors, how and what they contribute to the constitution of dynamic capabilities. Along these lines Adner and Helfat (2003: 1020) have analyzed the concept of dynamic managerial capabilities defined as "capabilities with which managers build, integrate and reconfigure organizational resources and competences". They introduce

three central underlying factors: managerial cognition, human capital and social capital. Managerial Cognition (MC) refers to the beliefs and mental models of managers for decision-making (Walsh, 1995) that shapes strategic decision and outcomes (Kaplan, Murray and Henderson, 2003; Tripsas and Gavetti, 2000). There are different cognitive abilities for sensing, seizing and reconfiguring (Helfat and Peteraf, 2015). Sensing relies on the perception and attention of managers that facilitates environmental scanning through quick short cuts to enact opportunities (Baron, 2006). Seizing requires problem solving and reasoning managerial cognitive capabilities (Helfat and Peteraf, 2015). They involve controlled mental processing with formal rules of logic for well-defined problems or more automated heuristic processing for ill-defined ones. Reconfiguring refers to the selection, configuration, alignment and modification of tangible and intangible assets (Helfat *et al.*, 2007). Such asset orchestration will thus depend on the language and communication styles of managers and entrepreneurs, which may inspire and mobilize workers and also persuade others to engage in new projects.

Human Capital (HC) consists of learned skills resulting from an investment in education, training or learning (Becker, 1964). Castanias and Helfat (1991; 2001) distinguish between industry specific and firm specific skills that managers may possess and master differently according to their job positions and career paths. Some skills may be transferable or not from one organization to another. This induces heterogeneous expertise among managers and it may lead to different decisions and firm performances (Bailey and Helfat, 2003). Human Capital is also interrelated to managerial cognition. Previous work experience shapes cognition and conversely the mental models held by managers may also orient cognition and information search processes.

Social capital (SC) consists of the influence, control and power that individuals can derive from their social relationships (Adler & Kwon, 2002), from outside ties or from within organizations. External ties can improve the firm's performance with better access to external resources such as financing, but it is also useful to get information on practices in different firms (Getlatkanycz and Hambrick, 1997). Internal social capital results from formal and informal work relations within the organization (Burt, 1992). Depending on their position, career path and seniority in the organization, managers will have different networks and different access to information and other resources. Both internal and external social ties increase the managerial cognition base for decision making. It also affects their human capital by raising their knowledge base (Burt, 1997). Conversely, the human capital of a manager also influences social capital as their expertise makes them more sought after (Castanias and Helfat, 2001).

CONCLUSION OF THE THEORETICAL SECTION

Spin-offs are useful as phenomena to analyze the micro-foundations of dynamic capabilities at both the organizational and individual levels. At an organizational level, spin-offs go from incubation of the spin-off within the parent company to its foundation as a distinct organization leading to sustained cooperation. Our view here is to analyze this "supra" or higher-order level with the Teece (2007) influential model that fits well with his evolutionary and entrepreneurial perspective of capabilities development.

At an individual level, the focus is on the actions and collaboration of managers and entrepreneurs at different stages in the process of spinning off. Our perspective is to dig in this “infra” or lower-order level by embracing the perspective of dynamic managerial capabilities (Helfat & Peteraf, 2015; Hodginkson and Healey, 2011; Adner & Helfat, 2003).

By combining both levels in our analysis of spin-offs, we intend to reconcile them and show their complementarity, in particular by shedding light on the infra or lower-order level, for a more profound view on who, what and how spin-offs contribute to the micro foundations of dynamic capabilities in the context of rapidly growing SME.

Methods

Our research strategy is theory elaboration (Gilbert, 2005; Lee, Michell and Sablynski, 1999) that is both phenomenon-driven and theory-driven (Eisenhardt, 1989). Firstly, there is a lack of plausible theories on the role of spin-offs to the development of asset complementarities. Secondly, the MFV on dynamic capabilities seems to show promise in analyzing spin-offs but the alternative frameworks appear redundant or conflicting. Thus, we attempt to “simplify, reconnect and redirect theory” (Lee *et al.*, 1999: 166) on the role of spin-offs as dynamic capabilities in rapidly growing SME.

MULTIPLE CASES SELECTION

Our multiple cases were chosen for theoretical reasons such as replication, contrary replication, theory extension and elimination of alternative explanations (Yin, 1994; Eisenhardt and Graebner, 2007).

Firstly, we have selected SME with less than 500 persons that were undergoing rapid growth because spin-off processes are more frequent (Bruno and Tyebjee, 1984) and yet poorly studied in such organizational context (Feldman and Klofsten, 2000). So, multiple cases of spin-offs in rapidly growing SME

are more likely to enable better replication and extension of theory on spin-offs.

Secondly, we have chosen voluntary and sponsored spin-offs when there was a strategic intent to support such initiatives and where there were established relationships between the entities following their creation (Wallin and Dahlstrand, 2006; Bruneel *et al.*, 2013). There were other spin-offs identified, but we focused on the more recent ones to limit retrospective bias. Such purposeful sampling is intended to facilitate the extension of theory to constructs that relate both to spin-offs and dynamic capabilities.

Thirdly, all three parent companies have exhibited an average annual growth in turnover rate of 15% during a 5-year period (1997-2002). This rate was at least twice as great when compared to the industry average for the same period (See Table 1 for details). Such differential growth performance also offers potential for replication and extension of theory on dynamic capabilities, as high growth companies are more likely to exhibit dynamic capabilities (Eisenhardt & Martin, 2000).

Finally, for each parent organization, we chose two spin-offs: a rapidly growing one and a slower growing one (See Table 1 for details). Such variance in performance rather than average performance has been chosen to discuss eventual successes and failures, with the aim of building a rich and reliable model (Yin, 1994). It also enables contrary replication for contrasts when comparing the different spin-offs processes and their outcomes.

All the cases belong to three different service industries with different life cycles and growth rates. However, our research is not focused on the industry level factors as a potential explanation of the variance in dynamic capabilities. It is not “a theory of variance” but rather “a theory of processes” (Mohr, 1982; Langley, 1999), one that intends to analyze the evolution of a spin-off and how it contributes to dynamic capabilities. This process approach is in line with the MFV but it is also a limitation that we will discuss in our conclusion.



FIGURE 1			
Supra and Infra levels of MFV on Dynamic Capabilities			
Micro Foundation views (MFV)	Sensing	Seizing	Reconfiguring
<p style="text-align: center;">  Supra Level Organizational Process oriented </p>	Environmental scanning	Flexible organizing	Assets orchestration
	Spin-off Development View		
	Incubation	Foundation	Cooperation
<p style="text-align: center;"> Infra Level Individual People oriented  </p>	Emotion		
	Secure learning environment	Emotional commitment	Identity-based affective responses
	Managerial Cognition		
	Perception/Attention	Problem Solving/Reasoning	Communication styles
	Human capital		
	Industry/firm related skills		
	Social capital		
Internal/External ties			

TABLE 1
Data collection

Status	Name	Av. size	Firm growth*	Main activities	Industry growth*	1 st round	2 nd round	3 rd round	Secondary data
Parent A	Mecanix	300	14%	Pump manufacturing and distribution	4%	1 interview with J.D	1 interview with J.D	1 interview with J.D	Annual reports Sector reports Press articles
→ Child 1	Hermetic	10	12%	Pump engineering	4%	2 interviews with C.D & M.D	1 interview with M.D	1 interview with C.D + 1 field observation	
→ Child 2	Balneo	8	5%	Pump components	4%	1 interview with C.V	1 interview with C.V	1 interview with C.V	
Parent B	Gama	490	18%	Game editing, development and distribution	9%	1 interview with C.B	1 interview with C.B	1 interview with C.B	Annual reports Sector analysis Website
→ Child 1	Rally	25	24%	Game development	9%	1 interview with S.B	1 interview with S.B	1 interview with S.B + 1 Meeting	
→ Child 2	Action	5	7%	Game development	9%	2 Interviews E.A & F.D	1 interview with F.D	1 interview with E.A	
Parent C	Buidly	80	13%	Construction & Maintenance	4%	1 interview with P.V	1 interview with P.V	1 interview with P.V	Annual reports Sector analysis Press articles Website
→ Child 1	Ecolo	10	11%	Green engineering	4%	2 Interviews F.P & A.M	1 interview with F.P	1 interview with A.M + 1 meeting	
→ Child 2	Login	15	4%	Software development	4%	1 interview with L.T	1 interview with L.T	1 interview with L.T	

Acronyms: C.B: Gama Founder and CEO; S.B: Rally Founder; E.A: Action Co-Founder; F.D: Action Co-Founder; P.V: Buidly CEO; F.P: Ecolo Co-Founder; A.M: Ecolo Co-founder; L.T: Login Founder; J.D: Mecanix CEO; C.D: Hermetic Co-founder; M.D: Hermetic Co-founder; C.V: Balneo Founder

* Calculations are based on two sets of data: 1) Income statements of companies cited for the period of 1997-2002. 2) Industry sector growth rate for the same period. This public data is provided by French National Statistics (INSEE: www.insee.fr): Video Game: 58.21Z; Pumps: 28.13Z; Construction: 41.20 B.

DATA COLLECTION

As shown in Table 1 above, we have collected multiple sources of data: 30 interviews (12 owner managers in the growing firms and 18 spin-offs founders) at different phases during an 18-month period with a set of observations and secondary data. Such methodological design was adopted to follow more closely the spin-off process at different stages and to limit bias.

For each case, three rounds of semi-directed interviews (90 minutes on average) were organized in three phases (6 monthly intervals) with both the owner-managers of the medium sized firms and the spin-off founders. Study participants were contacted via our personal networks. We have used a snowball process to gather information. Over the 18 months, the data collection was facilitated by the establishment of a good level of trust between the researcher and the interviewees. A sole investigator conducted all interviews and played the role of the passive observer at the different sites.

Three important observations were made at different sites. The investigator attended a report meeting between the owner-managers of Gama with Rally spin-off founders where notes were taken. The preparation of an important customer order at Hermetic was observed. At Buidly, the investigator participated in a strategic sales meeting between the owner and the two co-founders of Ecolo.

To achieve triangulation, we had several interviews with the different founders and owner managers to get confirmation of what they said at different points in time. We also had an account of the same process by at least two or more people to check if their stories were similar. We also triangulated with other secondary sources of data (press release, websites, annual reports and sector reports, etc.) mainly for background information to see if there was congruency (Beverland and Lindgreen, 2010; Jick, 1979).

DATA ANALYSIS

Both inductive and deductive logics are combined in our data analysis, which can be described in three steps: inductive, deductive and iterative.

In the inductive phase, the spin-offs were narrated by integrating the accounts of the different protagonists into a single time line with all critical events. This time bracketing (Langley, 1999) enabled us to have a plausible overview of the story of a spin-off with all critical events during the spin-offs (See Table 2 below).

In the deductive phase, we used Teece's framework (2007) as well as Adner and Helfat's model (2003) as sensitizing concepts (Glaser, 1978, Patton, 2002; Blumer, 1954). We set up a list of codes based on these two models. We then further broke them down into sub-components according to the model, and numbered them. Finally, we engaged in a within-case analysis as shown in Table 3 below.

FIGURE 2
Data analysis processes

Data analysis	Step 1	Step 2	Step 3
Cycles	<i>Inductive</i>	<i>Deductive</i>	<i>Iterative</i>
Processes	<ul style="list-style-type: none"> - Within-case description - Bracketing time - Spotting critical events - Integrating multiple voices to craft a story 	<ul style="list-style-type: none"> - Within-case analysis - Listing & selection codes - Refining and relating quotes and codes 	<ul style="list-style-type: none"> - Cross-case comparisons - Grouping similar patterns - Constrasting different patterns - Underline emerging patterns
Outcomes	- Congruent story of each spin-offs	- A repertoire of codes and quotes as a system	- Set of theoretical propositions informed with data

TABLE 2
Case presentation and time-line

Parent A (Mecanix)	
<p>Mecanix is medium-sized family firm specialized in pump manufacturing mainly for industrial use. In 1990, J.D took over the company with a strategic intent to innovate and diversify its range of products. We have selected two spin-offs: Hermetic and Balneo. The first one was meant to outsource and better exploit existing assets that were underdeveloped and somehow less central for the company. The second one was meant to innovate and explore new key assets where the company lacked know-how.</p>	
Parent A – Child 1 (Hermetic)	Parent A – Child 2 (Balneo)
<p>In 1993, J.D decides to explore new pump technologies with a greater degree of tightness, as industry norms become more demanding. In 1994, C.D, an experienced engineer is recruited to explore these new technologies. In 1996, along with a supplier, C.D starts developing a prototype with high-level of tightness backed with R&D and the sales department. In 2001, a first line of pumps is released and ready for commercialization but conflicts arise with the sales department. Decision is made to spin-off this technology for a better control of its technological and market development.</p>	<p>In 1996, J.D decides to outsource the manufacturing of a specific line of pumps for household. However, the purchasing manager convinced him to exploit such assets rather than selling it to industry. In 1998, C.D, the workshop manager proposes to buy out this activity with another owner-manager from a related-industry. In 1999, J.D agrees to support them with an outsourcing contract. In 2000, the company is founded as Balneo with Mecanix as its main customer (distributor) during the first three years. After three years, it has diversified its customer base shifting its dependency to Mecanix from 70% to 40%.</p>
Parent B (Gama)	
<p>Gama is a medium-sized video game editor and developer founded by C.B. The company has always relied on two main approaches to game development: internal development via project teams and external development with selected independent game developers. Spin-offs such as Rally and Action appear as a third alternative process to explore game development projects that creative teams wish to pursue on their own and/or that the company can't fully support financially.</p>	
Parent B – Child 1 (Rally)	Parent B – Child 2 (Action)
<p>In 1998, S.B, an influential project manager for simulation games, leaves Gama to create his own company with his creative team. C.B agrees to support him as their main customer for their first video game order. In 2000, this game being successful, the team starts expanding and gets another order from C.B for another exclusive sequel. In 2002, the second sequel being equally a success, Rally becomes a renowned game developer and they start to work with Pixel for another game in a different universe. In 2004, Rally has nearly doubled in sized with a productive capability for two-three games in parallel. In 2005, Gama acquires Rally.</p>	<p>In 1999, E.A, a well-known game developer leaves Gama to create his own creative studio to develop a specific genre of action-adventure game. Despite some skepticism, C.B accepts to support him with an order for his first sequel. In 2001, they succeeded in delivering their first game without respecting the deadlines and with a substantial rise in development cost. The first sequel for this action-adventure game is not a huge success but it has some recognition as a novel genre. In 2002, the team wins a second order for a second sequel by Gama. In 2003, the team delivers a new sequel but sales are still low. Gama announces that they will not order another game.</p>
Parent C (Buildy)	
<p>Buildy is an engineering and construction company mainly in industrial buildings. In 1999, P.V. took over Buildy with the intention of transforming the family business from generic engineering and construction activities into more specialized fields [such as more complex industrial sites]. For such renewal, P.V needs to recruit, but such a process is not easy for SMEs. He thinks about another astute way of encouraging talented people to come and develop their projects as entrepreneurs by collaborating with other selected employees within the SME. Two projects were launched (Ecolo and Login).</p>	
Parent C – Child 1 (Ecolo)	Parent C – Child 2 (Login)
<p>In 2000, P.V intend to acquire an activity in green engineering. He identifies an interesting company but fails to acquire it. During this process, he meets F.P, an experienced engineer in this area, who wants to leave his company for another professional venture. In 2002, he convinces him to join Buildy as an employee but with the intention of creating a new company where he will be co-owner. Along with A.M, F.P is recruited as intrapreneurs to develop green engineering within Buildy. In 2003, both will work autonomously within Buildy to develop a new market for Ecolo in green engineering by leveraging the existing customer base, but also bringing new customers from their previous social networks. In 2004, Ecolo is created on the market segment of green engineering of Buildy.</p>	<p>In 1999, P.V decides to upgrade the engineering activity with tailor-made 3D software for the design of construction. In 2000, he meets L.T, a PhD student, who is working on a related application to develop such a prototype during this thesis. The student is recruited to test and develop this application with Buildy's engineers. The project turns out to be successful and both L.T and P.V think that there is market potential beyond Buildy. In 2001, L.T is recruited as an employee to further develop the software within Buildy before spinning-off as an independent company where L.T and P.V will be co-investors. In 2003, Login is created as a separate company with both L.T and P.V as co-founders and it becomes a special supplier of 3D software for different engineering markets.</p>

TABLE 3
Extracts of within-in case analysis (Case A)

Sensing (S)		Analytical systems (& individual capacities) to Sense, Filter, Shape, and Calibrate Opportunities (Teece, 2007)		Mecanix (Parent A)	
				Hermetic (Child 1)	Balneo (Child 2)
				PA-C1	PA-C2
Sub-components (Teece, 2007)	Direct Internal R&D & Select New Technologies	S1	"Part of it was developed in house... but to flourish, they needed to go outside" (J.D)	"There is a specific know-how for mastering small engines in aluminium" (J.D)	
	Tap Supplier & Complementor Innovation	S2	"He was running a pump repair workshop in Lyon...I've known him for years. He was a fantastic "bricoleur" ...a technical genius" (C.D)	"F.P is the right man...he has very good connection with all the relevant suppliers of green building" (P.V)	
	Tap Developments in Exogenous Science & Technology	S3	"Lyon region is a great place for research in chemistry, it's good to be located there" (C.D)	"We need other connections outside Mecanix...they are moving out this market and technologies." (C.V)	
	Identify Target Market Segments, Changing Customer needs & Customer Innovation	S4	"This order from GP was great because we had to upgrade our ability to produce a whole system with larger pumps... we are also developing maintenance services" (M.D)	"It's a growing market for household balneotherapy. Our market study showed that there are opportunities" (C.V)	
Managerial cognition (Mc)		Managerial beliefs and mental models that that shapes strategic decision making and outcomes (Walsh, 1995; Kaplan <i>et.al.</i> , 2003; Tripsas & Gavetti; Adner & Helfat, 2003)		Mecanix (Parent A)	
				Hermetic (Child 1)	Balneo (Child 2)
				PA-C1	PA-C2
Sub-components (Helfat & Peteraf, 2015)	Perception	MC1	"We knew that we had to shift to more complex liquids in terms of toxicity and viscosity. The norms are heavier and we need specific adaptations in terms of power and also tightness" (J.D)	"We had a good feeling for each other. It's hard to explain but it's a guy I've always appreciated. He has an entrepreneurial temperament" (J.D)	
	Attention	MC2	"[...] This requires to conform our pumps with different ratios in the chemical industry but also be introduced on new markets that are very selective" (C.D)	However, he was only 30 and we also thought he might lack experience to take over this activity. We wanted some guarantee" (J.D)	

The third step was iterative. Here pairs of cases were juxtaposed in order to identify patterns of similarity and difference. These similarities and differences were listed in Excel tables accordingly to the different codes of analysis. From these lists and comparisons, tentative propositions were induced as shown in Table 4 below.

Results

Our results are structured around both supra level and infra level processes. The supra processes are higher order functions relating to Teece's (2007) concepts of Sensing, Seizing and Reconfiguring for capability development whereas the infra processes are lower order abilities relating to dynamic managerial capabilities (Adner and Helfat, 2003; Helfat and Peteraf, 2015). For each dynamic capability, we will underline a key example but we will also show the differences with other cases.

THE BOUNDARY SPANNING FUNCTION OF SPIN-OFFS FOR SENSING

Table 5a summarizes our evidence on the boundary spanning function of spin-offs to sense opportunities. Spin-offs increase the porosity of the parent organization boundaries through two main processes: outbound and inbound. The former consists of outflows of human and technological know-how that the organization externalizes. The latter consists of inflows of customers' and suppliers' know-how that the organization internalizes.

Overall, the spin-offs have this dual function of boundary spanning that stretches the boundaries of the parent-organization and establishes linkages with different external actors.

For example, within Mecanix, Hermetic and Balneo are two technological spin-offs meant to explore new pump applications. Previous knowledge had been developed on those specific assets but Mecanix lacked complementary know-how and assets for further development. In the case of Hermetic, the Mecanix owner-manager lacked know-how despite high potential (*Quote-A1a*). Originally composed of an engineer, recruited from a major chemical company, and a repair workshop manager, the project team was looking for further exposure to a more nurturing business ecosystem (*A1b*). The decision was thus made to develop this prototype outside the R&D department within a maintenance workshop based in Lyon where there are also many potential stakeholders in the chemical industry.

The search movement leaves scope for seeking complementarities within the parent firm to tap into other potential collaborators such as customers and suppliers. In other words, it is an inbound process. The two founders of Hermetic will go on to win a contract with a large chemical company to develop a specific pumping system, one that is larger and more complex in technical terms (*A1c*). Hermetic illustrates how a spin-off can serve to redirect specific R&D know-how outside the organizational boundaries.

In the case of Balneo, the Mecanix owner-manager emphasized a realignment strategy to free up resources despite a good level of profitability (A2a). However, C.V, the production manager; convinced J.D, the owner-manager that the know-how was quite specific and there might be a market to explore (A2b). However, J.D was not convinced about the strategic interest of this activity for Mecanix but he was open to accept a management buy-out proposal (MBO) if he could raise money to buy this activity. The original process was thus focused on externalizing these assets.

The production manager succeeded in presenting a solid MBO project. In particular, he obtained support from another owner-manager of a mechanical company interested in developing these small engines for pumps in the spa market (A2c). Finally, the Mecanix owner-manager kept a minor share within the new company, impressed by the enthusiasm of the founding team on the market perspectives (A2d). Finally, in the process of exploring opportunities and new connections outside, there are potential inflows of know-how and assets that Mecanix views positively. This favors internalization to some extent.

The two other cases complete these findings in a similar vein. Spin-off contributes to boundary spanning both through inbound and outbound processes. The only difference lies in the deliberate or emergent nature of these processes. In the cases of Mecanix and also Buildy, spin-offs appear as proactive strategies to recruit and engage employees in the exploration processes. In the case of Gama, the strategies are more reactive, against the decision of a key employee to depart from the firm.

THE DYNAMIC MANAGERIAL CAPABILITIES THAT SUPPORT BOUNDARY SPANNING

At the infra level, there are a set of dynamic capabilities that managers and entrepreneurs exhibit to support the boundary spanning function of spin-offs at the supra level. Table 5b summarizes our main findings on the three capabilities that both the owner managers (the parent firm) and entrepreneurs (the child firm) exhibit: perception and attention abilities, recruitment and social networking. We find that both managers and entrepreneurs have developed a higher level of perception and attention to external changes in their environment as Mecanix's

TABLE 4
Extracts of cross case analysis (Cases B-C)

Seizing	Opportunity exploitation process that requires decision making in terms of investments, product architecture and business model (Teece, 2007)		Gama - Rally (Parent B - Child 1)	Buildy - Ecolo (Parent C - Child 1)
			PB-C1	PC-C1
Flexible organizing function	Autonomy Defining its own business model and its assets portfolio	A1	"We wanted both to extend our portfolio of games into action-adventure and also be able to produce two games within the same time period" (S.B).	"We value his views and encouragement to push us further in extending the business, we have never thought about going on larger HQE projects, he pushed us on that" (A.M).
		A2	"Working with PIXEL has enabled us to improve considerably our management processes" (S.B)	"We are now recognized as a specialist in green engineering. It goes from industrial sites for recycling to green homes" (F.P)
	Interdependence Formal control & Informal commitment	I1	"Rally is one of our star developer. V-Rally was a hit. We have always been very supportive to push them further in creativity. They are distinctive but also part of us..." (C.B)	"Even if we are extending the customer base, it's easier to build on an existing one...Mr. has also a very good personal network that we use" (A.M)
		I2	"We have regular hook-ups; we meet informally but also in formal gatherings. Our teams work hand and in hand. We respect their talents and we will back them (C.B)	"P.V accepted to manage the company at the beginning. It's not about control but to protect us. We are still employees that have share in the company" (F.P)
Human capital	Learned skills resulting from investment in education, training or learning (Becker, 1964; Castanias & Helfat, 1991; 2001)		Gama - Rally (Parent B - Child 1)	Buildy - Ecolo (Parent C - Child 1)
			PB-C1	PB-C2
Skills development	Industry specific skills	HC1	"Working with an American company was tedious but we've learnt a lot on how to respect strict deadlines, we had to go through all this process of reporting but it really helped at the end to improve our productive capacity" (S.B)	"In two years', time, he has developed a technical ability to develop tailor made applications for engineering. I see most potential for commercialization of those applications into the green engineering market" (P.V)
	Firm specific skills	HC2	"S.B and his creative team have developed a distinctive know-how in simulation games. They have also a higher productive capability than other teams within our company" (C.B)	"We know now how to collaborate efficiently with the R&D department of BUILDY. They trust us and are very supportive" (F.P)

owner manager explains (A1a). Similarly, Hermetic's co-founder was also aware of the company's lack of technical and market know-how to develop such specific assets (A1b). However, Hermetic's co-founder has more time to devote attention to develop solutions to resolve problems they perceived. Having different organizational positions (the owner manager at a corporate strategic-level and the entrepreneur at a business functional-level), they complement each other's views. They have also complementary background experiences (the former is more company oriented and the latter is more industry-related).

We also found that the owner managers have the power to recruit enterprising individuals who introduce skills variety in the organization (A1c). Having an overview of their company needs, they can make novel combinations of human capital. Such a process for recruiting the right human capital is not solely rational, but also based on emotional grounds as the manager explains: (A2a). On the entrepreneur side, there was also a perception that there is good collaborative between the two persons in question despite different mindsets (A2b). Lastly, the entrepreneur's external social networks were highly valued as mechanisms for boundary spanning as Mecanix's manager explains: (A1d). The entrepreneur confirms as well that he had developed an alertness to specific weak signals on markets and technologies. The external social networks of entrepreneurs tap into other knowledge bases beyond the vicinity of the organization (A2d). On the owner manager side, he has developed

internal and external social networks to give the entrepreneurs access to financial resources. In terms of network structure, they complement each other as well.

As expressed in our Table 5a, the two other cases provide evidence to support these three main dynamic managerial competencies of both managers and entrepreneurs. Differences appear in the case of Gama. Perception and attention abilities are also high but they are more focused on the internal organizational issues, which are perceived negatively, and that encourage employees to leave the company. Furthermore, instead of recruitment abilities, it is more the ability of management to retain employees and their teams through sub-contracting that is central.

THE FLEXIBLE ORGANIZING FUNCTION TO SEIZE OPPORTUNITIES

Table 6a summarizes our evidence on the flexible organizing function of spin-offs to seize opportunities. On one side, spin-offs are autonomous processes that achieve adaptation and differentiation in relation to environmental specificities. On the other side, they are interdependent processes as long as both parent and spin-offs organizations sustain their mutual commitment. Overall, the three cases demonstrate that such a balance between autonomy and interdependency is achieved sequentially, either to tap further into the external environment or to get access to specific know-how and assets.

TABLE 5a
The boundary spanning function to sense opportunities

Sensing Supra	Mecanix (Parent A)		Gama (Parent B)		Buildy (Parent C)	
	Hermetic (Child 1)	Balneo (Child 2)	Rally (Child 1)	Action (Child 2)	Ecolo (Child 1)	Login (Child 2)
Outbound Outflows of employees and technological know-how	<p>A1a "This technology had high potential but it was minor within the R&D department and quite risky, we also lacked know-how inside the company to fully develop it..." (J.D)</p> <p>A1b "They [R&D] don't have a clue of the importance of this technology, it was time to be on our own ..." (C.D)</p>	<p>A2a "The line was a profitable one but we needed to refocus on our main activities and also the money to expand in other areas..." (J.D)</p> <p>A2b "There is a specific know-how for mastering small engines in aluminum. I was convinced of its market potential outside" (J.D).</p>	<p>B1a "At some point, they got a little bored. They needed a new challenge and autonomy and we didn't want to lose them..." (C.B)</p> <p>B1b "We are passionate about new genres. Our creatives have different prototypes of game s that we can explore further in line with new trends" (S.B)</p>	<p>B2a "Our creatives need to refuel themselves outside...things are moving fast, new gamers, new game, new design and technologies" (C.B)</p> <p>B2b "Action game is a special world; we are looking forward to collaborate with other studios like Gama" (E.A)</p>	<p>C1a "Part of it was developed in house...but to flourish, they needed to go outside. We encouraged them to connect to customers and users that are really involved in ecological buildings and environmental issues" (P.V)</p>	<p>C2a "Buildy offers good connections to other construction companies in larger projects...it a good place to test the software" (P.V)</p>
Inbound Inflows of suppliers and customers know-how	<p>A1c "This order from GP was great because we had to upgrade our ability to produce a whole system with larger pumps... we are also developing maintenance services" (C.D)</p> <p>A1d "He was running a pump repair workshop in Lyon...I've known him for years. He was a fantastic "bricoleur" ...a technical genius" (C.D)</p>	<p>A2c "He came with a solid partner to develop this line. I was finally convinced that he was the right option..." (J.D).</p> <p>A2d "It's a growing market for household SPA. They brought market information from users that showed that there are opportunities" (C.V)</p>	<p>B1c "Working with PIXEL has enabled us to improve considerably our management processes" (S.B)</p> <p>B1d "We are developing new connections with animated comics studios" (S.B)</p>	<p>B2c A small team attracts more easily the young creative...Our work environment is cool and funky." (E.A)</p> <p>B2d "We work more closely with the new generation of gamers...we have invited them here and we are testing">(E.A)</p>	<p>C1b "F.P is the right man...he has very good connection with all the relevant suppliers of green building" (P.V)</p> <p>C1c "It's growing quickly with new norms and regulations, fortunately, we are getting rapidly orders, this will enable us to test our new services..." (F.P)</p>	<p>C2b "We lack connections in software development, ...I have started to be involved in various professional conferences and events..." (P.V)</p> <p>C2c "I have recruited a doctoral student in software development applied to civil engineering." (L.T)</p>

For example, after developing a successful first game for Gama, Rally has strengthened its reputation in the business ecosystem as a key developer for iconoclast driving games. Gama engaged Rally for a second version, which they accepted. However, in their willingness to develop other games, they also started to work for another direct competitor to develop a different game (B1a). Working with two competitive projects has been recognized as an effective lever for raising the productive capability of the company within tight deadlines (B1b). Various complementary assets and skills-sharing appear on the grounds of distribution/marketing, and on technological or infrastructural sharing as well. By selecting and redefining its boundaries, Rally has not only leveraged and extended its technological resource base beyond the scope of the parent company. What is more, it has developed unique creative and productive platform capabilities that are physically outside the parent company, but which still have strong linkages, as Gama's owner-manager argues (B1c)

At this stage, Gama was very attentive to the development of Rally outside its scope, fearing that competitors might acquire them. They dedicated special attention to nurturing relationships through regular contacts and offers for developing new games (B1d) to sustain commitment and interdependence, while encouraging them to explore new technological and market opportunities outside the usual scope of Gama. In the case of Action, such careful arbitrage between autonomy and interdependence is also apparent despite the difficulties of the company in managing the cost of new product development. After six months of operation, the leaders had to negotiate a 20 percent extension in their resource allocation (B2a). On the Gama's side, they made it clear that this was the only extension that would be granted (B2c). Six months later, Action was still facing severe problems with another budget shortage. To finish the game, the company had to renegotiate an extension with Gama (B2d). Finally, Action got Gama's financial support. In the end, they succeeded in delivering the new game but the sales

TABLE 5b
The dynamic managerial capabilities for sensing

Sensing Infra	Mecanix (Parent A)		Gama (Parent B)		Buildy (Parent C)	
	Hermetic (Child 1)	Balneo (Child 2)	Rally (Child 1)	Action (Child 2)	Ecolo (Child 1)	Login (Child 2)
Perception & attention Alertness to both rational and affective signals from the organization and environment	A1a "We knew that we had to shift to more complex liquids in terms of toxicity and viscosity. The norms are heavier and we need specific adaptations in terms of power and also tightness" (J.D) A1b "[...] This requires to conform our pumps with different ratios in the chemical industry but also be introduced on new markets that are very selective" (C.D)	A2a "We had a good feeling for each other. It's hard to explain. I've always appreciated him. He has an entrepreneurial temperament. Still, he was only 30. So, he might lack experience to take over this activity. We wanted some guarantee" (J.D) A2b "We do not think the same way. I'm more open to novel techs and markets...He is way more focused but we fit quite well" (C.D)	B1a "There was higher pressure to deliver original games with short deadlines and lower budgets. We were losing the pleasure of making games. I was convinced that being within Gama was not much helping. That's why I moved out and I think that they understood that" (S.B)	B2a "I was fed up with hierarchy and all the political issues related with management. I was very open to that with C.B." (E.A) B2b "E.A wanted to come back to gaming. I think that he is in essence the game designer. I really value that he was frank to me" (C.B)	C1a "I couldn't explain it when I first met him, I was confident that he was the right person to develop this activity... It was not just a matter of resume; We had a good connection" (P.V).	C2a "I met him when I was teaching in an engineering school. He was one of my students and I really appreciated his intelligence. Well, it was quite easy to recruit him for this job" (P.V)
Recruitment Engaging people as employees or as subcontractors	A1c "We were happy to recruit C.D who left his company after a restructuration, he had the right competencies, both technical and market know-how [...] we often operate like this, opportunism no specific planning, just listening to our markets" (J.D)	A2c "I knew he had an entrepreneurial potential. He is a jack of all trade. He is recognized and appreciated by his team. Furthermore, he knows quite well how to run the workshop" (J.D)	B1b "S.B was one of our famous game project managers. He has been involved with us for the past ten years as a game designer but also a production manager for several games. I guess at some point he wanted to come back to game creation" (C.B)	B2c "E.A is well known for his touch for game design in action-adventure. He is very creative person but he has also developed some managerial skills in conducting several game projects" (C.B)	C1b "I recruited him because he was excellent in his job and he wanted to create his company. However, he was not confident in his sole ability to create one from scratch. I offered to help him on that basis. We were complementary" (P.V)	C2b "He was already working on a related application to engineering. This was part of his doctoral thesis. He wanted to test the software and we wanted to develop one in-house. That was perfect timing for us" (P.V)
Social networking External and internal social ties creation, development and maintenance	A1d "We valued his past experience in a well-known company, he had the right connections as well to enable us to develop our pumps in this new segment" (J.D)	A2d "I was looking for a new location and I met this guy who was running a workshop. We had a good connection. He was interested in my project and offered support. We had serious talks before settling an agreement" (C.V)	B1c "We are now connected to different editors interested in our range of game. We have a strong recognition for simulation. In our teams, there are a lot of talented guys with various connections to different game communities" (S.B)	B2d "I have more time to connect to game communities, thanks to new members in the company, it's fun and we are learning a lot on upcoming trends for game play" (E.A)	C1c "Initially, I was supposed to start on my own. But after discussing with P.V, we thought it would be better if I had another colleague. A.M was the perfect partner. We knew each other for years and worked well together" (F.P)	C2c "I had strong connections with my laboratory in the engineering school. I was part time there for the thesis and also involved in the company to test and develop the software" (L.T)

were lower than expected, despite press recognition. This led to less support from Gama for a new game development despite several calls from the action team members (*B2b*).

This sequential balancing of autonomy and interdependence is also apparent for Mecanix with its two child organizations. However, for Buidly and its two spin-offs, this is less evident as the two organizations were located within the company itself with a prevalent managerial role of the parent organization, especially at the initial phases of the spin-off. Despite a strong dependency on the parent company, there was an imperative from the entrepreneurs to develop their autonomy (*C1b*).

THE DYNAMIC MANAGERIAL ABILITIES THAT SUPPORT SEIZING

At the infra, or individual level, there are a set of dynamic abilities that managers and entrepreneurs exhibit to support the flexible organizing function of spin-offs, such as seizing at the supra level. Table 6b summarizes our main findings on the three capabilities that both the owner managers (the parent firm) and

the entrepreneurs (the child firm) demonstrate: problem solving, skills development and emotional commitment. The three capabilities are not expressed by all: the entrepreneurs showed the first two, whereas the owner manager exhibited the last.

The data show, first, that the entrepreneurs have developed astute problem solving and reasoning abilities, which are not solely rational insofar as they are tainted with emotions. When this opportunity of working with Pixel came out, Gama's founder could have refused because it could have jeopardized the substantial contract, they had with the parent firm given that they had negotiated exclusivity. However, given their close ties and his bargaining power as a well-known developer, he was able to find an acceptable solution by working with both competitors as a means of extending its productive capabilities.

Second, it appears that being involved in different projects with different clients, the entrepreneurs as well as other employees, developed both firm- and industry-specific skills. In the case of Gama, they extended their operations management skills for game development (*B1b*). In the case of Action, they

TABLE 6a
The flexible organizing function to seize opportunities

Seizing Supra	Mecanix (Parent A)		Gama (Parent B)		Buidly (Parent C)	
	Hermetic (Child 1)	Balneo (Child 2)	Rally (Child 1)	Action (Child 2)	Ecolo (Child 1)	Login (Child 2)
Autonomy Defining its own business model and its assets portfolio	<p>A1a “[...] It seems that we are developing a new niche for taylor-made pumping system with maintenance services” (J.D)</p> <p>A1b “This was a big challenge for two reasons, we have never made a whole system that require larger pumps” (C.D)</p>	<p>A2a “We knew that for this activity to stand on its own, we needed to move downstream to further develop our own systems, that's where the profits were more interesting” (C.V).</p> <p>A2b “We agreed to support them but it will not be sufficient to make a substantial development [...] he need to raise funds outside [...]” (J.D)</p>	<p>B1a “We wanted both to extend our portfolio of games into action-adventure and also be able to produce two games within the same time period” (S.B).</p> <p>B1b “Working with PIXEL has enabled us to improve considerably our management processes” (S.B)</p>	<p>B2a “It was tough but we argued that the real costs have been underestimated in our business plan, it's our fault but it's the first time we are developing on our own...” (E.A)</p> <p>B2b “We are still in contact but they are very uneasy for another order. We told them that we've learned a lot after this first release. There are more to come and we are ready. So far, we have no clear response so far. We can't tie our survival to Gama. We are looking to competitors”. (E.A)</p>	<p>C1a We value his views and encouragement to push us further in extending the business, we have never thought about going on larger HQE projects, he pushed us on that” (A.M).</p> <p>C1b “We are now recognized as a specialist in green engineering. It goes from industrial sites for recycling to green homes [...] We have a distinctive activity from Buidly” (F.P)</p>	<p>C2a “We invented new functionalities and in less than one year, we released a beta version that was tested with Ecolo and also among a pool of customers.” (L.T)</p> <p>C2b “[...] we need stronger connections in software development, we are establishing a partnership with the local university”. (L.T)</p> <p>C2c “[...] If there is also a market for selling software's, we'll go for it but probably with other partners” (P.V)</p>
Interdependence Formal control & informal commitment	<p>A1c “We wanted to work with him not only to test new pumps but also develop a special service for pump maintenance” (C.D).</p> <p>A1d “This technology, we have contributed to its development. The products can't appear as a separate line. It's part of our offer.” (J.D).</p>	<p>A2c “We got a 3-year contract with special payment conditions for our cash flow. The material we took over was also sold at a very reasonable price. This was very helpful to start-up” (C.V)</p> <p>A2d “We consider them as being part of us. We really care for them. At some point, I even thought about having a share. It's better for him to have full ownership” (J.D)”</p>	<p>B1c “Rally is one of our star developer. V-Rally was a hit. We have always been very supportive to push them further in creativity. They are distinctive but also part of us...” (C.B)</p> <p>B1d “We have regular hook-ups; we meet informally but also in formal gatherings. Our teams work hand and in hand. We respect their talents and we will back them (C.B)</p>	<p>B2c “They have to put in place a better budget control, we can help them to fix that” (C.B)</p> <p>B2d “They had technical problems. One member left in the middle, etc. but the thing is that autonomy doesn't mean no rules, it's clear that they lack control” (C.B)</p>	<p>C1c “Even if we are extending the customer base, it's easier to build on an existing one... Mr. has also a very good personal network that we use” (A.M)</p> <p>C1d “P.V accepted to manage the company at the beginning. It's not about control but to protect us. We are still employees that have share in the company” (F.P)</p>	<p>C2d “My main interest is to develop this activity with them. But I don't want them to be dependent on Buidly. They must decide and act as entrepreneurs. It's also their business.” (P.V)</p> <p>C2e “When I trust, I reduce all psychological barriers to make them feel more comfortable with me. Then, they have to take shares and progressively, assume higher risks” (P.V).</p>

developed their HRM skills to better recruit and retain talented young creatives (B2b). Furthermore, they also expanded their knowledge base on new ways of gaming by circulating beyond the usual social circles of the parent organization (B2d).

Finally, the owner managers express strong emotional commitment. When Action had some difficulties in respecting the deadlines, the owner manager decided to grant an extension only after a serious talk with the founder (B2c). Here, emotions related to product prototypes and scenarios have superseded the rational argument of not respecting deadlines and rising cost of development.

As expressed in our Table 6b, the two other cases provide complementary evidence to support these three main dynamic managerial competencies of both owner managers and entrepreneurs. Flexibility to seize opportunities depends on both leaders' capabilities to build and sustain a common vision that

commits them emotionally while leveraging complementary resources in scope and depth that are related to their different sets of social capital or human capital.

THE AMBIDEXTROUS ORCHESTRATION FUNCTION TO RECONFIGURE ASSETS

Table 7a recapitulates the different evidence on the ambidextrous orchestration function of spin-offs to reconfigure assets. On one side, they explore complementary assets for both the parent and child organization in the vicinity of their borders. Such exploration includes new assets identification, investments and business model refinement. On the other side, they exploit complementary assets in common within their borders. Such exploitation includes the coordination of co-specialized assets, a common vision to exploit such resources and innovation incentives.

Seizing Infra	Mecanix (Parent A)		Buildy (Parent B)		Gama (Parent C)	
	Hermetic (Child 1)	Balneo (Child 2)	Rally (Child 1)	Action (Child 2)	Ecolo (Child 1)	Login (Child 2)
Problem solving Thinking towards solving specific problems (cold/hot)	A1a "It was not easy to develop the prototype. Each time, we find solutions. It was really on a fine line. When we had our first robust and stable prototype. We were really glad that we celebrated that together along with J.D." (C.D)	A2a "He had some issues to reorganize his workshop in a more efficient way. I knew he needed some help. We had this consultant who was working for us. I recommended him" (P.V)	B1a "Well, of course we would have preferred exclusivity but C.B and his team were real stars. We had to find a solution and we accepted for one game to give a try even if they were working for our competitor" (S.B)	B2a "When they had this budget crunch. We offered to back them but in exchange, they had to put in place a more rigorous reporting. Somehow, we helped them to improve their process along that line" (C.B)	C1a "It's up to them to take some decisions on serious issues like new contracts, customer dissatisfaction or strategic orientation. At the beginning, they were contacting me too often. And once, there was an issue with a big client and I came in too late. It's a matter of balance" (P.V)	C2a "I felt confident in this stimulating environment. Each time, I needed some advices or just feedbacks. I could just call and meet different engineers in the company" (L.T)
Skills development Industry and firm specific	A1b "Each time, we needed help from the technical department. They were there. This enable us to improve considerably the tightness performances of our pumps" (C.D)	A2b "The reorganization has increased our productive capability. We are much more competitive now and we can face a substantial increase in demand" "Our know-how is to manufacture small aluminum sub-components We are pretty flexible in adapting these sub-component"	B1b "Working with an American company was tedious but we've learnt a lot on how to respect strict deadlines, we had to go through all this process of reporting but it really helped at the end to improve our productive capacity" (S.B)	B2b "We have learned to work with young creatives that often refuse to work for larger ones. They are geeks that spend much time in bed in the morning but can work load of hours to develop a game during the night. We know how to work with them" (E.A)	C1b "With F.P, we are much more focused on the technical and commercial issues. We leave the management one to P.V" (A.M) "They are really good now in client negotiation. I was really impressed recently. During the final meeting, I nearly did nothing" (P.V)	C2b "In two years', time, he has developed a technical ability to develop tailor made applications for engineering. I see most potential for commercialization of those applications into the green engineering market" (P.V)
Emotional commitment	A1c "The couple works pretty well. They have complementary competencies but the big difference is that they really appreciate each other" (J.D) "I'm confident in their success. But beyond, there are feelings that you can't explain. The way you feel the guys in the project" (J.D)	A2c "If we are so dedicated in our support, it's because we really want them to succeed." "I must recognize that J.D has been very supportive all the way. I'm really grateful for that"	B1c "I think they never really accepted our collaboration with PIXEL. It was perceived as a betrayal even if there were good arguments to support us" (S.B) "I must admit that it was not easy at that time. At the end, we asked them to choose their main partner given our close linkages" (C.B)	B2c "We had a clarification meeting where we wanted to understand where they were heading. They showed us some different game prototypes and clearly, we were impressed by the universe they were developing" (C.B)	C1c "P.V is someone who has clear ideas. He has a great experience in business creation. He is not authoritative. He listens, give advice, is present when needed" (F.P) "We are in the same boat. If there is any problem, they can knock at my door. I'm here to support them" (P.V)	C2c "He is not only competent but also very human. We went very well along. I was his mentor. We met quite often during the developmental phase of the project. It was stimulating and I must say that now, we are friends" (P.V)

For example, with Buildy and its two spin-offs Ecolo and Login, such ambidextrous orchestration function is explicit. In the case of Ecolo, the spin-off was meant firstly to selectively invest in new assets where the company has initially limited market and technological know-how. After winning several contracts, Ecolo is recognized for its expertise in engineering for design or redesign of buildings in an eco-friendly way (C1a). It is positioned upstream on green initiatives in aging industrial sites that need to become more environmentally responsible due to more restrictive norms. However, to win those contracts, they need to have a well-established construction partner with a solid reputation and production capabilities such as Buildy (C1b).

Furthermore, the green engineering know-how has served to realign existing know-how on construction within Buildy: (C1c). Buildy has started to specialize in green construction with new techniques and materials that it shares with Ecolo when they are engaged in common orders. On top of that, they are also developing specific intangible assets for the whole construction process of green buildings. (C1d). Such collaborations signal knowledge sharing and transfer that permeates both entities, resulting in the development of complementary assets.

In the case of Login, the spin-off strategic intent was also to explore the market and technological potential of 3D software for engineering within the scope of Buildy. After developing a beta version of its engineering software, Login started to market the software on a professional platform but the sales figures were quite deceptive as the founder explains: (C2a). Furthermore, they lacked money for further software development. Turning to Buildy, Login founder faces strong skepticism.

In effect, there has been less collaboration than expected between Login and Ecolo (C2b). Therefore, at a certain point, the parent company might decide to keep a share in the company as an investor or it might opt for separation and divestment (C2c). Given this situation, the Login founder is encouraged by the Buildy owner-manager to look for other partners outside Buildy's actual scope.

The ambidextrous orchestration function is confirmed with the three other cases. All these spin-offs were deliberately created either to better explore complementary assets or better exploit existing ones. However, for three of them (Balneo, Login and Action), the strategic complementarities of the assets were reevaluated after a few years of operations. For two of them

TABLE 7a
The ambidextrous orchestration function for reconfiguring

Reconfiguring Supra	Mecanix (Parent A)		Gama (Parent B)		Buildy (Parent C)	
	Hermetic (Child 1)	Balneo (Child 2)	Rally (Child 1)	Action (Child 2)	Ecolo (Child 1)	Login (Child 2)
Explore complementary assets Identify new assets, make investments and refine business model	A1a <i>"We have better offers to design more complex pumping systems" (C.D).</i> A1b <i>"Our activity will shift from manufacturing to design and maintenance, Hermetic is exploring these changes upfront" (J.D)</i>	A2a <i>"I still think that they can develop strongly this activity but we won't get involved in this industry, it's out of our core business" (S.D)</i> A2b <i>"It was clear for us that Mecanix was not going to invest. They stay as a solid financial partner". (C.V).</i>	B1a <i>"It's natural for us to turn to Gama but we need to engage with other editors. We are also exploring a new project with PIXEL on an action-adventure game" (S.B)</i> B2c <i>"Our collaboration with Gama has been very fruitful. They have developed a higher productive capacity for game development and a distinctive specialization in simulation games" (C.B)</i>	B2a <i>"I think that we have it right now in terms of what we're good at and also our market position" (E.A)</i> B2b <i>"It's on standby now but we don't exclude another collaboration for another sequel. E.A and his team have a specific touch for adventure game. They have considerably increased their market recognition" (C.B)</i>	C1a <i>"We have started to work on several projects successfully for green building redesign. It's a growing market and the company is gaining rapid recognition" (A.M)."</i> C1b <i>"They are on more complex calls for tender where green engineering is valued but they need us as a construction partner" (P.V).</i>	C2a <i>"It's very competitive. We need a viral diffusion. We will release a free version so that users can see the difference." (L.T).</i> C2b <i>"At the beginning, we thought that might be a key aspect for our own engineering but this doesn't bring much difference, furthermore, it's not just about investing money, they also need fresh know-how within the field" (P.V).</i>
Exploit complementary assets Coordinate cospecialized assets, provide a vision and nurture innovation	A1c <i>"These technologies are novel. It's a competing system that will replace the old centrifugal ones on which our pumps are based" (J.D).</i> A1d <i>"If we had the productive facilities, we would have developed it (...) Mecanix is our long-standing partner, they have all the infrastructure in place for that." (C.D)</i>	A2b <i>"We thought that we could share some common activities but they had no interest in developing those systems (...) basically they stood solely as a financial partner" (C.V)."</i> A2c <i>"Mecanix is a good standing partner. Very supportive so far, now we need to make our way." (C.V)</i>	B1b <i>"We need the full expression of their creativity and they need our infrastructure. That's a perfect mix" (C.B).</i> B1c <i>"Game development requires flexible teams. For specific skills, we share some people from Gama and vice versa." (S.B)</i>	B2b <i>"The creative job is good; we are willing to think about a sequel but they have to rely on our project management system" (C.B) "</i> B2c <i>"(...) We are still eager to work together. We can bring more niche-oriented games in their catalogue. There is a big trend for specialized games" (E.A)</i>	C1c <i>"Green buildings require new types of raw materials, components and systems. It's novel for our teams, they are learning how to use them and developing construction skills" (P.V).</i> C1d <i>"We have also feedback from the field (workers) on our design choices as well as the efficiency of the different raw materials they use" (F.P).</i>	C2b <i>"It's right time for them to fly by their own wings. We've supported them so far and it was the right thing. The company has a high potential but it's outside our scope" (P.V).</i> C2c <i>"Our activity is now well established and quite distinctive from Ecolo. We know that there is a market potential for our software and it's better to be outside for the moment" (L.T)</i>

(Balneo and Login), the decision was made to further exploit the assets within a separate entity (child organization) rather than pursuing the exploration/exploitation cycle (parent-child dyad).

THE DYNAMIC MANAGERIAL ABILITIES THAT SUPPORT RECONFIGURING

At the infra (or individual) level, there is a set of dynamic abilities that owner managers and entrepreneurs exhibit to support the ambidextrous function of spin-offs as reconfiguring at the supra level. Table 7b summarizes our main findings on the two abilities that both managers and entrepreneurs exhibit: sharing visions and regulating conflicts.

Firstly, both managers and entrepreneurs have to share their visions so that they can have a common intent on assets orchestration. This is sustained by regular interactions between both parties where views on markets and industry evolution are shared, as Buidly's manager explains. (*C1a*). Such openness tends to set the stage for over-arching visions that forge a common identity, even if both entities tend to have differential strategies. It reduces the risk of either an identity separation, where both entities are on totally separate routes, or an identity fusion, where both entities are not distinctive.

Secondly, both managers and entrepreneurs develop conflict regulation abilities. This relates to specific language and communication that they can develop, as the manager of Buidly explains (*C1c*). It reveals the non-verbal communication abilities that proximity between the actors has favored. Furthermore, there are perception and attention abilities that the manager has developed to be able to sense conflicts and also resolve them quickly by offering his negotiation skills and his social network (*C1b*). It also indicates social cognition skills by inducing cooperative activity among his peers.

As expressed in our Table 7b, the two other cases provide complementary evidence to support these two main dynamic managerial competencies of both managers and entrepreneurs.

CONCLUSION OF THE RESULTS SECTION

Our results are twofold. Firstly, at a supra level, spin-off has a set of functions that supports dynamic capabilities at a supra level: namely boundary-spanning, flexible organization and ambidextrous assets orchestration. Secondly, at an infra level, the dynamic managerial underpinnings are specific cognitive, managerial and social skills shared by the owner manager and the entrepreneur. However, they leverage them differently and complementarily at an individual level that supports the foundations of dynamic capabilities at an organizational level. The combination of these dynamic managerial capabilities at a micro-level enable an efficient resource orchestration in terms of scope, speed and depth that is supportive of dynamic capabilities at a macro-level. Throughout the process, the management of emotion is a central ability for effective decision-making, as we will discuss.

Discussion

RBV is overly focused on the possession of resources and their rent-generating properties at the expense of a dynamic process of resources orchestration to create an advantage (Sirmon *et al.*,

2011). Rather than considering spin-off as a static process of resource generation from only one side, we propose a dynamic dual view on spin-offs as the inventive generation and exploitation elaboration of complementary resources for both the parent and child organizations (Christensen, 1996; Dierickx and Cool, 1989; Teece, 1986), thus leading to the foundation of their dynamic capabilities.

Building on Teece (2007) Framework, our first contribution is to demonstrate how spin-offs are micro foundations of dynamic capabilities with three key functions that are boundary spanning, flexible organizing and ambidextrous orchestration to sense, seize and transform opportunities for both the parent and the child organization.

To sense opportunities, we demonstrate that spin-off has a boundary spanning function that expands the scope of resources for both entities. For the parent organization, it is an outbound process that stretches its technological environment beyond its actual domain through the child firm enabling higher exposure and connections to relevant know-how. For the child organization facing the liability of newness, spin-off has an inbound function enabling a quicker access to market knowledge by leveraging the market experience and reputation of the parent organization for easier connections to suppliers and customers. Overall, the spin-off as a boundary spanner creates a "collective bridge" (Zhao and Anand, 2013) where previous organizational members interact with the other stakeholders outside the usual networks of the parent company. This entrepreneurial environmental scanning facilitates the resource structuring for both entities to acquire, accumulate and divest resources to form a new or rejuvenated portfolio (Sirmon *et al.*, 2011).

To seize opportunities, we demonstrate that spin-off has a flexible organizing function that combines and articulates resources quickly for both entities. On the parent organization side, it outsources the product-development capability to an autonomous entity that could produce faster and cheaper given their access to emergent technological or infrastructural assets that are often more underground and related to creative collectives or communities (Simon, 2009). On the child organization side, it leverages the market-development experience of the parent organization to reduce the risk of new product introduction within existing societal and network status (Lin, Yang and Arya, 2009). Overall, the spin-off in its seizing mode is a nearly decomposable structure (Simon, 2002) that can achieve decentralization without compromising integration. By pooling complementary assets, both entities can produce faster and cheaper than either could do alone (Deeds and Hill, 1996). Thus, resource bundling promotes the sharing of cost and risk as well as product development, while increasing speed to market (Osborn and Hagedorn, 1997).

To reconfigure opportunities, we demonstrate that spin-offs have an ambidextrous orchestration function that both explores and exploits complementary assets in a value enhancing way for both entities (Tushman and O'Reilly, 2008). The exploratory capabilities have led to new technological, reputational and commercial assets that the child organization has developed through its process of product-market development. However, the efficient exploitation of this new business model is highly dependent on the parent organization. Thus, the exploitation

capabilities have led to a new operational, financial and distribution assets that the parent organization has developed to scale product manufacturing and commercialization. Such resource dependency may be secured in contractual terms through property rights or commercial contracts. They favor collaboration between different members of both organizations favoring in-depth resource orchestration across levels. However, these hierarchical and capitalist linkages need to be over formalized to avoid the risk of stifling and subsequently suppressing innovation (Miller and Friesen, 1984) with a bureaucratic structure.

Our first contribution stands at “supra” or higher-order level by analyzing how both entities develop different resource complementarities in terms of scope, speed and depth at different stages. This offers a dual dynamic approach to the “one sided” static view on spin-offs in the literature (Itturiaga and Cruz, 2008; Sapienza, Parhankangas and Autio, 2004; Parhankangas and Arenius, 2003; Ito, 1995). However, Teece Model is still at an abstract level that conceals the roles of managers and entrepreneurs at different stages in the spin-off process. The question of how such spin-offs processes are adequately managed

given their high levels of risk remains unanswered. (Itturiaga and Cruz, 2008). Our second contribution is to complement this macro-level view with an “infra” or lower-order level by embracing the perspective of dynamic managerial capabilities.

Building on Adner and Helfat (2003) triple distinction of dynamic managerial capabilities and more recent works on managerial cognitive capabilities (Helfat and Peteraf, 2015; Hodginkson and Healey, 2011), we analyze the repertoire of cognitive skills, managerial skills and social skills that both the owner manager and the entrepreneur share in the elaboration of dynamic capabilities (Augier and Teece, 2009). For each category of skills, we demonstrate how they are leveraged in terms of scope, speed and depth either by the owner manager and the entrepreneur or both, thus completing each other at different stages of the spin-off process.

Sensing opportunities relies mainly on cognitive and social skills such as perception and attention to recognize weak signals from their environment suggesting emerging patterns of new opportunities (Baron, 2006). On the owner-manager side, his strategic-level position leads him to have a perception on

TABLE 7b
The dynamic managerial capabilities for reconfiguring

Reconfiguring Infra	Mecanix (Parent A)		Gama (Parent B)		Buildy (Parent C)	
	Hermetic (Child 1)	Balneo (Child 2)	Rally (Child 1)	Action (Child 2)	Ecolo (Child 1)	Login (Child 2)
Sharing visions Common language, verbal and nonverbal communication to build an overarching vision	A1a “We have agreed that Mecanix would set up a specific manufacturing line for their canned pumps with Hermetic’s monitoring” (J.D)	A2a “We are shifting from a component manufacturer to integrated SPA sub systems (C.V)” A2b “We had a meeting with the new management and we explain the story and what we were doing now. This was important to share so that they could decide” (C.V)	B1a “We have regular updates and information on the markets and the sales volume, we are also entitled to respect the deadlines and do some reporting of our activities. It works well because we trust each other” (S.B).	B2a “He is now so involved in the financial affairs of the group (...) that we barely see him now. It’s a pity but the company has grown too quickly... the financial aspects are so central (...) We feel uncomfortable to tell frankly those things” (C.B)	C1a “Our industry is changing with a larger scope for new services and products. We need to embrace that. There are new domains where we were never expected to be. Now, we have to learn. I’m expecting them to come to me and tell me clearly. We need to include this activity.” (P.V)	C2a “We have now redefined the main activities of Login. It’s software development for green engineering. It covers commercial and industrial areas such as waste management” (P.V)
Regulating conflicts Negotiation and Social skills to resolve identity issues	A1b “They did nothing to promote our pumps. They have always been against this technology. I told J.D that if this doesn’t change, We’ll move out.” (C.D). A1c “His Greed sometimes irritates us (...) but he has always been here, when we needed him” (C.D)	A2c “At some point, there was a big change in management and J.D left. It was difficult for us because they misunderstood our added value. Fortunately, the purchasing manager was still there and he helped us argue to renew our contract” (C.V) A2d “This period was somehow complicated for them because of our deep understanding of each other. With new management, we had to put forward stronger arguments to sustain our collaboration” (C.V)	C2b “They have always been uneasy with our collaboration with PIXEL. At some point, they wanted exclusivity. We don’t want that. If this there is too much pressure, we’ll move out” (S.B) B1c “We just had different point of views on the future of Rally. We wanted them to stay within the group as a distinctive company rather than being totally independent. Well, we had good arguments. It’s up to them to decide.” (C.B)	B1c “We have been supportive (...) we expected them to be more reliable and be more open when problems arose but they kept their shop secret.” (C.B) B1d “We had problems with the marketing and sales department. (...) never understood our style and how to market that (...)” (E.A)	C1b “We could have missed this opportunity with a key customer due to a lack of diplomacy. Fortunately, they came to me. They missed that it’s not only about competency, networks are essential. I took the lead and open my address book; we lobbied our offer and won the contract” (P.V) C1c “We have close relationships. We know each other quite well. They had big issues with a client and wanted to resolve that by themselves. I knew something was going wrong. So, I came to them and I insisted that I could help. (...)” (P.V)	B1b “We a big disagreement when he wanted to diversify the activities to become a distributor of software for engineering. I told him it was a mistake and refused to support such initiative. We stood on our position for a certain time. Then we had a serious talk and we found an agreement to refocus the main activities of Login on green engineering” (P.V)

opportunities whose scope revolve around the fitness between the parent organization set of resources in line with technology and market trends in the industry. The temporality of his perception on opportunities is also more on the long run. On the entrepreneur's side, their operational-level position devotes more focused attention to specific technological or market patterns that could be acted upon quickly through short cuts and the limited resources of the child organization. Therefore, perception is narrower in scope and attention is quicker to rapidly act on trends to turn them into opportunities. Overall, the perception and attention of both protagonists are supported through their social capital. By virtue of his position, the owner manager has a larger social capital with weaker ties with varied and different signals. On the entrepreneur side, their social networks may be more limited but they usually have stronger ties in social circles with more expert information. Such combinations are complementary to support groundbreaking connections in different domains. Finally, spin-offs are effective boundary spanning processes because individuals with different cognitive styles (Hodgkinson and Clark, 2007) have created a space to express thoughts, feelings and emotions on their perceptions of opportunities, thus unlocking the exploration scope of the organization.

Seizing relies mainly on a combination of managerial and social skills such as recruitment and team-building abilities with novel combinations of human capital with diverse industry or company related experiences (Adner and Helfat, 2003). To facilitate such fruitful connections, the owner-manager taps in social networks that are more internally-oriented within the scope of the parent organization and its partners, whereas the entrepreneur will tap into social networks that are more externally oriented around the communities of practice within or across industries. Here, both owner managers and entrepreneurs have developed an in-depth attention not only on rational grounds to sense the technical fitness between people but also on emotional grounds to sense the social fitness that eases collaboration. Such ability to recognize affective signals and use them as information is central (Slovic *et al*, 2004; Finucane *et al.*, 2000) to shaping opportunities through quick, emergent and holistic connections (Dane and Pratt's, 2007). As suggested by the window metaphor, seizing an opportunity is a short time slot that opens up when there are positive evaluations of markets and technological trends that could be acted upon given the resources that are available (Baron, 2006). When such connections appear, there is a central passage to opportunity seizure that opens up. Spin-offs is an efficient flexible organizing process to seize opportunities when individuals demonstrate strong emotional commitment by stimulating strong, clear and positive images related to new opportunities through scenario building, for instance, to engage people (Healey and Hodgkinson, 2008) and leverage resources to support their exploitation.

Reconfiguring is supported primarily by social and managerial skills such as networking and conflict regulation abilities. Given the internal orientation of their social ties, owner managers tend to encourage interactions between different members of the child organization and the parent organization to reinforce interdependence. Given the external orientation of their social capital, entrepreneurs tend to favor interactions with outsiders in other social circles to develop autonomy. Balancing internal and external social capital (Adler and Kwon, 2002) is a central activity for both entrepreneurs and owner managers as

spin-offs are recognized as key processes that involve identity changes and transformation. They usually involve major changes that threaten the identities and self-concepts of managers and employees (Gioia, Shultz & Corley, 2000) and also their power relationships as the social structure of the child organization evolves. Consequently, conflicts may arise and their resolution depends on a set of cognitive and social skills. On the owner manager side, there is perception and attention to non-verbal signals that reveal emerging tensions within the entrepreneurial team or in the relationship with other members of the parent organization. When such signals appear, the owner manager can resolve them more efficiently if the entrepreneurs have the possibility to express verbally their feelings and emotions. Listening and communication abilities are thus central here. On the entrepreneur side, it is their ability to discuss and negotiate directly and openly with the owner manager to make sure that they still have a common strategic vision and a common intent on assets orchestration. Spin-offs are an effective ambidextrous orchestrating process if individuals are able to find a continuous power balance between autonomy and interdependence. Capitalist and hierarchical linkages play a moderating role on this relationship. As they increase, the child organization may lose their power and increase their interdependence on the parent organization. On a technical side, this may favor inter-assets specificity and co-specialization but it's a double-edged sword as it may also reduce the innovativeness of the spin-off by creating too much power dependence.

Our second contribution stands at an "infra" or lower-order level by analyzing how the main actors of spin-offs leverage a set of complementary dynamic managerial capabilities that are more people-oriented. It's the human bases of dynamic capabilities drawing attention to who and how individuals are supportive of dynamic capabilities at a "supra" level via the three functions of spin-offs that are boundary spanning, flexible organizing and ambidextrous orchestration. This is also a more detailed approach on the adequate managerial actions at each stage to resolve the paradoxes of spin-off management given the risk associated to managing such processes where key assets are not totally controlled nor possessed (Itturiaga and Cruz, 2008).

Conclusion

The Micro Foundation View intends to complement the dominant macro organizational approaches on dynamic capabilities by investigating how the individual's interaction at work creates resources and develops competencies that combine into routines and capabilities. In the context of rapidly evolving organizations and markets, such processes are constantly being enacted to sustain an evolutionary fitness, thus capabilities become dynamic. Our investigation of spin-offs reveals how such processes engaging different actors interacting regularly from scratch (lower level) leads to the creation, combination and reconfiguration of assets. Our contribution is twofold.

Firstly, we tackle this concept by furnishing empirical cases of spin-off processes that have contributed to the foundation of dynamic capabilities in the context of rapidly growing SMEs. Building on Teece's Framework (2007), we analyze how spin-offs can contribute to the foundation of the three meta-capabilities that are sensing, seizing and transforming.

Secondly, in that dynamic managerial perspective (Adner and Helfat, 2003), we further analyze the managerial and entrepreneurial underpinnings of spin-offs as foundations of dynamic capabilities at an infra level. This reveals a set of cognitive, managerial and social skills for each mode.

Overall, we can argue that spin-offs can be relevant micro processes for dynamic capabilities due to their ambivalent nature that furnish a stimulating context and process for creating resources and capacities for evolutionary fitness (Helfat et al., 2007). It offers a micro foundation view by focusing the set of enterprising individuals interacting within and outside the company, building on past knowledge on the parent company and extending this basis with new knowledge on the market.

However, the main limit of our research is that these spin-offs belong to different industries, which may have different life cycles and technological paths. We haven't explored such difference and its impact on the dynamic capabilities prioritizing a process and internal view on its foundations. However, this offers interesting avenues for research. For instance, during the growth phase of an industry, the spin-off rates may be higher as the scope of opportunities will be larger with a larger array of technological and market trends that a rapidly growing SME has neither the time nor the resources to explore. In such contexts, spin-offs may be suitable to explore and exploit within-industry complementary assets for innovation. In the mature phase of an industry, the spin-off rates are generally lower, but there might be a transfer and exploitation of some assets into other related industries. In such contexts, spin-offs may also be relevant to explore and exploit related-industry complementary assets for rejuvenation.

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