M@n@gement

ORIGINAL RESEARCH ARTICLE

Scapegoating in the Organization: Which Regulation Modes?

Mélia Djabi[1]* and Oriane Sitte de Longueval[2]

[1]University of Paris Saclay, Sceaux, France
[2]University of Geneva, Geneva, Switzerland

Abstract

Several studies have focused on scapegoating in the organizational context. However, most have tended to enclose the protagonists in predefined roles: scapegoats are relatively passive, their colleagues persecute them, and management quickly join the persecutors. According to this scenario, the outcome ends irrevocably with the scapegoat's isolation. The literatures in related fields have nevertheless suggested other modes of regulation, and we might question whether our representation of the organizational scapegoating process, from passive actors to automatic outcome, offers a full account of this complex phenomenon as it unfolds and is lived. We in fact do not know how organizational actors regulate the scapegoating process, interfering with and influencing its trajectory and outcome. In this article, we conceptualize this complex process by examining the active and regulating roles of its protagonists and how they hinder or even avert the violence of scapegoating. In an exploratory and qualitative study of seven cases of scapegoating in a large French company, we describe the actions of the scapegoats (combating the persecution, struggling against stigma, avoidance, and departure) and management (support for persecutors, support for the scapegoat, and ambivalent support). The articulation of the protagonists' actions ultimately leads to four types of resolution for the scapegoat: isolation, expulsion, cohabitation, and assimilation. Two modes of regulation emerge: the first mode strengthens and catalyzes the scapegoating process, whereas the second mode prevents and channels it. By detailing the actors' actions and their capacities to co-regulate the scapegoating process, this study moves beyond a deterministic vision of scapegoating and underlines the role of its protagonists. A research agenda is discussed.

Keywords: *Scapegoat; Collective persecution; Ostracism; Regulation; Stigma; Violence at work*

Handling Editor: Stéphan Pezé. Received: 1 October 2017; Accepted: 28 October 2019; Published: 2 June 2020

While on his way to meet his fiancée, Joe Wilson was arrested by the police and accused of kidnapping a little girl. The local citizens, quickly whipped into a state of hysteria by a few rabble rousers, stormed the jail in which he was being held and, in a surge of primitive justice, set it on fire. The crowd's violence was ignored by the authorities and ended up contaminating the pre-designated victim, who became overwhelmed by a desire for revenge. Inspired by an authentic news item, this story is recounted in the film *Furie* (1936), directed by Fritz Lang and starring Spencer Tracy. Disturbing because of the mirror it holds up and resonating still through the much later laws addressing the contagion of violence (Tarde, 1993 [1890]), this event is a sober reminder of the propensity of human groups to sacrifice scapegoats when inflamed by fear and anger.

A common term today, 'scapegoat' is the figurative designation of "a person to whom we attribute all wrongs" (Littré, p. 1342). The expression has its origins in the Judeo-Christian tradition of *Yom Kippur* transcribed in the Old Testament (Leviticus 16). This expiatory ritual consisted in loading a goat down with the sins of the people before driving it into the desert burdened with the community's sin. Thus, embodying evil, the scapegoat also denotes a process of stigmatization, incrimination, violence, and ultimately exclusion (Girard, 1982). In this article, we use both the terms 'scapegoat' and 'scapegoating' to distinguish those who have become scapegoats and the process exerted on them.

As the founder of the Observatory on Scapegoating and Institutional Violence affirmed (Casanova, 2014a), all eras and places, all functions and statutes, are *a priori* affected by

***Corresponding author:** Mélia Djabi, Email: melia.djabi@u-psud.fr

scapegoating. Scapegoats are found in most social groups (Gemmill, 1989), and organizations are no exception. When scapegoats are outside the group (e.g., Europe, the competition), they help strengthen the group to face a common enemy (Tajfel, Billig, Bundy, & Flament, 1971). Yet scapegoats within the group threaten its entropy and therefore deserve numerous types of violence, with negative consequences for both the target (e.g., loss of motivation and self-confidence, depression, anger, anxiety, psychological disorder, alcoholism, work accidents, and suicide) and the organization itself (e.g., deteriorations in interpersonal relationships, the working climate, productivity, and production quality) (Chappell & Di Martino, 2000). To meet their obligation to protect employees (article L. 4121-1 from 1 to 5 and seq. of the Labor Code), employers have to be able to assess and prevent the emergence of psychosocial risk factors in the workplace (Bodier & Wolff, 2018; Gollac & Bodier, 2011). One of these factors is the violence affecting the scapegoat. Furthermore, according to a report from the National Research and Security Institute (2018/2015)[1], maintaining good interpersonal relationships within the organization and preserving employee health goes far in avoiding the many economic costs that their degradation entails.

Although scapegoating obviously occurs in organizations (Bonazzi, 1980), analyses in this context remain rare. A few dedicated studies (Boecker, 1992; Bonazzi, 1983; Danniau & Meynckens-Fourez, 2015; Daudigeos, Pasquier, & Valiorgue, 2014; Eagle & Newton, 1981; Uhalde, 2005) have nevertheless specified the characteristics, uses, stages, and protagonists of scapegoating in organizations. The reactions are described as typical and predetermined by the protagonists' roles. According to these studies, the scapegoats, even when they defend themselves, fail to shake off their victim status and even at times unwittingly strengthen it (Eagle & Newton, 1981; Gemmill, 1989). Meanwhile, the persecuting collective engages in a frenzy of violence that will not stop until the scapegoat has been sacrificed, and the witnesses, including management, systematically join the persecutors (Bonazzi, 1980; Casanova, 2014b; Girard, 1982). Research on similar phenomena, which has addressed certain aspects of scapegoating (such as stigmatization, collective persecution, and ostracism), nevertheless suggests that the protagonists can actually carry out a number of adjustment actions. We know little about how these actions are arranged over the process of scapegoating and how they modify the outcome. In order to shed light on this gray area, we conducted an exploratory study to address the following question: how do the protagonists in the scapegoating process contribute to regulating the phenomenon?

To answer this question, we examined seven cases of scapegoating. All were collected in an organization called FERR, which was undergoing profound changes (managerialization of the company, feminization of job positions, rejuvenation of collectives, etc.) that had precipitated a collective experience of crisis (Uhalde, 2016), thus offering fertile ground for the emergence of scapegoats (Bonazzi, 1983; Daudigeos et al., 2014; Eagle & Newton, 1981; Gemmill, 1989; Girard, 1982; Uhalde, 2005). This multi-case and processual study (Langley, 1999) reveals four outcomes of scapegoating and two opposite modes of regulation. The first outcome catalyzes and strengthens the phenomenon (the isolation or expulsion of the scapegoat), whereas the second outcome channels and hinders it (cohabitation or reintegration of the scapegoat). The regulations leading to these outcomes are identified from the articulation of the protagonists' actions.

This research enriches the literature on organizational scapegoating in three principal ways. First, it reveals how scapegoating is regulated in the organization and its diverse outcomes, thereby challenging the current theoretical assumptions (Girard, 1982). Second, it offers a more situated reading of how scapegoating targets emerge, which should prompt continued investigation into the personage of the scapegoat and the context in which the status emerges. Finally, the study details the actions of the protagonists and how they co-regulate the scapegoating process, thereby opening the way to a less deterministic understanding of the process.

In the first section, we present the literature on scapegoating in an organizational context and the reactions of the protagonists (scapegoat, persecuting group, and witnesses). Next, the methodological approach and the results are presented. Then, we discuss the main contributions and limitations of the study and, finally, conclude with an agenda for future research.

Scapegoats and the organization: State of knowledge

We first introduce the scapegoat archetype in the social sciences, mainly developed in anthropology and psychology. We then describe its features in the organizational context.

The scapegoat archetype in the social sciences

Seminal thinkers in anthropology (Frazer, 1981; Girard, 1982) and social psychology (Berkowitz, 1962; Dollard, Miller, Doob, Mowrer, & Sears, 1939; Douglas, 1995; Eagle & Newton, 1981; Gemmill, 1989) have investigated scapegoating. The former

[1] *Risques Psycho-Sociaux (RPS)* published by *l'Institut National de Recherche et de Sécurité* (INRS) in 2015 and updated up until 2018, available online: http://www.inrs.fr/risques/psychosociaux/consequences-salaries.html.

considered it an archaic mechanism of ritualized sacrifice to contain human violence and thus preserve social order. The latter focused more on the psychosocial dynamics that drive small threatened groups to displace and distance one of their members and the anxiety aroused by interpersonal and intrapsychic conflict. From both perspectives, scapegoating is seen as a cathartic mechanism of displacing evil onto a single victim (an individual or a group) or a set of victims (a group or a society) that is often denied. The term thus designates "the innocence of the victims, the collective polarization against them and the collective purpose of this polarization" (Girard, 1982, p. 60). Scapegoating is a process, which Casanova (2010, p. 107) defined as "more or less ritualized, of exclusion and substitution, often of expulsion and expiation." He added that "its embodiment […] provides the group momentary reconciliation by drawing sufficiently strong and unanimous violence to it" Casanova (ibid, p. 107). These studies have shed light on the methods of selecting scapegoating victims and the stages that define the process.

First, scapegoats are sacrificial victims: this status removes responsibility from the group by attributing the dysfunction of an entire system to the inadequacy of an individual (Eagle & Newton, 1981; Gemmill, 1989). Although the victims may have nothing to do with the turbulence threatening the collective, they are considered responsible for it. Their sacrifice unleashes the internal and endemic violence (expiation) of the group onto a single target, leaving the group more peaceful and cohesive at the cost of a 'lesser harm' (Girard, 1982). In this case, scapegoats are partially or completely innocent of the evils they are accused of (Girard, 1982). Nevertheless, they are chosen as they bear distinctive signs that actually become victimizing over the course of the process. These signs equate the victims with the threats weighing on the collective and thus are at the root of their stigmatization. According to Goffman (1975 [1963]), the stigmas of scapegoats can be defined as those social and/or physical attributes that others consider deeply discrediting. Empirical studies have thus observed that scapegoats tend to be isolated because they are considered as non-conforming or deviant within the social body (Girard, 1982) or group (Eagle & Newton, 1981). Finally, scapegoats tend to stir up and attract the persecution of their collective before finally being excluded.

These studies have also helped to specify the stages of scapegoating. Although the number of stages differs with the level of detail adopted by the authors, the trajectory of scapegoating remains more or less the same. The sequence is generally the following: a crisis emerges and disrupts the situation, a scapegoat is chosen, the scapegoat is sacrificed, and a new social order then emerges. The crisis is *undifferentiating,* according to Girard (1972, p. 24), because it "effaces or telescopes the hierarchical and functional differences," and this carries the risk that the violence will become "all against all," which would lead the collective to self-destruction (Girard, 1982), even if this remains only fantasized. If the cause for the crisis cannot be accessed or there are multiple causes, the scapegoat is selected to serve as an "accessible cause" (ibid., p. 28) for a group convinced that "a small number of individuals, or even one, can be extremely harmful to society as a whole, despite their relative weakness" (ibid., p. 27). Little by little, the crisis seems to take on a shape that reflects the potential victim's signs: someone who may have been invisible but who seems to be emerging as a 'consensual' victim, distant enough to be sacrificed without disturbing the social ties in place and close enough to provoke a catharsis. Emergence thus proceeds from the stigmatizing of someone's characteristics as so many signs of guilt. Instinctively, the choice is directed toward those individuals who are part of the social fabric though somewhat marginal, usually a member of a minority or any group that is poorly integrated or simply different (Girard, 1982). Blaming the victim satisfies the social need for responsibility and signals that the cause of the problems has been found. This selection step is followed by a stage of violence unleashed on the now designated scapegoat, who is partially excluded and isolated by the collective (Girard, 1982). During this stage, scapegoats systematically act as if they were actually guilty of the alleged wrongdoing (Eagle & Newton, 1981; Gemmill, 1989). For example, they use the first person singular to defend themselves against accusations rather than placing the problem in its broader context, which tends to justify the sacrifice in progress (Gemmill, 1989). At the same time, the collective, while saying it disapproves of the scapegoat's behavior, encourages it through its own behavior (Eagle & Newton, 1981) and engages unanimously and unequivocally in persecuting this victim. Similarly, witnesses systematically join the persecuting collective for fear of being the next target (Girard, 1982). Finally, distancing evil and fear by circumscribing them in the person of the scapegoat signifies the new prohibitions to the group so that it can recover a sense of harmony. Sacrificing the scapegoat thus puts an end to the initial crisis until the advent of a new crisis (Girard, 1982).

Scapegoats in the organizational context

The archetype presented in previous section helps us to specify the functions, contours, and stages of scapegoating within the framework of a society or a small group. Yet, one might still ask how this archetype can be transposed to the organizational field. Organizations are a special case in that they predefine the contours of work collectives and assign productive powers, functions, and objectives to its members. This suggests that the scapegoating process is expressed and unfolds differently. Drawing on the seminal works cited above, several studies have analyzed the phenomenon in the organizational context: public administrations (Bonazzi, 1980, 1983),

management committees (Boecker, 1992), educational (Casanova, 2014b) and medical (Danniau & Meynckens-Fourez, 2015) settings, multinational companies (Daudigeos et al., 2014), and situations of managerial modernization (Uhalde, 2005). The characteristics of the scapegoating victim in organizations have thus been described.

Sacrificial victims in organizations can be functionally responsible without being factually guilty. Studies have frequently observed that organization members will unjustly accuse a member of being officially responsible for an incident, even though they are aware that this individual could not have foreseen the incident unfolding as it did or did not have sufficient powers of action to prevent it. However, the individual is at the very least accepted as a symbolically cathartic sacrifice (Bonazzi, 1980). In brief, although the persecuting group is aware of the victim's limited guilt, in their eyes he or she is sufficiently involved in the organizational crisis to be found credibly guilty (Daudigeos et al., 2014). Naturally, in an organizational context, this is a symbolic sacrifice, although it may result in a social death for the vilified and isolated victim.

The next stage of stigmatizing scapegoats concerns certain types of people typically seen in organizations. The literature has notably identified executives (Boecker, 1992; Bonazzi, 1983; Daudigeos et al., 2014), managers outside the classic career path, women working in male-dominated professions, those individuals who tend to take a critical stance regarding the realities of the job or who are physically or ideologically distant from the other organizations' members (Leymann, 1996; Lhuilier, 2002; Sigaut, 1990), and those with certain types of professional activities (e.g., managers, operators, and union representatives) and age groups (e.g., 'young' and 'old') (Uhalde, 2005). Conversely, scapegoats may represent an organization in need of reform whose members seek to distinguish themselves from the one who resists change (Boecker, 1992; Bonazzi, 1983).

Last, persecution in the workplace has unique features. While anthropologists and psychologists usually see persecutors as an emerging and autonomous whole, the boundaries of the organizational work collective are partially imposed in terms of the activity (shared work activity) and space-time (shared workspace and times). Moreover, the expression of organizational persecution can be specified. Although studies of workplace violence – addressing harassment, mobbing, and bullying (for a literature review, see Branch, Ramsey, & Barker, 2013) – generally take little account of its collective dimension (Pinto, 2014), Leymann's (1996) study is an exception. According to this author, 'mobbing' refers to the hostile words and actions (e.g., spreading rumors, taunting, sidelining, ignoring, discriminating, harassing, etc.) expressed or manifested over a long period of time by a group of people (Leymann, 1996). It is precisely the repetition that constitutes the violence, especially since, in an organizational setting, victim and persecutors see each other regularly because of the work. In addition, the victim's exclusion has been described by studies on workplace ostracism (social exclusion and sidelining), wherein the victim remains in the collective while being physically and/or socially excluded (Lhuilier, 2002), an example being the refusal to recognize the person when it would be appropriate to do so (e.g., not greeting him or her) (Robinson, O'Reilly, & Wang, 2013). However, these studies did not consider the scapegoat's function as a sacrificial surrogate.

The general and organization-specific characteristics of scapegoats are summarized in Table 1.

In an organizational context, the stages of scapegoating can also be specified. Studies have generally noted that the crisis triggering the process is "a qualitatively different moment compared to the normal operating conditions of a system" (Bonazzi, 1980, p. 303). It has been successively described as a crisis in the legitimacy of power (Bonazzi, 1983) or as an economic (Boecker, 1992), identity (Uhalde, 2005), or media (Daudigeos et al., 2014) crisis. In this context of organizational anomie (Uhalde, 2005), the actors are subject to external

Table 1. Archetypal characteristics of scapegoats in the organization

Characteristics	Associated notions and definitions
Sacrificial	**Innocently guilty:** The scapegoat is partially or completely innocent in the eyes of those affected by the crisis (Girard, 1982) but plays a sufficiently significant role for his or her guilt to be credible, according to the persecutors (Bonazzi, 1983; Daudigeos et al., 2014). **Sacrifice:** "The entire community turns against the sacrificial victim. The sacrifice dispels the seeds of dissension within the community by keeping the focus on the victim" (Girard, 1977, p. 18).
Stigmatized	**Stigma:** "An attribute that is deeply discrediting" (Goffman, 1975 [1963], p. 3). An element of 'personal identity' (what we are visibly, what emerges from us as signs) that upsets the 'virtual social identity' (the role that we were supposed to play in the public eye), disqualifying a person by revealing a 'real social identity' (which one then really becomes in the public eye) that is depreciated (Goffman, 1975 [1963]).
Persecuted and excluded	**Workplace mobbing:** "A chain of hostile words and actions repeated over a fairly long period and expressed or manifested by one or more people toward a third person" (Leymann, 1996, p. 27). **Workplace ostracism:** when "an individual or group omits to take actions that engage another organizational member when it is socially appropriate to do so" (Robinson et al., 2013, p. 206).

injunctions to constrain their actions at the expense of the rules organizing the social body (Reynaud, 1997[1989]). We therefore examined scapegoating as a way for organizational actors to recover power as they cope with the indeterminacy imposed by a crisis. According to this reading, the selection and persecution of the scapegoat can be read, respectively, as personifying and confronting the crisis at the moment when actors are looking for room for maneuver in the organization.

Furthermore, the scapegoat and persecutors in an organization are supervised by managers, who may well witness the persecution (when the scapegoat is part of management, the witnesses are the higher-ups). According to the literature, these managers systematically incriminate the scapegoat as well for fear of becoming the next target (Bonazzi, 1980; Casanova, 2014b; Leymann, 1996), thus adding to the violence. Bonazzi (1980) also notes that scapegoats are inevitably sanctioned by management. In this way, management tacitly approves the collective retribution and thus eliminates any possibility of the victim being rescued.

Table 2 illustrates the different stages of scapegoating in an organizational context based on the literature, particularly drawing on the seminal work of Girard (1982).

Yet several points require greater exploration when scapegoating occurs in an organization.

Although the seminal works have described the reactions of the scapegoating protagonists as predefined and invariable, leading inexorably to the persecution and exclusion of the victim, the state of knowledge about related phenomena of workplace violence and exclusion (stigma, collective violence, ostracism, and sidelining) suggests that many actions can be implemented by protagonists, in line with the cognitive-emotional approach of Lazarus and Folkman (1984). Cusin and Maymo (2016) thus observed that the protagonists had a certain latitude in decisions about stigmatization. The targets of collective violence and ostracism, for example, can put into place strategies for fight or flight (Grima & Muller, 2006; Zapf & Gross, 2001) and avoidance or denial (Dehue, Bolman, Völlink, & Pouwelse, 2012), which are partly dependent on their social support systems and opportunities for escape (Grima & Muller, 2006; Lhuilier, 2002). Notably, some manage to return to their initial status within the collective (Wu, Yim, Kwan, & Zhang, 2012).

Studies on how the victims of violence and exclusion react have also raised questions about the inevitability of scapegoating, also noting a variety of actions on the part of all the protagonists. However, we have little understanding of how these actions interfere during the scapegoating process and shape its course. Therefore, the purpose of this study was to explore the process in the organizational context to determine the underlying modes of regulation. Regulation, understood in the social sense ('management of the phenomenon by the organizational actors'), refers to the way actors behave and interact to negotiate the social order in order to manage conflict (Reynaud, 1997[1989]). The combination of protagonists' actions should therefore lead to different forms of regulation, which we sought to identify and characterize.

Methodology

This research was intended to be comprehensive, qualitative, and interpretative (Sandberg, 2005). It was based on the processual analysis of seven cases of scapegoating in a state-owned enterprise called FERR. The research design is presented in the following sections.

The field of study

In the mid-1990s, FERR, a state-owned rail freight enterprise, shifted to New Public Management (NPM) (Pichault & Schoenaers, 2012), as have most public organizations (Kuipers et al., 2014). However, NMP has made it more likely that workplace violence will emerge (Abord de Chatillon & Desmarais, 2012). Within the company, this change precipitated profound organizational, strategic, structural, technological, and cultural transformations. At the strategic level, the 'customer orientation' initiated in the late 1990s marked the transition from integrated management to 'management by product'. Structurally, production was reorganized by activity, resulting in the merger of previously separate establishments. Technological changes resulted in the reconfiguration of workspaces and the transfer of agents to computerized referral stations. Finally, a technical culture was gradually replaced by a more commercial culture. These changes, prescribed, impersonal (Miossec, 2011), and directed (Autissier, Vandangeon, & Vas, 2010), gave rise to new operating rules and

Table 2. The stages of the scapegoating process in an organizational context

Initial situation	Crisis emerges	Scapegoat chosen	Scapegoat sacrificed	New social order
The crisis is invisible, and distinctive signs are not stigmatized. The collective lives in harmony.	The crisis threatens the established order and sets members of the collective against each other. Victimizing signs begin to emerge.	The collective spots a consensual victim. The victim is **stigmatized** and found guilty.	The collective **persecutes** the victim, who cannot defend himself/herself and is held in a socially 'in-between' space. Management rallies around the persecutors.	The threat has been personified and is held at a distance. The collective lives in temporary harmony due to the scapegoat's **sacrifice**.

profoundly modified the organization's cultural framework (Sainsaulieu, Francfort, Osty, & Uhalde, 1995). In addition, NPM has led to a weakening of social regulations and produced an uncertain and worrisome climate for many employees who were often deeply invested in their work and the organization (Rondeau, 2008). Indeed, this climate has even been described as reflecting a collective experience of crisis (Uhalde, 2016) in the sense described by Girard (1982). FERR had initially been chosen to study workplace socialization and inclusion/exclusion, with two separate surveys of a targeted sample (Lincoln & Guba, 1985) of about 50 employees exposed to these organizational changes. Yet it also proved to be a breeding ground for another phenomenon: scapegoating.

A multiple-case study

Our 'amplified' analysis (Chabaud & Germain, 2006), which combined our initial data set (related to workplace socialization and inclusion/exclusion) and a supra-analysis (Heaton, 2004) based on this new theoretical reading, enabled us to identify several cases of scapegoating. We therefore chose to perform a multiple-case study (Yin, 2009) in order to superimpose the findings and gain new insights into this little explored phenomenon. By doing so, we were able to limit the risk of equifinality that all qualitative research entails (Dumez, 2013) and circumvent some of the difficulties of accessing the phenomena of scapegoating (Desmond & Kavanagh, 2003; Gemmill, 1989; Girard, 1982), which is often denied and thus is difficult to question directly.

Despite the difficulties of our undertaking (Langley, 1999), seven distinct cases of scapegoating (referred to from A to G) were distinguished within five separate work collectives. Each case was distinct (Moriceau, 2003) but showed typical features (Ayerbe & Missonier, 2007) of scapegoating as identified in the literature: a victim who was sacrificed because he or she was found guilty of a change she was not responsible for despite having little power of action over it (e.g., a new woman driver symbolizing, against her will, the decline of the masculine culture of the driving profession and its feminization); stigmatized by the collective, which indicates that some of the victim's attributes were emblematic of the change taking place (e.g., stigmatizing the 'private language' of an executive from a prestigious school, symbolizing the company's privatization); and persecuted because he or she was systematically abused and excluded by this collective (e.g., shunning, collective, and systematized verbal violence).

Collected data

As part of the initial studies on workplace socialization and inclusion/exclusion, data were collected from several sources (e.g., interviews, observations, and secondary data), but the main method of collection was the semistructured interview. Individuals were asked about changes in their work and within their collective, as well as their daily problems with adjusting to the changes.

Among the 13 collectives we studied, five harbored cases of scapegoating clearly identifiable from the retrospective accounts provided by the collective members. In all, seven cases of scapegoating were identified, two collectives (1 and 5) having experienced the phenomenon twice. These collectives varied in size, ranging from 10 to several dozens of people, depending on the local organizational context and the working hours (day/night).

The cases concerned 17 of the people encountered for the initial data set. Most were interviewed twice (6–13 months apart) between 2012 and 2015, using a diachronic approach. This sample was made up of local workers and managers performing in a variety of job positions (e.g., schedulers, signal system technicians, brake operators, and train drivers).

The characteristics of the sample and the seven cases are detailed in Table 3.

Legend: (1) Names: D, director of unit; M, Frontline manager; O, operator. Those whose names appear with an * were mentioned by the interviewees but were not interviewed. (2) Protagonists: S, scapegoat; P, persecutor; W, witness.

During the interviews, the dynamics of the scapegoating were recounted either retrospectively (in full at a single collection point) or as the process progressed (in the form of key steps at each of the two collection points). The intersection of lived experiences and the researchers' viewpoints helped us to intersubjectively distinguish (Suddaby, 2006) each scapegoat's experience from that of the persecutors and witnesses. Three of the cases were reported by the three protagonists (A, C, and D) and the other four by two of them (E, F, G, and B) due to the space–time restrictions of the study (e.g., the victim obtained a transfer). However, their nature was confirmed during informal discussions with several collective members. The interviews lasted for 90 min on average and were fully recorded and transcribed. The many informal and fortuitous discussions before and after the interviews often consisted of 'frank' talk about these situations, which was included in the data analysis.

These data were supplemented by observations by one of the researchers at the time of the initial investigation. Within the framework of an action research project, she had joined a working group of human resources employees and union representatives and was responsible for helping the members to get a handle on the changes in job descriptions and issues of inclusion/exclusion within the various work collectives. On this occasion, the interactions were documented, and the key informants were interviewed (e.g., senior executives, station managers, a human resources manager, local managers, and train drivers). The interviewees provided

Table 3. Characteristics of the sample and cases

Case	Team and context	Name	Protagonist	Job	Date, type, and volume of collected data
A	**Collective 1** Collective of signalers for switching train tracks. Computerized switching junction in South-East France. Working alone, collective break room.	M1	B	Firstline manager	09/2012–04/2013 Interviews (M1, O1a,b) Interview with the manager of rail traffic (key informant) Internal documentation on job developments (10,000 words)
		O1a	P	Signaler	
		O1b	T	Signaler	
B		D1*	B	Manager	
		O1a	P	Signaler	
		O1b	T	Signaler	
C	**Collective 2** Collective of agents who organize train departures from the platform. Stable teamwork in the Paris region.	M2	B	Firstline manager	10/2012–04/2013 Interviews (M2, O2a,b) Observations Excerpts of internal communication campaigns on job developments (6,000 words)
		O2b	P	Railroad operator	
		O2a	T	Railroad operator	
D	**Collective 3** Collective of agents who carry out movements of rails under repair. Highly unionized. Working in rotating teams (2 × 8) in the Paris region.	M3a	B	Firstline manager	06/2012–03/2013 Interviews (M3a,b,c, O3a,b,c) Interviews with the head of the establishment (key informant) Interview with a human resources manager (key informant) Observations (2 days of learning about jobs) (18,000 words)
		M3c	P	Firstline manager	
		O3a	P	Railroad operator	
		O3b	P	Railroad operator	
		M3b	T	Firstline manager	
		O3c	T	Railroad operator	
E	**Collective 4** Collective of highly unionized train drivers. Solitary and mobile work. National scope.	O4a	B	Driver	05/2015 Interviews (O4a,b) Interviews with other drivers and firstline managers (key informants) Excerpts of external communication campaigns and meeting minutes (10,000 words)
		M4*	T	Firstline manager	
		O4b	T	Driver	
F	**Collective 5** Collective of agents who organize train departures from the platform. Highly unionized. Stable teamwork. Lyon region	O5b*	B	Signaler	10/2012–04/2013 Interviews (M5, O5a,c) Internal documentation on job developments (7,000 words)
		O5c	P	Signaler	
		M5	T	Frontline manager	
		O5a	T	Signaler	
G		O5a	B	Signaler	
		O5d*	P	Signaler	
		M5	T	Frontline manager	

valuable information on the contexts of crisis, and all interviews were also recorded and transcribed in full. Finally, this active presence in the field made it possible to collect secondary data that were later reused (excerpts from meeting minutes and communication campaigns on railway careers, and internal documents on the future of professions) and strengthened the researcher's legitimacy in the stations and with local teams.

Data analysis

Data analysis consisted of specifying how the scapegoating process unfolded over time according to two of Langley's (1999) processual perspectives. These proved to be particularly relevant for understanding the logic that structured the temporal phenomena (Van de Ven, 1992) and drawing out the richness, dynamism, and complexity of the data (Langley, 1999). Of the 600 pages of transcription, only the data shedding light on scapegoating were coded, which amounted to one-third of the material originally collected, that is, 200 pages of transcribed interviews and secondary data.

Two steps of analysis were necessary. In the first step, we looked for breaks in the linearity of the conventionally described scapegoating process. Known as temporal bracketing, this strategy of processual data analysis (Langley, 1999) identified the stages in the process and their content. Five time-ordered stages emerged for each scapegoat case. The breaks in linearity appeared in the fourth stage and resulted from the interactions of the scapegoats' and management actions in response to the collective persecution. Double

coding provided a systematic reformulation of the divergent interpretations until consensus was reached on the identification of each stage. Table A in the Appendix illustrates the contents of the stages.

In the second step, we constructed a detailed chronological account of each case. This 'narrative strategy' (Langley, 1999) made it possible to format the raw material (primary and secondary data) by reordering it in the form of vignettes. The vignettes, essentially narratives written by the researchers, were certainly subjective and retrospective versions of the scapegoating situations, but they were similar enough to the actual sequence of events to be considered representative and emblematic (Miles, Huberman, & Saldana, 2013). Although the facts as reported by the interviewees converged, the interpretations of the protagonists (scapegoat, persecutor, and witness) often diverged. For example, the persecutors justified excluding the victim by claiming that he or she was responsible for the perceived job-related and cultural crisis, and they tended to minimize the acts of violence. When this violence was corroborated by several interviewees, we considered it plausible and to be explored.

The data interpretation and all the coding steps were carried out by the two authors. The data analysis was modified (identification of the stages in chronological order, underlying mechanisms, and various outcomes) as the authors gained an in-depth understanding of the phenomenon. An extract from the data coding is presented in Table A of the Appendix.

Results

The results are presented in two parts: the first describes the stages of the scapegoating process, and the second part highlights the protagonists' actions and the four typical outcomes.

The five stages of scapegoating

The comparison of scapegoating situations showed similarities in the first three stages of the process and differences in the fourth and fifth stages.

Stages 1, 2, and 3: Emergence of the crisis, selection, and sacrifice of the scapegoat

All the situations began with a change that the collective perceived as threatening. This change had profoundly transformed the collective's job description and culture, causing a wave of uncertainties and worries. The uncertainties concerned the quality of work, the commitment to the company and the collective, attitudes, behaviors, and language, all of which were perceived as being legitimate or illegitimate.

Those who came to be considered the symbols of change were indeed the personification of threat and its causes, even though all this remained obscure or inaccessible to the collective. The scapegoats' attributes resonated with the collective fears. Certain individuals became scapegoats because of an intrinsic stigma: this was the case for women drivers who joined a team of mostly men highly resistant to the feminization of their profession (case E). Other scapegoats were chosen for an extrinsic stigma. These included the new generation of local managers who had graduated from business schools and behaved in ways that reflected a managerial culture closer to that of the private sector, in clear contrast with the vision that the employees had of their management and company (cases A, B, C, and D). Young newcomers to teams of 'old-timers' were also stigmatized because of their 'zealous' attitude about the prescribed work rules and management (cases F and G).

Once scapegoats were selected, the collectives proceeded to violently attack them. They taunted them, hindered them in their work, disqualified, provoked or ignored them, verbally assaulted them, spread rumors, and socially and physically excluded them. At this stage, the scapegoats were designated, persecuted, and held apart by their respective collectives in each of the situations.

Stage 4: Reactions to the sacrifice – The actions of the scapegoat and management

At this stage, the actions of the scapegoat and management differentiated the outcomes.

The scapegoats displayed two defensive actions as they faced adversity. Some chose to flee, while others fought back. Flight often manifested as avoiding the collective on a daily basis. The scapegoat thus self-excluded from the group while remaining part of it (cases E and F). At its most extreme, flight could cause the scapegoat to leave the collective, thus ending the persecution (cases A and B). Fighting back was an attempt to address the situation. It could be directed against the persecution or the stigma. When it was directed against the persecution, the scapegoat denounced what was happening and tried to gain the support of management (case G). When it was against the stigma, the scapegoat worked to conform to the codes and informal rules of the persecuting group (cases C and D).

Management ($N + 1$ of the scapegoat and persecuting collective or higher levels) generally took one of three types of action. It could support the scapegoat against the persecuting collective by clearly expressing dissatisfaction and seeking sanctions against the collective members (case G). It could also support the persecuting group against the scapegoat in three ways: by explicitly incriminating the scapegoat (cases B and E), ignoring the scapegoat (case A), or

attributing to him/her at least some of responsibility for the situation (case F). Finally, management could take intermediate action by partially supporting the scapegoat psychologically yet without explicitly opposing the persecuting group (cases C and D).

Stage 5: New social order – The reconfiguration of the collective

Following the actions of the scapegoat and management in response to the scapegoating, the collectives reacted in three ways. They could commit as a whole and for the long term to continuing the persecution (cases A, B, E, and F), but some (case G) or most of the collective members (cases C and D) could also choose to end the persecution.

It thus appeared that the persecuting collectives reacted to the actions of the scapegoat and management, who acted as either obstacles or invitations to continue the persecution. It should be noted that when the scapegoat was submissive about being persecuted (flight) and management gave approval (support of the collective's action), the collective tended to pursue its course (cases A, B, E, and F). The scapegoating process was strengthened, and the outcome was the victim's isolation (cases E and F) or expulsion (cases A and B). In cases of isolation, all the protagonists participated deliberately or by default in persecuting the scapegoat, including the scapegoat who self-excluded. The situation was similar in cases of expulsion, except when the scapegoat seized (or was forced to seize) an opportunity to escape by transferring out. The collective was then deprived of an accessible victim. As the threats and worries were ever present, it then became possible that another ideal victim would emerge.

Conversely, when the scapegoat fought back (fight) and management opposed the sacrifice even partially (full support/ambivalent support for the scapegoat), the collective's persecution was at least somewhat weakened (cases C, D, and G), which had one of two remarkable results: the collective split into two coexisting camps (case G) or the scapegoat was brought back into the fold by most of the members (cases C and D). In the case of cohabitation, the scapegoat was first supported by management and then by newcomers carrying the same stigma, and these proved to be precious allies. The collective then split into two opposing camps. The original group of former persecutors continued to resist change, and the new group of scapegoats was certainly rejected by the first group but they were nevertheless integrated and could accept and apply the changes in their work. In the case of assimilation, the scapegoat's fight against the stigma and the partial support of management ultimately led to the scapegoat being accepted back into the collective. The scapegoat thus managed to stop the persecution, and the persecutors felt that they had symbolically fended off the threatened change by removing indirectly the stigma.

These two opposite modes of resolution stood out in the scapegoating process: the first catalyzed and strengthened the phenomenon (isolation and expulsion), whereas the second channeled and hindered it (cohabitation and assimilation). The following section details these dynamics by illustrating them through the stories of Marianne, Sacha, Michael, and Lucie, each having experienced a different outcome.

Four scapegoats and their actions

We present four vignettes that provide condensed descriptions of the four typical outcomes of scapegoating that emerged from our data. Cases B, D, E, and G were selected because they illustrate the diversity of the changes and types of scapegoats. In vignette 1, Marianne's outcome was isolation. Vignette 2 presents the story of Sacha, who was ultimately expelled from the collective. Michael was finally reintegrated into the collective, as recounted in vignette 3, and vignette 4 presents the story of Lucie, whose outcome resulted in the cohabitation of two collectives.

Vignette 1: Marianne's isolation (case E)

Eighty percent of the employees of FERR are men, and no 'agent' of any type has been a woman. The culture of professional drivers was always strong, with masculine norms that have been profoundly challenged by the recent feminization of its workforce. The profession itself is being transformed, as physical strength is no longer a perquisite, and work can now be interrupted for parental obligations and family life (e.g., part-time work and parental leave). "The arrival of women has upset this cultural norm" (excerpt from a meeting, background and diversity). At driving school, Marianne's instructor did not fail to tell her that "we don't take women at this school, only normal people. Definition of normal people: men without children." (O4a). However, like the drivers who would welcome her in rooms filled with posters of naked women (key informant), she was not prepared for the difficulties of this encounter. She had to endure sexist humor and provocations from these men, who seemed to have found in her an ideal victim. When she was refused a monitor of her work for fear that she would "wow him," she had to "strongly insist" that her superiors and peers give her the same training that her male colleagues had been given. She was dismissed as a professional by rumors that she had done well on her exams by giving sexual favors. "Being a better driver than a man is not normal, so I had to suck it all up in order to get the grade," she said. Marianne was constantly reminded of the stigma of being a woman: "I can't talk to them about

work because we always come back to the fact that I'm a woman." This persecution was not, however, part of the traditional rite of passage, as she explained "in this job, they call the newcomers 'asshole students' and they have to prove themselves with the worst trains and crazy working hours for about two years before they're accepted. But fifteen years later, I still have to prove myself, I'm always proving that I can do the job." Her male and female colleagues, like the union representatives, were rather insensitive to the issue of feminization, having chosen their side and now preferring to close their eyes. Management, particularly her last manager, whom she describes as "clearly misogynistic," added to the incessant fault-finding with degrading remarks. "He [the frontline manager] said to me: a woman shouldn't drive trains, she can't raise her children properly if she's a driver, and my wife is at home to raise my kids; you're one of the most worthless drivers in France." She became increasingly rejected, but it was difficult to leave this position for another. She would have liked to be an instructor, but her part-time job closed many possibilities for a transfer. She isolated herself in her cabin, which modestly protected her from her colleagues' remarks, because she can no longer stand the driving agents […]. "Being alone in the cabin limits the impact of their remarks." She no longer frequents the break rooms and when mandatory training days put her in contact with her colleagues, she stoically "takes [their remarks] on the chin." Ultimately, she complies with her role as scapegoat by participating in her isolation. The change was thus circumscribed and held at a distance, and life in the collective was able to resume its normal course.

Table 4 provides a summary of cases E and F, which illustrate the isolation of a scapegoat. This isolation consisted in avoiding the collective and thus becoming isolated. Case F, not described here, concerns a newcomer, bringing a new way of conceiving the job and dealing with management and union commitment, to a group of old-timers attached to the 'traditional' operating modes.

Vignette 2: Sacha's expulsion (case B)

The creation of computerized switching stations (CSS) caused considerable reluctance among the switching agents. They were forced to leave their stations to go to the CSS and feared being professionally downgraded: "they no longer hesitate about putting someone on the sidelines and letting them sink. I saw it when the CSS was being put into place. There was the best agent in the station, a genius. I'm not going to say that he was left to die but not far from it. He almost ended up a psychiatric case. He was 52years old. He didn't want to work from the screens, and he needed to really see for himself. So instead of trying to change his mind, they put him… When there's work on the tracks, there's a guy with a horn who lets us know a train is coming. They're often disabled or drunks. He was put there to make sure he understood." (O1a). This was the context when Sacha arrived. He was appointed head of one of the first CSSs in the territory, made up of a collective of old-timers sent from the stations they had been forced to leave. A graduate of a very good engineering school but without railway experience, he quickly came to embody FERR's NPM in the eyes of the others. To his agents, Sacha was a strategist, an opportunist, interested neither in the switching profession nor in the team he managed. "That engineering school, they all leave with that kind of blind ambition. They know how to sell themselves. They know how to position themselves. But they don't give a damn about the human factor. […] He doesn't know anything [about the jobs in the sector]," (O1a) claims one of his agents. In line with the stigma he carried, his behavior called into question issues of autonomy, room for maneuver, social rituals, and the local arrangements of signalers in favor of control and the individualization of work: "[e]verything's controlled, recorded, the slightest click, the slightest touch on the keyboard. No more freedom! […] Now everyone sits in front of the twelve screens" (O1a). The collective as a whole began to engage in openly hostile behavior toward the person now described as 'Big Brother.' "It was building up for one day, two days and on the third, it all fell apart [the manager was insulted and

Table 4. The isolation of the scapegoat (cases E and F)

	Crisis emerges	Scapegoat chosen	Scapegoat sacrificed	Actions of protagonists	New social order
Case E	Feminization of driving jobs: questioning a masculine culture, the need for physical strength in the job, the legitimacy of sexist humor	A very feminine driver who does not conform to the masculine culture	Derogatory remarks, provocation, professional disqualification, social isolation	Continued persecution by the collective Management gives support to the collective Scapegoat avoids the collective	Isolation of the scapegoat
Case F	Rejuvenation of the work collective: questioning the rites and practices of the 'old-timers', such as local arrangements, union commitment, defiance of management and criteria for *work well done* according to new standards of safety and productivity	A young newcomer who doesn't fit with the rites and practices of the old-timers	Taunts, social isolation, professional disqualification		

threatened]. His face was all red with tears running down it" (O1a). A union representative brought this situation to the attention of senior management, who, fearing a work stop by this highly unionized collective with considerable power to disrupt the workflow, took the side of the persecutors. One of them contacted Sacha directly and asked him to change his behavior to avoid an explosion. "He [the senior manager of FERR] called him [D1]. He told him he had to change immediately because it was going to be a disaster" (O1a). When the management rallied to the side of the persecuting collective, Sacha experienced it as the blow of a 'sledgehammer'. He took the opportunity to leave as soon as a possibility for transfer came up. The social climate was again peaceful, Sacha's management superiors were protected, and the collective was able, at least for a while longer, to put off the professional and cultural changes that Sacha had represented, now 'neutralized'.

Table 5 summarizes cases A and B, which illustrate the expulsion of a scapegoat. Case A, not presented here, describes a manager, a 'former agent', who, having risen to a 'managerial' position, adopted the codes of managerialization, thus calling into question the collective's 'traditional' modes of operation. Seeing in him a 'traitor', the collective began to persecute him.

Vignette 3: Michael's assimilation (case D)

NPM and the spread of a managerial culture at FERR were partly supported by the arrival of managers from the private sector. The recruitment of managers with no railway experience completely opposed the traditional career path and was strongly criticized: "[…] These young graduates have really upended the management that was in place" (human resources manager; key informant). Michael indeed presented a clear contrast with the usual figure of someone starting at the bottom and working their way up, step by step. Young, with no field experience and recruited directly from a private company, he was placed in charge of a highly unionized team of experienced agents. These 'old pros' took a dim view of Michael's arrival. As he tried to transform the profession – by instituting more stringent safety rules and more control systems, all the while reducing the workforce – and challenged the local collectivist culture – by individualizing the work and limiting solidarity and collective time – he quickly came to be perceived as a threat. "There's not the same friendly feeling as before. That's because of how we're being managed […] They took it all apart. So that we'd no longer be united, with less in common, for strikes, etc." "After a while, the manager became a judge and 'cop' […] It's becoming like the private sector" (O3a), said an agent regretfully. Michael was stigmatized for his managerial language, which did not fit well with railway jargon. His language reflected his ignorance of the profession and therefore his lack of legitimacy for his position. In retrospect, Michael said: "[t]hey had a bad idea about me. Also, I came from the private sector. I had a way of speaking that didn't fit at all [with the job]" (M3a). Disliked, he was successively denigrated, reviled, and ignored. Insulted as a 'jerk' and a 'good for nothing', his agents deliberately broke the safety rules in front of him, signaling both their disrespect for him and their disagreement with the transformations. When Michael asked one of his persecutors why he had defaced the paper that he had just asked him to sign, his answer reflected the image that Michael despite himself gave the team: "[i]t's no big deal. It's physical. I just don't like you." Despite the opportunities for transfer available to him as a manager and the discreet support of management, which refused to sanction the persecutors for fear of causing a collective work stoppage – "The director of the operational unit is there, but it's blocked from above, by the unions" (M3a) – Michael refused to accept the situation. With the support of his peers, he tried to understand his persecutors' viewpoint and began to work on himself. He fought against his stigma by learning the ways of the railway profession and thus gradually conformed to the codes and rules of the persecuting group. His efforts were not in vain as he managed to halt the scapegoating process and earned the respect of most of his agents, who finally accepted him. "I think that's why they respect me more than before. […] They see that I am not a puppet, that when I speak about safety, I really know what I'm talking about. Even though I don't have the experience they have, they know

Table 5. The expulsion of the scapegoat (cases A and B)

	Crisis emerges	Scapegoat chosen	Scapegoat sacrificed	Actions of protagonists	New social order
Case A	Managerialization: questioning the social rites of the old-timers, individualized work, increased control and traceability.	A manager who had adopted the codes of managerialization	Taunts, short-circuiting, professional disqualification	Collective continues the persecution Management gives support to the collective Scapegoat leaves	Expulsion of the scapegoat
Case B		A young manager from an excellent school with no railway experience ends up in PAI with little knowledge of the railway culture	Derogatory remarks, insults, threats		

very well that I know the regulations." "[Before] the guys were making safety mistakes in front of me. Today when I show up, even though I know very well that behind my back they might get hurt, they make the effort to do things the right way in front of me." By shaking off part of the change he embodied, Michael was able to ultimately negotiate his way into the collective, and the collective was able to hold off the arrival of a managerial culture that it did not want to see established.

Table 6 provides a summary of cases C and D, which both illustrating the assimilation of a scapegoat. Case C, not explained here, concerns a manager, a former agent, who would have liked to adopt the codes of managerialization to supervise a group of old-timers. Like case D, he ended up fighting against his stigma to be accepted by the collective.

Vignette 4: The cohabitation of Lucie and her persecutors (case G)

Lucie is part of 'the younger generation'. After working in the private sector, she was trained in the company's new work procedures and sensitized to issues of productivity and efficiency, which were the central arguments for the transformation in the official discourse. She embodied management's vision for the company but was rejected by the group of older agents she had joined as a departure agent. Upon arriving, Lucie criticized the deviance of certain entrenched social rites, like using outdated procedures, crossing the tracks and drinking alcohol when managers were not around. "On Wednesday, there were two who could barely stand. The newcomers thought this wasn't normal and they were right. They were shocked. When they came back down, you could smell it. The guy was still leaning against a post" (M5). In addition, she refused to join a union or go out on strike and generally took the side of her manager, unlike her colleagues. Very quickly, she embodied for this crew a challenge to long-established ways of working, the disintegration of collective solidarity around social struggles, and a willingness to reexamine the systematic opposition to management. "It's like *everything from management is bad*. The slightest gesture, the smallest gift certificate, is an insult. It's a bit excessive and I blame the unions for that. They threaten first, they argue, they strike, before any discussion" (O5a). As one informant pointed out, the agents were threatened by the arrival of this generation because "what they've learned all their lives has become obsolete. Young people see opportunities" (Local manager; key informant). Yet management appreciated Lucie's behavior. "They [young people] have a different way of looking at work. They really come here to work. When they have to work hard, they do. They apply the regulations. They don't argue" (M5). Lucie's stigma became readily apparent because "the new people, as soon as they arrive and have their grade, they're labeled" (O5a). She did not understand what she was being blamed for and suffered from the hostilities of her colleagues, who laughed at her, disparaged her, and humiliated her in public. "I was literally told off in public. […] I tried to figure out what I had done wrong to be yelled at like that if the mistake wasn't mine" (O5a). Deeply affected, Lucie could not afford to leave her post and continued to suffer. She then sought help from her manager by writing a letter to inform him of her persecution. He said: "When I found out, I called her. She was crying" (M5). Sensitive to Lucie's psychosocial distress, he tried to protect her. "[I tell them] that if they are having a hard time, they shouldn't hesitate to talk to me about it, that no one should impose anything on them" (M5). Lucie was motivated by this support. Some time later, new agents with the same stigma joined her crew and her cause: "three people arrived after me, and I get along with them very well […] They sort of have the same motivation. We want to represent our company, do things well, be above reproach" (O5a). Two sub-crews were thus formed: one being Lucie's persecutors, whom she remained wary of, and the other being the young people, whom she was now part of. Change was therefore partly integrated into this collective, with persecutors and scapegoats having equal strength and no other choice but to live together.

Table 7 summarizes case G, which illustrates the coexistence of the scapegoat.

In conclusion, the vignettes presented indicate that the outcomes of scapegoating depend on the articulation of the

Table 6. The assimilation of the scapegoat (cases C and D)

	Crisis emerges	Scapegoat chosen	Scapegoat sacrificed	Actions of protagonists	New social order
Case C Case D	Managerialization: questioning the social rites of the old-timers, individualized work, increased control and traceability.	A manager who had adopted the codes of managerialization A young manager from the private sector with no railway experience and little knowledge of the railway culture	Derogatory remarks, provocation, professional disqualification, social isolation	Collective persecutes, then most members assimilate the scapegoat Management gives ambivalent support to the collective Scapegoat fights the stigma	Assimilation of the scapegoat

Table 7. Cohabitation of the scapegoat (case G)

	Crisis emerges	Scapegoat chosen	Scapegoat sacrificed	Actions of protagonists	New social order
Case G	Rejuvenation of the job collective: questioning the rites and practices of the old-timers, such as local arrangements, union commitment, defiance of management, and criteria of work well done according to new standards for safety and productivity.	A young newcomer who does not conform to the rites and practices of the old-timers	Insults, social isolation, taunts	Collective persecutes and then reintegrates the scapegoat Management gives support to the scapegoat Scapegoat fights the persecution	Cohabitation of two collectives

Table 8. The four outcomes of scapegoating, their modes of regulation, and the underlying actions

	Mode of regulation	Catalyzes the scapegoating		Channels the scapegoating	
	Outcome of the process	Isolation of the scapegoat	Expulsion of the scapegoat	Cohabitation of two collectives	Assimilation of the scapegoat
Actions of the protagonists	Actions of the scapegoat	Avoidance	Departure	Fight against persecution	Fight against stigma
	Actions of management	Support of collective	Support of collective	Support of scapegoat	Ambivalent support
	Actions of the collective	Sustained persecution	Sustained persecution	Persecution then assimilation by a part of the collective	Persecution then assimilation by most of the collective
Cases/Scapegoat (Table 3)		*Case F/O5b** *Case E/O4A*	*Case A/M1* *Case B/D1**	*Case G/O5a*	*Case C/M2* *Case D/M3a*

protagonists' actions. Two modes of regulation were identified: the first mode catalyzed the persecution and led to the isolation or expulsion of the scapegoat, whereas the second mode channeled it and led to cohabitation or assimilation.

The mode of regulation that catalyzed the scapegoating resulted in the collective's ongoing persecution, management's support of the collective, and the scapegoat's avoidance or departure. Depending on the case, the protagonists' actions appeared in different orders. In case F, for example, management's support of the collective inevitably led to the scapegoat's intention to leave because his persecution was strengthened. Conversely, in case E, it was difficult to distinguish the succession of actions over time. The ongoing persecution of the scapegoat seemed to result from both management's support of the collective and the scapegoat's withdrawal.

The mode of regulation that channeled the scapegoating systematically appeared at the scapegoat's initiative, with fighting back either against the stigma or against the persecution. In case G, informing management of the persecution generated support. Management, wanting to change the collective's practices, decided to renew the workforce by bringing in non-persecuting individuals. In case D, the scapegoat's fight against his stigma helped put an end to the persecution, despite management's discreet and ambivalent support.

Table 8 presents these outcomes, the underlying actions. and the two modes of regulation that emerged.

Discussion and research agenda

In this section, we discuss the contributions of this research and the new perspectives that this exploratory study opens to better understand scapegoating and how it is regulated.

Emerging contexts and types of scapegoat

Our results suggest the interest of a more situated reading of scapegoating in organizations as opposed to earlier works, which have generally worked within a framework of categories to describe the various characteristics without exploring the contexts in which they emerge. We thus offer three lines of research to explore in detail both the contexts of emergence and the types of scapegoat.

Organizational contexts that produce scapegoats

First, our results support the idea that periods of crisis tend to generate scapegoats (Boecker, 1992; Bonazzi, 1983; Casanova, 2014b; Daudigeos et al., 2014; Girard, 1982). This study explored the research avenue suggested by Desmond and Kavanagh (2003) and focused on contexts of organizational change. Our findings agree with those of other researchers and show that change, when it upends the rules of a profession, the culture of a collective (Uhalde, 2005), and the collectively shared organizational myths (Danniau & Meynckens-Fourez, 2015), can lead to the exclusion of those who are perceived as no longer adhering to 'the way things have always been' or as willing to embrace change – and thus whose place is not firmly fixed. It therefore seems that in times of change, scapegoating is a way of resolving a conflict that management has not addressed (Daudigeos et al., 2014). However, our scapegoating situations not only revealed the general process of scapegoating but also showed that the situations were embedded in specific interpersonal, professional, organizational, and transformational contexts.

Change obviously can provide a fertile ground for scapegoating, but little is known about the actual conditions for its emergence. Although the literature indicates that situations of uncertainty and worry produce it (Girard, 1982; Uhalde, 2005), it seems surprising that of the 13 collectives in our data set undergoing organizational change, only five produced scapegoats, and two of them doing so twice. We therefore extended our initial analysis and performed a more in-depth study of some of the contexts that seem to trigger scapegoating (e.g., corporate restructuring, mergers and acquisitions, technological change, modification of power relations, etc.) to determine which conditions favor it and which do not.

We did not exclude the possibility that other contexts that generate uncertainty and concern may also favor its emergence and we therefore intend to focus on this question more fully in the future.

Scapegoats who reflect the organizational contexts of their emergence

Second, in this study, we were able to associate specific contexts of change with specific types of scapegoat. Those that we identified fit into categories described in the literature (Boecker, 1992; Bonazzi, 1983; Gemmill, 1989; Lhuilier, 2002; Uhalde, 2005). But more importantly, it appeared that stigmatization was a social product of the interactions between the target and the collective in a given context (Goffman, 1975 [1963]). Thus, the results suggest that the scapegoats only become so because their features associated them with perceived threats. Those we identified were newcomers, still poorly integrated and carrying stigmas that were intrinsic (linked to the scapegoat's features) or extrinsic (linked to the scapegoat's behavior). Specifically, all were women arriving in collectives with a very masculine culture, young recruits joining 'old-timer' work crews, or NPM-oriented managers who found themselves in collectives deeply attached to the traditional notion of public service.

It should be noted that these individuals embodied issues that are well known to organizations, that have indeed prompted their own fields of research, and that would undoubtedly benefit from an analysis of how they develop over time. For example, the feminization of predominantly male professions is now more frequently seen (e.g., engineering, firefighting, and policework) (Malochet, 2007) and, as Pruvost (2008) noted, the nondifferentiation of gender in a virile culture emerges from earlier stages of the defeminization and virilization of women. When physical and mental strength are elevated to the rank of professional skills, more fragile women are disqualified, especially when they refuse the virilization imposed on them. Likewise, organizational change and the introduction of NPM norms may prompt intergenerational conflict in the workplace (Huyez-Levrat, 2007). Certain studies have associated transformations of the NPM type with the phenomena of harassment (Abord de Chatillon & Desmarais, 2012), which can be read somewhat differently in our framework. Our results do not contribute to the categorical approach to workplace conflict, harassment, and discrimination, but instead provide a lens for gaining original insights and encouraging new organizational actions. These situations can thus be examined from the angle of the crisis they reflect and the roles played by the protagonists – collective, victim, and management.

Moreover, the investigation of situations of change in which the scapegoats are those who refuse the change, as opposed to the rest of the collective, might be worth examining.

Indirect access for the study of scapegoats in the organization

Third, the difficulty of studying scapegoating, which is at least partly denied by most protagonists (Girard, 1982), undoubtedly explains the relative paucity of research, notably in the organizational sciences (Desmond & Kavanagh, 2003). Adequate methodologies are thus needed. In our case, it seems that our indirect approach to the phenomenon facilitated its study. In addition, although our results could not be systematically evaluated by all the protagonists, this limitation was partly circumvented by the interpretations of the various protagonists that were then reinforced in informal conversations. However, this exploratory study remained limited by its methods.

The suitable methods will have to take into account the tendency to deny that scapegoating is happening and it is highly sensitive, collective, dynamic and processual in nature. The methodological designs might differ, depending on whether the aim is to study the contexts for the emergence of scapegoating or its modes of regulation. In the contexts identified in this research (e.g., feminization of traditionally masculine jobs, etc.), support might be given to companies in their efforts of preventive management, which in turn might deepen our understanding of the determinant factors. Action research to help organizations manage crisis situations would be an opportunity for researchers to collect rich data while occupying a legitimate (not clandestine) position. Different modes of scapegoating regulation would thus be experienced at close range, with the possibility of post-intervention monitoring to assess the evolution of the process in the medium term and its outcome.

Actions and interactions of the scapegoating protagonists

This study brings nuance to the generally deterministic reading of the reactions of scapegoating protagonists (e.g., Eagle & Newton, 1981; Gemmill, 1989) through a fine-grained analysis of the actions and interactions of scapegoats and their entourage. To build a typology of the determinants of scapegoating and protagonists' actions, we propose two avenues of research.

Multiple actions on the part of the protagonists

First, according to our results, scapegoats are not always passive about their fate. Just like victims of stress (Lazarus & Folkman, 1984), violence (Zapf & Gross, 2001), ostracism (Grima & Muller, 2006), or discontent (Hirschman, 2011[1970]), their actions show a complex articulation of fight and flight tendencies. Although some scapegoats may confirm their exclusion by avoiding their persecutors, as the literature predicts (Eagle & Newton, 1981; Gemmill, 1989), others fight back (leaving, fighting the stigma, and fighting the persecution). As is the case for victims of violence in general, it is the least intimidated scapegoats who try to confront their attackers, request management intervention, and consider fleeing behaviors only once all other options have failed (Dehue et al., 2012; Hogh & Dofradottir, 2001; Zapf & Gross, 2001).

These same findings also bring greater nuance to the assumption that management generally takes the side of the persecutors (Bonazzi, 1980; Casanova, 2014b; Girard, 1982; Leymann, 1996) and remains passive in the face of the violence in progress (Di Martino, Hoel, & Cooper, 2003; Leymann, 1996). In accordance with the observations of Boecker (1992) and Bonazzi (1983), management may effectively incriminate scapegoats who are perceived to serve as 'safety valves', even among firstline managers. In this case, in line with Girard (1982) and like Casanova (2014b), we noted that defending the accused meant running the risk of also becoming a scapegoat. Nevertheless, our results also showed that some managers were willing to offer their support to the scapegoats. This specific situation recalls Karpman's (1968) 'infernal triangle' and the relationship involving a victim, a persecutor, and a rescuer – the last being management in our case. This exploratory study certainly did not cover all the actions deployed by scapegoats and management in such contexts, and one of the study limitations is undoubtedly our assumption that the protagonists' reactions were uniform, when it is likely that nuances and evolutions might have been observed.

Given these observations and the limitations of this study, broader and more in-depth studies of the actions of scapegoating protagonists are needed. The literature on coping with stress (Lazarus & Folkman, 1984) might provide a solid reading frame for identifying and categorizing the actions of scapegoats according to whether they are oriented toward managing the situation (actions centered on the problem) or toward the emotions it produces (actions centered on the emotions). It might also be important to focus of how management addresses scapegoating, particularly by drawing on the studies on social support (Greenglass, 1993). Doing so would not only reveal the range of managerial support behaviors but would also distinguish their modes according to professional support typologies; this point is important as our study focused only on the support perceived by its targets. Managerial support could thus be broken down according to its emotional (listening, attention, friendship, etc.) or instrumental (Fenlason & Beehr, 1994) modality, the latter being tangible (direct actions) or informational (advice and information) (Lazarus & Folkman, 1984).

The diversity of attitudes of scapegoating protagonists – here assumed to form a homogeneous whole – would thereby be highlighted. The actions of sets of actors need to be more fully described, particularly regarding each actor's weight in the collective and the dynamics specific to each collective. For example, light could be shed on the roles of informal leaders, official referents (particularly union representatives) and all those with legitimacy, and an audience in the regulation of scapegoating.

Furthermore, the dynamics of the interactions among the scapegoating protagonists may be a promising line of research. The actions of one protagonist are responses to those of the others in an ongoing chain, and we identified two modes of regulation: dynamics that catalyze and those that channel. These interactions could be more systematically investigated, with a focus on detailing the combinations of actions and their order of succession that ultimately lead to one of the multiple outcomes.

The determinants of the scapegoating protagonists' actions

In agreement with the research on coping and exclusion, the actions of the scapegoats in our study were built according to the context (Lazarus, 1992) and the available social resources (Grima & Muller, 2006; Lhuilier, 2002). The data thus indicate that scapegoats' recourse to actions of fighting back and the effectiveness of this choice are in part due to their social resources, whereas opportunities to leave apparently potentiate departure. Similarly, it might be assumed that management supports the persecuting group when the risk of blocking change is high or contagion of the stigma is present (Daudigeos et al., 2014), whereas it supports the scapegoat when a psychosocial risk to his or her health is suspected.

Future work might shed more light on these determinants, especially the managerial choices, which have an essential weight in the favorable or unfavorable outcome of scapegoating. In the field of managerial ethics, the consequences that managerial actions can have raise the issue of managerial courage (Sekerka, Bagozzi, & Charnigo, 2009). In abnormal and potentially damaging situations, managerial courage is the exact opposite of managerial denial, which, as Leymann (1996) observed, acts as tacit permission to persecute. Managers are therefore called upon to formulate morally acceptable responses to risky situations that oppose organizational (e.g., the implementation of change) and individual (e.g., the health of the scapegoat) interests (Harbour & Kisfalvi, 2014). It is thus important to understand the origins of managerial courage, as the motivations can be personal, contextual, and/or cultural (Harbuor & Kisfalvi, 2014; Sekerka et al., 2009). More broadly, the ability to managerially regulate situations of scapegoating by channeling them could be assessed in terms of the capacities and possibilities of managers to detect and understand their employees' distress, show compassion, and respond with appropriate solutions (Pezé, 2014).

More broadly, the capacity to question the bases for persecution seems to be contingent on the context, with the effectiveness of regulating actions largely determined by the power relationships in play. For example, Hearn (1994) noted that the ideology of male domination that permeates the organizational representations of violence tends to normalize the violence. This ideological configuration is likely to favor and conceal scapegoating phenomena in the same way that a more critical ideological configuration about violence is more likely to contain and facilitate its denunciation. Taking better account of these contexts would improve our understanding of the sources for effective actions to regulate scapegoating.

Regulation of scapegoating outcomes

This study showed the diverse outcomes of scapegoating (isolation, expulsion, cohabitation, and assimilation) and how they are regulated: catalyzing and channeling. It also brought nuance to the generally accepted notions of an unambiguous scapegoating process and the passive scapegoat irrevocably sacrificed by his or her persecutors (Girard, 1982). Future work should therefore focus on building typologies of the actions and management of the scapegoating outcomes.

Typical outcomes of scapegoating

In line with the literature, our results show that scapegoating can lead to the victim's expulsion (e.g., Eagle & Newton, 1981; Gemmill, 1989; Girard, 1982). Yet they also show that scapegoats are able to leave the victim configuration. Depending on how the protagonists' actions are articulated, persecution can be continued, weakened, or interrupted. The process is not uniform, and we identified four outcomes. It was strengthened by isolation and expulsion, whereas assimilation and cohabitation hindered the process. These regulated outcomes of scapegoating echo the works of Wu et al. (2012), who noted that some of the excluded manage to be accepted into an alternative collective or even their initial collective, and Charreire-Petit and Cusin (2013), who described the journey of a resilient whistleblower.

We observed that the collective can indeed engage almost unanimously and persistently in the persecution and exclusion of a scapegoat, but also that the behavior of this victim and management are equally capable of stemming the violence and bringing about the victim's partial or complete reintegration. When the persecution is denounced by the scapegoat and/or disapproved by management, the justification for the violence might begin to be questioned. This indicates that the persecutors are able to reexamine their stigmatization (Cusin & Maymo, 2016) and that the effects of domination, which naturalize symbolic violence (Bourdieu & Passeron, 1970), can be delegitimized by its actors. Although we agree with Lutgen-Sandvik (2006) that collective actions to combat violence are the most effective, our results point to the determining role of management and its support of the victim in weakening the process.

Last, while the phenomena of harassment are often read as interindividual dynamics between the harassers and the harassed (Hirigoyen, 1998; Poilpot-Rocaboy, 2000), our analysis frame takes into account the collective dynamics noted by Leymann (1996) and Sirota (2017) and the organizational determinants emphasized by Bouville and Campoy (2012). Our results reflect the process at the level

of work teams, whereas most of the previous studies have focused on a larger scale (e.g., the organization or several scapegoating organizations) (Bonazzi, 1982; Daudigeos et al., 2014).

Future studies should also seek to identify the full range of possible outcomes in order to arrive at a more complete typology. By doing so, more types of positive outcome might be discerned, and their mechanisms could be studied. This is vital to develop more effective ways of combating the actions that tend to strengthen the scapegoating process.

Developing paths for prevention and management

The destructive consequences of organizational scapegoating demand effective strategies for prevention and management, and this is especially so in our postmodern societies, where the rising uncertainty in the workplace (Castel, 2009) is matched by the massive denunciation of the violence it provokes (Mucchielli, 2008). Although it may be illusory to believe that this endemic violence can be stamped out, regulating its occurrence seems a realistic and desirable objective (Favaro, 2014). The European framework directive of 12 June 1989 made it mandatory for employers to ensure the safety and health of their employees, and since then the demand for policies to protect employees' mental health and stem workplace violence has only grown, becoming pervasive in France. Our investigation in this sense points the way toward several preventive paths: primary (limiting the risk of emergence), secondary (stemming the process in progress), and tertiary (acting retrospectively). Action research initiatives, for example, would be invaluable in confirming or disproving the effectiveness of these policies in real-life contexts. Future research might also assess the mechanisms already in place to manage collective conflicts on the job. The following paragraphs detail the managerial recommendations drawn from this research.

Our results demonstrate the interest of acting on the context for emergence. Scapegoating often emerges when the organization has no or little response to concerns and latent conflicts (Daudigeos et al., 2014); management therefore has a vital role in triggering it. Managers must resolutely work to prevent and manage crises and to avoid a recourse to scapegoating. Three levers seem potentially effective to avoid this personification of organizational problems. First, management must address the worries aroused by change (Bareil, Savoie, & Meunier, 2007) by providing adequate support. Second, it must ensure and facilitate professional mediation around work expectations, quality, and how the job is being transformed (Detchessahar, Gentil, Grevin, & Stimec, 2015). Finally, management can have an impact on the workplace culture by demonstrating the value the company places on diversity and by affirming its commitment against violence at work.

Once the process has begun, neither the isolation nor the expulsion of the scapegoat is enough to stop the process, which may well continue via a substitute, according to our findings. Management support of the victim is crucial to curb it, as are the scapegoat's social resources. It can nevertheless be difficult for managers to take a step back in this situation and choose the best course of action, and the scapegoat may be without allies. It therefore seems essential to have internal procedures in place to combat violence and to offer access to workplace consultants or psychologists and/or external care when these procedures are insufficient. This implies defining procedures for sounding the alert in the event of violent acts, collecting witness reports, mediating between the protagonists, and determining the organizational origins. Danniau and Meynckens-Fourez (2015) suggested particularly helping the protagonists to ease out of their roles by encouraging them to take time for reflection, avoiding symmetrical escalation, determining the relationships and coalitions within the collective, and giving voice to others.

Once the scapegoating has ended, it is again up to management to address the consequences. This means justly sanctioning the persecutors and repairing as best as possible the damage done to the victims. Finally, to ensure that something good can come out of this regrettable incident, it is essential to retrospectively analyze the causes, formulate the underlying problem in organizational terms, and respond in such a way that it never occurs again.

Conclusion

To conclude, this exploratory study aimed to understand how the protagonists of scapegoating participate in its regulation. We found four outcomes: the scapegoat's isolation, expulsion, assimilation, or cohabitation. The process could be strengthened or hindered by various actions of the protagonists, and the outcomes depend on how these actions are articulated. This research enriches the literatures in anthropology, psychosociology, and organizational science by showing that, far from being linear, scapegoating is regulated by its protagonists. Not least, this study raises the issue of organizational actors who knowingly ignore and even tacitly approve the violence and injustice in progress. It engages us in a hermeneutic effort to understand the intolerable (Linstead, 2013) in a situation where researchers and practitioners, like the first spectators of Fritz Lang's film (mentioned in the beginning of this article), are sometimes tempted to close their eyes. To stop scapegoating in the organization, we encourage future researche to help us to open our eyes to the phenomenon.

References

Abord de Chatillon, E. & Desmarais, C. (2012). Le nouveau management public est-il pathogène? *Management international/International Management/Gestiòn Internacional*, *16*(3), 10–24. doi: 10.7202/1011413ar

Autissier, D., Vandangeon, I. & Vas, A. (2010). *Conduite du changement: Concepts-clés: 50 ans de pratiques issues des travaux de 25 grands auteurs*. Paris: Dunod.

Ayerbe, C. & Missonier, A. (2007). Validité interne et validité externe de l'étude de cas: Principes et mise en œuvre pour un renforcement mutuel. *Finance Contrôle Stratégie*, *10*(2), 37–62.

Bareil, C., Savoie, A. & Meunier, S. (2007). Patterns of discomfort with organizational change. *Journal of Change Management*, *7*(1), 13–24. doi: 10.1080/14697010701232025

Berkowitz, L. (1962). Aggression: A social psychological analysis, New York, NY: McGraw-Hill.

Boecker, W. (1992). Power and managerial dismissal: Scapegoating at the top. *Administrative Science Quarterly*, (37), 400–421. doi: 10.2307/2393450

Bonazzi, G. (1980). Pour une sociologie du bouc émissaire dans les organisations complexes. *Sociologie du Travail*, *22*(22), 300–323. doi: 10.3406/sotra.1980.1640

Bonazzi, G. (1983). Scapegoating in complex organizations: The results of a comparative study of symbolic blame-giving in Italian and French Public Administration. *Organization Studies*, *4*(1), 1–18. doi: 10.1177/017084068300400101

Bourdieu, P. & Passeron, J. C. (1970). *La reproduction des éléments pour une théorie du système d'enseignement*. Paris: Editions de Minuit.

Bodier, M. & Wolff, L. (2018). *Les facteurs psychosociaux de risque au travail*. Paris: Editions Octares.

Bouville, G. & Campoy, E. (2012). Une approche organisationnelle du harcèlement moral. *@GRH*, (3), 53–78. doi: 10.3917/grh.123.0053

Branch, S., Ramsay, S. & Barker, M. (2013). Workplace bullying, mobbing and general harassment: A review. *International Journal of Management Reviews*, *15*(3), 280–299. doi: 10.1111/j.1468-2370.2012.00339.x

Casanova, R. (2009). Le phénomène du bouc émissaire, support de l'accompagnement institutionnel. *Contradictions*, (149). HAL Id: hal-01668749, version 1.

Casanova, R. (2014a). Observatoire du bouc-émissaire et des violences institutionnelles. Retrieved from http://bouc-émissaire.com/

Casanova, R. (2014b). Bouc émissaire. *Les Cahiers Dynamiques*, 60(2), 37–43. doi: 10.3917/lcd.060.0037

Castel, R. (2009). *La Montée des incertitudes. Travail, protections, statut de l'individu: Travail, protections, statut de l'individu*. Paris: Le Seuil.

Chabaud, D. & Germain, O. (2006). La réutilisation de données qualitatives en sciences de gestion: Un second choix? *M@n@gement*, *9*(3), 199–221. doi: 10.3917/mana.093.0199

Chappell, D. & Di Martino, V. (2000). *La violence au travail*. Genève: Bureau International du Travail.

Charreire-Petit, S. & Cusin, J. (2013). Whistleblowing et résilience: Analyse d'une trajectoire individuelle. *M@n@gement*, *16*(2), 142–175. doi: 10.3917/mana.162.0142

Cusin, J. & Maymo, V. (2016). Post-bankruptcy stigmatization of entrepreneurs and bankers' decisions to finance. *M@n@gement*, *19*(4), 305.

Danniau, S. & Meynckens-Fourez, M. (2015). Bouc émissaire dans les institutions: Pistes pour sortir de ce positionnement. *Thérapie Familiale*, *36*(4), 409–422. doi: 10.3917/tf.154.0409

Daudigeos, T., Pasquier, V. & Valiorgue, B. (2014). Bouc-émissaires, lynchages médiatiques et contestation des pratiques irresponsables des firmes multinationales. *Revue de l'Organisation Responsable*, *9*(2), 46–59. doi: 10.3917/ror.092.0046

Dehue, F., Bolman, C., Völlink, T. & Pouwelse, M. (2012). Coping with bullying at work and health related problems. *International Journal of Stress Management*, *19*(3), 175. doi: 10.1037/a0028969

Desmond, J. & Kavanagh, D. (2003). Organization as containment of acquisitive mimetic rivalry: The contribution of René Girard. *Culture & Organization*, *9*(4), 239–251. doi: 10.1080/1475955042000195427

Detchessahar, M., Gentil, S., Grevin, A. & Stimec, A. (2015). Quels modes d'intervention pour soutenir la discussion sur le travail dans les organisations: Réflexions méthodologiques à partir de l'intervention dans une clinique. *@GRH*, *16*(3), 63–89. doi: 10.3917/grh.153.0063

Di Martino, V., Hoel, H. & Cooper, C. L. (2003). *Prévention du harcèlement et de la violence sur le lieu de travail*. Office des Publications Officielles des Communautés Européennes.

Dollard, J., Miller, N. E., Doob, L. W., Mowrer, O. H. et al. (1939). *Frustration and aggression*, Boston, MA: Yale University Press. doi: 10.1037/10022-000

Douglas, T. (1995). *Scapegoats: Transferring blame*. London: Routledge.

Dumez, H. (2012). Qu'est-ce que l'abduction, et en quoi peut-elle avoir un rapport avec la recherche qualitative? *Le Libellio d'Aegis*, *8*(3), 3–9.

Dumez, H. (2013). Qu'est-ce que la recherche qualitative? Problèmes épistémologiques, méthodologiques et de théorisation. *Annales des Mines – Gérer et comprendre*, *112*(2), 29–42. doi: 10.3917/geco.112.0029

Eagle, J. & Newton, P. M. (1981). Scapegoating in small groups: An organizational approach. *Human Relations*, *34*(4), 283–301. doi: 10.1177/001872678103400403

Favaro, M. (2014). Mécanismes organisationnels de formation des violences au travail. Proposition d'un modèle-cadre pour comprendre et intervenir. *Notes scientifiques et techniques de l'INRS*, NS 320.

Fenlason, K. J. & Beehr, T. A. (1994). Social support and occupational stress: Effects of talking to others. *Journal of Organizational Behavior*, *15*(2), 157–175. doi: 10.1002/job.4030150205

Frazer, S. J. G. (1981). *Le rameau d'or*. Paris: Robert Laffont.

Gemmill, G. (1989). The dynamics of scapegoating in small groups. *Small Group Research*, *20*(4), 406–418. doi: 10.1177/104649648902000402

Girard, R. (1972). *La violence et le sacré*. Paris: Grasset.

Girard, R. (1977). *Mensonge romantique et vérité romanesque*. Paris: Grasset.

Girard, R. (1982). *Le bouc émissaire*. Paris: Grasset.

Goffman, E. (1975)[1963]. *Stigmate: Les usages sociaux des handicaps*. Paris: Les Editions de Minuit.

Gollac, M. & Bodier, M. (2011). *Mesurer les facteurs psychosociaux de risque au travail pour les maîtriser* (Rapport au collège d'expertise sur le suivi des risques psychosociaux au travail, faisant suite à la demande du ministre du Travail, de l'Emploi et de la Santé, avril 2011). Retrieved from https://www.vie-publique.fr/sites/default/files/rapport/pdf/114000201.pdf

Greenglass, E. R. (1993). The contribution of social support to coping strategies. *Applied Psychology*, *42*(4), 323–340. doi: 10.1111/j.1464-0597.1993.tb00748.x

Grima, F. & Muller, R. (2006). Faire face à la violence au travail: Le cas de la placardisation. *Gérer et Comprendre*, *85*, 37–48.

Hearn, J. (1994). The organization(s) of violence: Men, gender relations, organizations, and violences. *Human Relations*, *47*(6), 731–754. doi: 10.1177/001872679404700608

Heaton, J. (2004). *Reworking qualitative data*. London: Sage.

Harbour, M. & Kisfalvi, V. (2014). In the eye of the beholder: An exploration of managerial courage. *Journal of Business Ethics*, *119*(4), 493–515. doi: 10.1007/s10551-013-1835-7

Hirigoyen, M. F. (1998). *Le harcèlement moral: La violence perverse au quotidien*. Paris: La Découverte.

Hirschman, A. O. (2011/1970). *Exit, voice, loyalty: Défection et prise de parole*. Bruxelles: Editions de l'Université de Bruxelles.

Hogh, A. & Andrea D. (2001). Coping with bullying in the workplace, *European Journal of Work and Organizational Psychology*, *10*(4), 485–495. doi: 10.1080/13594320143000825

Huyez-Levrat, G. (2007). 'Jeunes vendeurs' contre 'vieux techniciens', des compétences spécifiques ou des trajectoires divergentes? *Formation Emploi*, *99*(3), 47–60.

INRS (Institut National de Recherche et de Sécurité) (2018/2015). Dossier: *Risques Psychosociaux (RPS)*, disponible en ligne. Retrieved from http://www.inrs.fr/risques/psychosociaux/consequences-salaries.html

Karpman, S. B. (1968). Fairy tales and script drama analysis. *Transactional Analysis Bulletin*, *7*(26), 39–43.

Kuipers, B. S., Higgs, M., Kickert, W., Tummers, L. et al. (2014). The management of change in public organizations: A literature review. *Public Administration*, *92*(1), 1–20. doi: 10.1111/padm.12040

Langley, A. (1999). Strategies for theorizing from process data. *The Academy of Management Review*, *24*(4), 691–710. doi: 10.2307/259349

Lazarus, R. S. (1992). Coping with the stress of illness. *WHO Regional Publications. European Series*, (44), 11–31.

Lazarus, R. S. & Folkman, S. (1984). Coping and adaptation. In W. D. Gentry (Ed.), *The handbook of behavioral medicine* (pp. 282–325). New York, NY: Guilford.

Leymann, H. (1996). *Mobbing : La persécution au travail*. Paris: Seuil.

Lhuilier, D. (2002). *Placardisés des exclus dans l'entreprise*. Paris: Seuil.

Lincoln, Y. S. & Guba, E. G. (1985). Establishing trustworthiness. *Naturalistic Inquiry*, *289*(331), 289–327.

Linstead, S. (2013). Organizational bystanding: Whistleblowing, watching the work go by or aiding and abetting? *M@n@gement*, *16*(5), 680–696. doi: 10.3917/mana.165.0680

Lutgen-Sandvik, P. (2006). Take this job and…: Quitting and other forms of resistance to workplace bullying. *Communication Monographs*, *73*(4), 406–433. doi: 10.1080/03637750601024156

Malochet, G. (2007). La féminisation des métiers et des professions. Quand la sociologie du travail croise le genre. *Sociologies Pratiques*, (1), 91–99. doi: 10.3917/sopr.014.0091

Miles, M. B., Huberman, A. M. & Saldana, J. (2013). *Qualitative data analysis*. London: Sage.

Miossec, Y. (2011). Le métier comme instrument de protection contre les risques psychosociaux au travail: le cas d'ingénieurs managers de proximité. *Le Travail Humain 74*(4), 341–363. doi: 10.3917/th.744.0341

Moriceau, J. L. (2003). La répétition du singulier : Pour une reprise du débat sur la généralisation à partir d'études de cas. *Revue Sciences de Gestion*, (36), 113–140.

Mucchielli, L. (2008). Une société plus violente? *Déviance et Société*, *32*(2), 115–147. doi: 10.3917/ds.322.0115

Neuman, J. H. & Baron, R. A. (1998). Workplace violence and workplace aggression: Evidence concerning specific forms, potential causes, and preferred targets. *Journal of Management*, *24*(3), 391–419. doi: 10.1177/014920639802400305

Notelaers, G., De Witte, H. & Einarsen, S. (2010). A job characteristics approach to explain workplace bullying. *European Journal of Work and Organizational Psychology*, *19*(4), 487–504. doi: 10.1080/13594320903007620

Paillé, P. & Mucchielli, A. (2005). *L'analyse qualitative à l'aide des catégories conceptualisantes. L'analyse qualitative en sciences humaines et sociales*. Paris: Armand Collin.

Pezé, S. (2014). Les managers à l'épreuve de la souffrance de leurs collaborateurs : De la compassion à la régulation. *La Revue des Conditions de Travail, ANACT,* (1), 171–178.

Pichault, F. & Schoenaers, F. (2012). Le middle management sous pression. *Revue Internationale de Psychosociologie et de Gestion des Comportements Organisationnels*, *18*(45), 121–150. doi: 10.3917/rips1.045.0121

Pinto, J. (2014). Expanding the content domain of workplace aggression: A three-level aggressor–target taxonomy. *International Journal of Management Reviews*, *16*(3), 290–313. doi: 10.1111/ijmr.12021

Poilpot-Rocaboy, G. (2000). Le processus du harcèlement professionnel. *Revue Française de Gestion*, *127*, 31–51.

Pruvost, G. (2008). Le cas de la féminisation de la Police nationale. *Idées Economiques et Sociales*, *153*(3), 9–19. doi: 10.3917/idee.153.0009

Reynaud, J. D. (1997/1989). *Les règles du jeu. L'action collective et la régulation sociale*. Paris: Armand Colin.

Robinson, S. L., O'Reilly, J. & Wang, W. (2013). Invisible at work: An integrated model of workplace ostracism. *Journal of Management*, *39*(1), 203–231. doi: 10.1177/0149206312466141

Rondeau, A. (2008). L'évolution de la pensée en gestion du changement : Leçons pour la mise en œuvre de changements complexes. *Télescope*, *14*(3), 1–12.

Sainsaulieu, R., Francfort, I., Osty, F. & Uhalde, M. (1995). *Les mondes sociaux de l'entreprise*. Paris: Desclée de Brouwer.

Sandberg, J. (2005). How do we justify knowledge produced within interpretive approaches?. *Organizational Research Methods*, *8*(1), 41–68. doi: 10.1177/1094428104272000

Sekerka, L. E., Bagozzi, R. P. & Charnigo, R. (2009). Facing ethical challenges in the workplace: Conceptualizing and measuring professional moral courage. *Journal of Business Ethics*, *89*(4), 565–595. doi: 10.1007/s10551-008-0017-5

Sigaut, F. (1990). Folie, réel et technologie. *Techniques et Culture*, *15*, 167–179. doi: 10.4000/tc.753

Sirota, A. (2017). *Pervers narcissiques : Comprendre, déjouer, surmonter*. Paris: Le Manuscrit.

Suddaby, R. (2006). From the editors: What grounded theory is not. *Academy of Management Journal*, *49*(4), 633–642. doi: 10.5465/amj.2006.22083020

Tajfel, H., Billig, M. G., Bundy, R. P. & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology*, *1*(2), 149–178. doi: 10.1002/ejsp.2420010202

Tarde, G. (1993)[1890]. *Les lois de la contagion imitative*. Paris: Kimé Editeur.

Uhalde, M. (2005). Crise de modernisation et dynamique des identités de métier dans les organisations. *La Revue de l'Ires*, *47*(1), 135–154. doi: 10.3917/rdli.047.0135

Uhalde, M. (2016). *Crise sociale et transformation des entreprises*. Paris: L'Harmattan.

Van de Ven, A. (1992). Suggestions for studying strategy process: A research note. *Strategic Management Journal*, *13*(7), 483–498. doi: 10.1002/smj.4250131013

Wu, L.-Z., Yim, F. H., Kwan, H. K. & Zhang, X. (2012). Coping with workplace ostracism: The roles of ingratiation and political skill in employee psychological distress. *Journal of Management Studies*, *49*(1), 178–199. doi: 10.1111/j.1467-6486.2011.01017.x

Yin, R. K. (2009). *Case study research: Design and methods*. Thousand Oaks, CA: Sage.

Zapf, D. & Gross, C. (2001). Conflict escalation and coping with workplace bullying: A replication and extension. *European Journal of Work and Organizational Psychology*, *10*(4), 497–522. doi: 10.1080/13594320143000834

Appendices

M@n@gement

ORIGINAL RESEARCH ARTICLE

Value Creation and Value Appropriation in Innovative Coopetition Projects

Paul Chiambaretto[1*], Jonathan Maurice[2], and Marc Willinger[3]

[1]MRM-Montpellier Business School and i3-CRG, Ecole Polytechnique, CNRS, Montpellier, France; [2]TSM-Research, Toulouse Capitole University, CNRS, France; [3]CEE-M, University of Montpellier, CNRS, INRA, SupAgro, Montpellier, France

Abstract

This article provides a formal model of the value creation-appropriation dilemma in coopetition for innovation, that is, alliances among competing firms. The model determines the levels of cooperation that maximize the profit of each firm in an innovative coopetition agreement regardless of the number of firms and their respective budget endowments dedicated to the coopetitive project. We answer the following questions: within an innovative coopetition agreement, will the partners cooperate more or less when their budget endowments change? What is the impact on profit? When is it profitable to accept a new partner into the agreement? What happens to the remaining firms when a partner withdraws from the agreement? We show that when the coopetitive budget of the focal firm increases, the focal firm allocates a larger part of this budget to value creation activities and increases its profit. In contrast, when a partnering firm increases its coopetitive budget, the focal firm reduces its budget for value creation activities to maintain a sufficient budget for value appropriation activities. We also show that the addition of a competitor with a large coopetitive budget to the innovative coopetition agreement decreases the cooperation of the focal firm but increases the profit of the initial partnering firms. In contrast, the exit of a partnering firm with a large coopetitive budget from the agreement intensifies the cooperation among the remaining firms but reduces their profit.

Keywords: *Coopetition; Value creation; Value appropriation; Innovative coopetition projects; Game theory*

Handling Editor: Simon Porcher. Received: 19 February 2019; Accepted: 9 December 2019; Published: 2 June 2020

Increasingly more firms rely on alliances between competitors to accelerate their development and foster innovation. Because these alliances present several particularities, a specific stream of literature has emerged around the concept of 'coopetition' (Brandenburger & Nalebuff, 1996; Bengtsson & Kock, 2000; Fernandez, Chiambaretto, Le Roy, & Czakon, 2018; Gnyawali & Park, 2011). Coopetition can be defined as a paradoxical situation in which firms compete in some activities, markets, or products but simultaneously cooperate regarding other activities. Coopetition is supposed to generate superior performance for the partnering firms as it combines the benefits of cooperation and competition (Ritala, 2012). However, coopetition also generates strong tensions between the participating firms (Fernandez, Le Roy, & Gnyawali, 2014; Tidström, 2014), which are mainly driven by the conflict between generating shared benefits and capturing private benefits (Ritala & Hurmelinna-Laukkanen, 2018; Ritala & Tidström, 2014). Nevertheless, several scholars have argued that instead of attempting to reduce these tensions, firms must accept and manage them because their outcomes can be highly beneficial if these tensions are managed properly (Bengtsson, Raza-Ullah, & Vanyushyn, 2016; Le Roy, Fernandez, & Chiambaretto, 2018; Le Roy & Czakon, 2016).

The ability to manage coopetition implies that firms can find the correct balance between value creation and value appropriation strategies (Gnyawali & Ryan Charleton, 2018; Park, Srivastava, & Gnyawali, 2014). Although the claim that cooperative and competitive behaviors should be balanced is often made, few studies have analyzed in detail the nature and specifics of this balance. The existing contributions analyzing this balance remain mainly qualitative (Gnyawali & Park, 2011; Ritala & Tidström, 2014), or when quantitative assessments are made, they are done at the firm level and not at the coopetitive agreement level (Park et al., 2014). Moreover, despite

***Corresponding author:** Paul Chiambaretto, Email: p.chiambaretto@montpellier-bs.com

several calls for further analysis of the value creation-appropriation tension (Bengtsson & Kock, 2014; Chou & Zolkiewski, 2018; Ritala & Hurmelinna-Laukkanen, 2018; Ritala & Tidström, 2014), little academic attention has been devoted to the details of the budget allocation between cooperation and competition.

Our aim is therefore to provide a theoretical framework that allows a discussion and analysis of the determinants of the balance between value creation and value appropriation within innovative coopetition projects. To do this, we develop a formal model based on a game-theoretical approach. We focus on allocative decisions of partners in a coopetitive agreement by modeling each partnering firm's choice as a decision about how to allocate a given amount of their budget between a common creative activity and a private appropriation activity. That is, we focus on budget allocations that are conditional on being a member of the coopetitive agreement, and we do not consider a firm's decision to enter or leave a coopetitive agreement. We frame the budget allocation strategies as a standard one-stage noncooperative game. Each firm chooses an allocation that is a best response to the budget allocation chosen by the other partners.

Our research differs from previous contributions regarding the value creation/appropriation dilemma in coopetition along several dimensions. First, contrary to previous articles that provide a qualitative assessment of the balance between cooperative and competitive behaviors, our game-theoretical approach allows us to capture the strategic uncertainty that surrounds managers' decisions in an innovative coopetition agreement. By doing this, we identify the equilibrium allocation of the budget for each participant involved in the agreement between value creation activities and value appropriation activities. Second, while previous game-theory models were decomposing such agreements in two phases as a two-stage game (compete-then-cooperate or cooperate-then-compete), we adopt a single-stage approach to take into account the specificities stemming from the simultaneity of competition and cooperation in coopetition. By doing so, we provide a stronger analysis of the dilemma between value creation and appropriation by putting the tension between these two objectives in the core of the analysis. Third, contrary to previous research that assumed that value creation and value appropriation behaviors were independent, we adopt a perspective in which the partnering firms have a limited budget such that allocation decisions made for value creation are made at the expense of value appropriation. Fourth, consistent with a recent stream of research inviting researchers to investigate coopetitive agreements involving more than two partners, our modeling allows us to analyze the value creation/appropriation dilemma in settings involving more than two partners with different sizes or budgets. Finally, in contrast to previous articles identifying a specific balance in a given situation, our approach allows us to realize some comparative statics and answer various questions, such as the following: will the focal firm cooperate more or less when its budget dedicated to coopetitive activities increases? What is the impact of such a change on its profit? What is the impact of an increase in the coopetitive budget of a partner firm on the focal firm's cooperativeness and profit? To what extent is it profitable for firms belonging to an established coopetition agreement to accept a new partner into the agreement? What are the consequences for a firm that remains in the agreement if a partner withdraws from it?

We show that there is a unique Nash equilibrium budget allocation for each firm, which depends on the number of firms and their dedicated budgets. In addition, we show that the Nash budget allocations and profits evolve according to some key factors. When the focal firm's dedicated budget (to the coopetitive project) increases, it allocates a larger fraction of it to value creation activities and increases its profit. By contrast, when a partnering firm increases its budget, the focal firm reduces its investment in value creation activities to increase its appropriation capacity. As the partner increases its budget dedicated to coopetition, the focal firm sees its Nash profit increase. Finally, we show that the entry of a new competitor into an existing coopetitive agreement reduces the focal firm's investment in the coopetitive project and increases the profit for the initial partners only if the incomer's coopetitive budget is sufficiently large. Symmetrically, the exit of a standing partner is profitable for the remaining firms only if the exiting partner has a relatively small coopetitive budget.

Our research contributes to the growing literature on coopetition and innovation by offering a formal model that allows us to study the incentives for competing firms to cooperate with one another to create common appropriable value. More precisely, we provide a theoretical analysis of the value creation/appropriation dilemma in a simultaneous cooperation-competition game between heterogeneous firms. To our knowledge, this paper is the first to develop a formal analysis of this value creation/value appropriation dilemma that offers clear theoretical predictions for firms' coopetitive strategies in a one-stage game. Our very generic model allows us not only to characterize the equilibrium for any fixed number of firms but also to study how it evolves when the structure of the agreement changes.

Theoretical background

Combining cooperative and competitive behaviors in coopetition strategies

As a growing number of firms cooperate with competitors (Fernandez et al., 2018), the concept of coopetition has been developed to analyze and understand the specificities of these strategies (Brandenburger & Nalebuff, 1996).

Accordingly, coopetition can be defined as "a paradoxical relationship between two or more actors simultaneously involved in cooperative and competitive interactions, regardless of whether their relationship is horizontal or vertical" (Bengtsson & Kock, 2014, p. 182). Because it combines the benefits of cooperative and competitive behaviors (Bengtsson & Kock, 2000; Lado, Boyd, & Hanlon, 1997), coopetition is expected to yield superior performance compared to other relational modes. Although several contributions indeed find a positive impact of coopetition on innovation performance (Bouncken & Kraus, 2013), market performance (Robert, Chiambaretto, Mira, & Le Roy, 2018), or stock-market performance (Wu, Luo, Slotegraaf, & Aspara, 2015), some recent reviews have underlined that coopetition has a mixed impact in terms of performance, either from an innovation (Gast, Hora, Bouncken, & Kraus, 2018) or from a market performance standpoint (Ritala, 2018).

A possible explanation of these mixed results comes from the presence of multiple coopetitive tensions felt at different levels (Fernandez et al., 2014; Tidström, 2014). Because the partnering firms are competitors, they have to address contradictory and paradoxical incentives that force them to sufficiently cooperate to create value while competing to capture enough value (Fernandez & Chiambaretto, 2016). To avoid self-destructive behaviors, several contributions have noted that coopetitors need to manage these tensions if they want to make it a successful strategy (Le Roy & Czakon, 2016; Le Roy et al., 2018). In this vein, Park et al. (2014) show that the firms that can find the right balance between their collaborative and competitive efforts tend to exhibit higher innovation performance.

Specificities of value creation and value appropriation in coopetition

In their seminal contribution, in addition to introducing the term 'coopetition', Brandenburger and Nalebuff (1996) underline the tensions related to the cooperative dimension of value creation and the competitive dimension of value appropriation. By using the metaphor of a cake, they explain that the cooperative side of coopetition increases the size of the cake, whereas the competitive side increases the size of the slice. That is, tensions between cooperation and competition are driven by the conflict between generating shared benefits and capturing private benefits (Ritala & Hurmelinna-Laukkanen, 2018; Ritala & Tidström, 2014). It is interesting to note that even if the cooperative side of coopetition generates common benefits for the partnering firms, the allocation of the efforts between value creation and value appropriation activities is not made in concert with the coopetitors (Ritala & Hurmelinna-Laukkanen, 2018). Consequently, each firm has to find the optimal budget allocation to maximize its profit (at the expense of the other partnering firms). By building on Lavie (2007), we define value creation as the value generated by the relationships with partners as they collectively pursue shared objectives. In contrast, value appropriation determines the relative share of the relational rents that the focal firm can appropriate.

Even if partners must also decide how they will share and appropriate the relational rent generated by the cooperation in alliances between noncompetitors (Adegbesan & Higgins, 2011) under coopetition, the value appropriation patterns are very different. The main specificity comes from the simultaneity of cooperative and competitive behaviors (Gnyawali & Ryan Charleton, 2018). Simultaneity can be understood in two ways. First, simultaneity can be understood as the fact that two firms cooperate in some markets, while they remain at the same time competitors in other markets. For instance, Le Roy and Fernandez (2015) emphasize how Astrium (Airbus Group) and Thales fully cooperated on a satellite program (Yahsat) while remaining in competition for other satellite markets. In this situation, each parent firm has to make a decision on the amount of budget (and engineer time) to allocate to the common project on the one hand and to the competing activity on the other hand. In parallel, simultaneity can be understood as the situation in which two firms cooperate on a joint product while developing, at the same time, unique knowledge, features, or competencies that will be used to improve the joint product so that they will have a larger market share than their coopetitor. For example, Gnyawali and Park (2011) explain how Sony and Samsung allocated teams to develop in cooperation a new Liquid Crystal Display (LCD) technology for televisions while having in parallel other teams that worked on specific features that would allow Sony to develop a better final LCD product than Samsung. In this case, a single decision is made at the beginning of the product development stage to determine how to optimally allocate the budget (or the team members) between the cooperative and competitive activities.

Regardless of the simultaneity approach adopted, several contributions that have focused on the value creation/appropriation dilemma have concluded that cooperative and competitive behaviors must be balanced (Bengtsson et al., 2016; Gnyawali & Ryan Charleton, 2018; Le Roy et al., 2018; Park et al., 2014; Ritala & Hurmelinna-Laukkanen, 2018; Ritala & Tidström, 2014). Most of these papers are theoretical or qualitative contributions such that they define balance as "evenness between competition and cooperation" (Gnyawali & Ryan Charleton, 2018, p. 2522). This concept of balance is quite blurry and yields general recommendations that state that partners must share resources and knowledge for the success of the common project while keeping sufficient resources for themselves to remain able to differentiate their offer from their competitors' offer in other projects. In that

vein, Gnyawali and Ryan Charleton (2018, p. 2526) conclude that "a firm with more intent for firm value creation may prevent the joint pie from reaching its full potential, while pursuit of joint value creation may similarly hinder firm benefits."

To the best of our knowledge, the only quantitative contribution addressing this question of balance in coopetitive agreements is a study conducted by Park et al. (2014). The authors of this study first argue that "balance helps to maintain and control the relationship and at the same time increases the chances of realizing gains provided by both competition and collaboration" (p. 213). Accordingly, they expect firms that have a balanced behavior to present higher performance levels. Using the Securities Data Company (SDC) Platinum database, they show that firms that adopt a balanced coopetition strategy (with simultaneously a high degree of competition and a high degree of cooperation) tend to have a superior innovation performance. However, their measure of "balance" raises methodological questions as it is a mere multiplication of the competition and cooperation variables that are respectively measured as the degree of market commonality between the two firms (for the competition variable) and the number of repeated ties between the two firms (for the cooperation variable). Furthermore, Park et al. (2014)'s investigation is made at the firm level and not at the dyadic (or agreement) level so that they do not actually investigate the value creation and value appropriation behaviors within a given coopetition agreement.

Despite several calls for further analysis of the value creation-appropriation tension in coopetition (Bengtsson & Kock, 2014; Chou & Zolkiewski, 2018; Ritala & Hurmelinna-Laukkanen, 2018; Ritala & Tidström, 2014), to the best of our knowledge, no study has investigated the details of the budget split between cooperation and competition within coopetition projects. In this research, we investigate how firms actually decide to allocate their budget to cooperative or competitive activities in coopetition projects. By doing so, contrary to previous contributions that provide either a qualitative or firm-level assessment of the 'balance' firms need to reach, we aim at determining precisely the balance associated with each coopetitive agreement and observe how this balance evolves when key parameters change (number of partners involved, budget dedicated to the coopetitive project, etc.).

However, determining the optimal budget allocation between value creation and value appropriation activities is challenging and requires a specific modeling approach.[1]

[1]. In this article, we do not aim at investigating the trade-off between coopetitive and private activities (which would match with the first approach of simultaneity). Nevertheless, we provide some discussion regarding this situation in Appendix 1.

Modeling the trade-off between value creation and value appropriation in coopetition

As explained by Ritala and Hurmelinna-Laukkanen (2009, 2018), some of the theoretical underpinnings of coopetition are rooted in the economics literature regarding conflict and appropriation, particularly contest games with endogenous prizes (see Garfinkel & Skaperdas 2007 for a survey). This stream of literature, which is sometimes referred to as "Guns versus Butter," was initiated by Haavelmo (1954) and was mainly developed by the contributions of Hirshleifer (1989, 1991). The basic idea is that heterogeneously endowed agents must cooperate to produce goods jointly (e.g., butter) in a world of anarchy (without property rights); therefore, they must also privately build appropriation capacity (e.g., guns) to secure a share of the commonly produced goods. One of the striking results of this literature is the "paradox of power" (Hirshleifer, 1991), which equalizes the payoffs of asymmetric players. At equilibrium, resource heterogeneity leads poorly endowed agents to invest a larger share of their resources in producing guns rather than butter, while the well-endowed agents prefer the opposite allocation. The paradoxical result arises because the marginal return from appropriation is larger for poorly endowed players, whereas the marginal return from joint production is larger for the well-endowed. Nevertheless, modeling the trade-off between value creation and value appropriation in coopetition requires considering several specificities of coopetition strategies.

First, models based on sequential games fail to properly capture the resource allocation dilemma inherent to coopetitive agreements. Such models assume a sequential ordering of cooperation and competition: either an initial cooperative stage is followed by a competition stage (e.g., D'Aspremont & Jacquemin, 1988; Grünfeld, 2003; Kamien & Zang, 2000) or an initial competition stage is followed by a cooperative stage (Brandenburger & Stuart, 2007; Gans & Ryall, 2017; MacDonald & Ryall, 2004; Panico, 2017). Let us refer to these two approaches as 'cooperate-then-compete' and 'compete-then-cooperate'. By breaking the coopetition dilemma into two stages, the dilemma actually becomes cleared. In the *cooperate-then-compete* literature, duopoly players choose their level of output in stage 2 (conditional on total R&D investments in stage 1), and then solve for their individually optimum level of R&D investment in stage 1. Solving the game by backward induction eliminates the dilemma. In the *compete-then-cooperate* literature, players built their appropriation capacity in stage 1 before bargaining in stage 2 to share a commonly created value. Again, by solving the game backwardly, the tension between appropriation capacity building (stage 1) and value creation (stage 2) is eliminated. Our aim is to focus on the dilemma between value creation and appropriation by putting the tension between these two objectives in the core

of the analysis. This tension between value creation and appropriation has been identified as the key issue of coopetitive agreements (Fernandez et al., 2014; Gnyawali & Ryan Charleton, 2018; Ritala & Tidstrom, 2014). To enhance the saliency of the tension between value creation and value appropriation, we need to rely on single-stage noncooperative game modeling.

Second, contrary to most models, which assume unlimited resources or budget, we assume that firms' budgets (or efforts) are limited. During strategic planning, firms decide how to allocate their limited resources among value creation and value appropriation activities. Therefore, both types of activities are interdependent. As explained by Gnyawali and Ryan Charleton (2018, p. 2526), "past a certain point, the finite nature of resources means that efforts to push joint value creation will occur at the expense of firm value creation and vice versa." Accordingly, our modeling will require firms to make a trade-off between value creation and value appropriation activities because of their finite budget.

Third, whereas most previous contributions considered partners of similar sizes or similar bargaining powers, we follow Panico's (2017) advice to allow for heterogeneous power positions of partners in an alliance. Recent articles have emphasized an increasing number of coopetitive agreements between firms of different sizes (Chiambaretto, Bengtsson, Fernandez., & Näsholm, 2020; Hora, Gast, Kailer, Rey-Marti, & Mas-Tur, 2018). We therefore consider in our model partner firms of different sizes (measured by the heterogeneity of their dedicated budgets for the coopetitive project).

Finally, in contrast to most contributions that investigate coopetition in dyadic agreements (Dorn, Schweiger, & Albers, 2016), we follow the invitation by Ansari, Garud, and Kumaraswamy (2016) and Rouyre and Fernandez (2019) to study the case of multilateral or multipartner coopetition in which more than two competitors are involved in the agreement. Such configurations are particularly interesting as they reveal how the competitor's behavior changes according to their budget allocated to the coopetitive project and their own agenda.

A formal model of coopetition for innovation

The setting

We define an innovative coopetition agreement (a consortium or a joint venture) as a set of K competing firms ($K \geq 2$) that simultaneously cooperate on a joint project and compete. This agreement can either be a traditional dyadic coopetitive agreement ($K = 2$) or a setting of multipartner coopetition ($K \geq 3$) that involves three or more competing firms. Each of the K competing firms decides how to allocate its dedicated budget to the coopetitive project (the coopetitive budget hereafter) between value creation activities and value appropriation activities. We assume that value creation activities reflect cooperation, while value appropriation activities are related to competition.

Let us note that n_i is the dedicated budget of firm i to the coopetitive project. Although in real coopetitive projects, the resources dedicated to the coopetitive project have multiple dimensions, for example, money, time, skills, or technologies, for the purpose of our model, we assume that these dimensions can be converted into money and thus be considered as a budget. This implies that we abstract from the substitutability/complementarity dimension of the resources by considering them as fungible. Considering K firms, the set of coopetitive budgets available to all firms for the project is the set of K-uple vector $n = (n_1, n_2, ..., n_k)$. Let $N = \sum_{i=1}^{i=K} n_i$. We denote $\alpha_i \in [0,1]$, the share of firm i's budget allocated to value creation in the coopetitive project.[2] Firm i therefore invests amount $\alpha_i n_i$ of its budget in the joint project for value creation and keeps $(1-\alpha_i)n_i$ for appropriation activities.

We assume that the total value created by the coopetitive project is equal to the sum of the investments in the cooperative activities.[3] The total value of the project is $V(\alpha_i, \alpha_{-i})$, which is a function of firm i's cooperative decision α_i and the other firms' cooperative decisions α_{-i}:

$$V(\alpha_i, \alpha_{-i}) = \sum_{j=1}^{j=K} \alpha_j n_j. \qquad (1)$$

We assume that $V(\alpha_i, \alpha_{-i})$ is increasing in α_i and α_{-i}. This specification implies that the partners' budgets are substitutable.[4]

Regarding the appropriation behavior, we assume that the ability of firm i to appropriate value from the joint project positively depends on two types of factors: exogenous factors and endogenous ones. Indeed, following Cohen and Levinthal (1990) or Ritala and Hurmelinna-Laukkanen (2013), we note that the absorptive capacity and the appropriation capability is the result of firm-specific exogenous factors and of endogenous factors

[2] Strictly, the extreme cases for which a firm does not cooperate at all ($\alpha_i = 0$) or does not compete at all ($\alpha_i = 1$) cannot be considered as coopetition according to our definition which requires simultaneous cooperation and competition. However, for the sake of mathematical completeness, we also discuss these two extremes.

[3] To account for empirical evidence that coopetition projects yield higher returns, a multiplicative factor can be added to our definition of the created value without changing the results of the paper.

[4] More generally, our model assumes two types of substitutability: within-firm and across-partners. Within-firm substitutability refers to the allocation of a firm's budget between value creation and value appropriation, while across-partners substitutability refers to the interchangeability of the contributions to value creation.

related to the specific agreement. The appropriation function in our model takes into account these two factors which we assume to be independent: (1) a firm-specific and exogenous organizational capacity in appropriating the value created collectively (this organizational capacity represents, for instance, unique knowledge, features, bargaining power, strategic importance, or specific competencies that will be used to improve the joint product and obtain a larger market share than partners); and (2) an agreement-specific endogenous capacity that depends positively on the amount of the firm *i*'s budget that was not invested in value creation to be kept for the value appropriation. Referring to the theoretical literature, the firm-specific capacity is related to the compete-stage of the *compete-then-cooperate* approach, while the agreement-specific capacity is related to the compete-stage of the *cooperate-then-compete* approach.

From a mathematical standpoint, the exogenous appropriation capacity is expressed in relative terms to better capture that the focal firm's appropriation capacity depends upon the appropriation capacity of the other partners. Considering *K* firms, the set of organizational appropriation characteristics of all firms is the *K*-uple vector $\mu = (\mu_1, \mu_2, \cdots, \mu_K)$, which is divided by the sum of its elements such that we define the organizational appropriation capacity as the *K*-uple vector $M = (M_1, M_2, \cdots, M_K)$, where $M_i = \frac{\mu_i}{\sum_{j=1}^{j=K} \mu_j}$. The exogenous appropriation capacity of firm *i* increases with μ_i and decreases with μ_{-i}. In parallel, the endogenous ability to appropriate is positively affected by the budget that the firm does not dedicate to value creation, that is, $(1-\alpha_i)n_i$, and negatively affected by the amount of the partners' budget kept for appropriation, that is, $(1-\alpha_{-i})n_{-i}$. We thus define the value appropriation capacity of firm *i*, A_i, as a function of the vector $\alpha = (\alpha_1, \alpha_2, \ldots, \alpha_K) \equiv (\alpha_i, \alpha_{-i})$ for the focal firm *i*. The set of possible coopetitive agreements is given by $A = \{\alpha, \alpha_i \in [0,1] \text{ for } i = 1, \ldots, K\}$. Let us note $\alpha^0 = (0, 0, \ldots, 0)$ for the null vector and $\alpha^1 = (1, 1, \ldots, 1)$ for the full contribution vector. For our purpose, we rely on contest functions (Buchanan, Tollinson, & Tullock, 1980) and adopt the following specification:

$$A_i(\alpha_i, \alpha_{-i}) = \begin{cases} M_i \cdot \dfrac{(1-\alpha_i)n_i}{\sum_{j=1}^{j=K}(1-\alpha_j)n_j} \text{ if } \alpha \neq \alpha^0 \text{ and } \alpha \neq \alpha^1 \\ 1/K \text{ if } \alpha = \alpha^0 \\ 0 \text{ if } \alpha = \alpha^1. \end{cases} \quad (2)$$

The appropriation function $A_i(\alpha_i, \alpha_{-i})$ decreases in α_i, which indicates the trade-off that firms have to make in terms of budget allocation between value creation and appropriation activities. This appropriation function can be seen as a way to model the competition between the differentiated products. As in any contest game, when the focal firm invests more in its appropriation activities, its likelihood of being chosen by consumers increases such that its 'market share' will be larger in the market generated by the coopetitive project.

The profit of firm *i* from the coopetitive project depends on the common value created by all partners (*V*) and its appropriation capacity (A_i) as follows:

$$\begin{aligned} \pi_i(\alpha_i, \alpha_{-i}) &= V \cdot A_i \\ &= \sum_{l=1}^{l=K} \alpha_l n_l \cdot M_i \cdot \frac{(1-\alpha_i)n_i}{\sum_{j=1}^{j=k}(1-\alpha_j)n_j} \\ &= M_i \cdot \sum_{l=1}^{l=K} \alpha_l n_l \cdot \frac{(1-\alpha_i)n_i}{\sum_{j=1}^{j=K}(1-\alpha_j)n_j}, \end{aligned} \quad (3)$$

where M_i is a firm-specific parameter that is strictly positive. Note that for α^0 and α^1, $V = 0$ such that each firm makes zero profit from the coopetitive agreement. If $\alpha_i = 1$, $A_i = 0$ and firm *i* makes zero profit. Therefore, $\alpha_i = 1$ cannot be a profit-maximizing solution for firm *i*. On the other hand, firm *i* can eventually choose $\alpha_i = 0$, that is, firm *i* can be better off by contributing zero to value creation and instead by appropriating maximally. In the next section, we discuss the conditions for which such a solution arises within a coopetitive agreement.

Two comments about our specification of the profit functions are required. First, we assume that firms do not incur specific fixed costs for the coopetitive project. Although fixed costs are relevant, we assume that such costs are associated with the focal firm itself rather than with the coopetitive project (Gnyawali & Park, 2011). Second, we assume that $\mu = (\mu_1, \mu_2, \ldots, \mu_K)$ is exogenous, that is, these parameters are not affected by the budget allocations of the coopetitive firms. From a dynamic perspective, this implies that the firm-specific organizational capacities to appropriate value do not change over the duration of the coopetitive agreement either during the coopetitive stage or during the competitive stage.

Balancing between value creation and value appropriation activities in innovative coopetition projects

Building on the game-theoretical approach initiated by Brandenburger and Nalebuff (1996),[5] we look for the

[5] See Okura and Carfi (2018) for a recent survey of coopetition and game theory.

equilibrium in terms of value creation and value appropriation that maximizes the profit of each partnering firm. We therefore focus on the profit of the focal firm *i*. Obviously, because the firms interact with one another, the relevant equilibrium concept is the Nash equilibrium, where the assumption is that each firm chooses a strategy that is a best response to its expectations about its partners' strategies. The Nash equilibrium of the model solves the following system of first-order conditions (FOC) where $K \geq 2$:

$$\forall K \geq 2, \forall n_i > 1,$$
$$\frac{\partial \pi_i}{\partial \alpha_i} = \frac{\partial A_i}{\partial \alpha_i} V + A_i \frac{\partial V}{\partial \alpha_i} = 0, \forall i = 1, \ldots, K. \quad (4)$$

The first term is firm *i*'s marginal return of increasing its share devoted to the common value creation, and the second term is its marginal return of increasing its endogenous appropriation capacity. As discussed above, the first term is positive, and the second term is negative. Therefore, at equilibrium, firm *i* equalizes the marginal return of the value creation activity to the marginal return of the appropriation activity.

Once detailed, we have the following FOC:

$$\frac{\partial \pi i}{\partial \alpha i} = M_i \left[\frac{(1-\alpha_i) n_i^2 N - n_i \left[\sum_{j=1}^{j=K} (1-\alpha_j) n_j \right] \left(\sum_{j=1}^{j=k} \alpha_j n_j \right)}{\left[\sum_{j=1}^{j=K} (1-\alpha_j) n_j \right]^2} \right]$$
$$= 0, \forall i = 1, \ldots, K. \quad (5)$$

Solving this system provides the firms' best reply functions that define the optimal share of the budget to invest in value creation (the proof is given in Appendix 2):

$$\alpha_i^* = \begin{cases} \frac{K^2-(K-1)}{K^2} - \frac{K-1}{K^2} \cdot \frac{N_{-i}}{n_i} & \text{if } n_i > \sum_{j \neq i} n_j \cdot \frac{K-1}{K^2-(K-1)}, \\ 0 & \text{otherwise} \end{cases} \quad (6)$$

At the Nash equilibrium, we can identify the amount of the dedicated budget $(\alpha_i^* n_i)$ that is allocated to value creation by each firm and the amount that is retained for appropriating the common value created by the project, that is, $(1-\alpha_i^*)n_i$. It is interesting to observe that at equilibrium, the fraction allocated by firm *i* to common value creation is decreasing in other firms' total budgets (N_{-i}) and increasing in firm *i*'s total budget for the coopetitive project (n_i). This fact has implications on firm *i*'s reaction to a change in the distribution of budgets across partners. Expression (6) shows that if n_i is sufficiently small, α_i^* could eventually become negative. By assumption, however, α_i^* is constrained to be non-negative. The corner solution $\alpha_i^* = 0$ is chosen by firm *i* if its budget allocated for the coopetitive project is small relative to the aggregate budget of the other members. For instance, in the case of a dyad, from a mathematical standpoint, firm *i* should free-ride on firm *j* if $n_i \leq \frac{1}{3} n_j$. Note that firm *j* has nevertheless an incentive to invest in the coopetitive project as long $\alpha_j M_j > 1$. More generally, any firm *i* for which $n_i < \frac{K-1}{K^2-(K-1)} \cdot \sum_{j \neq i} n_j$ chooses $\alpha_i^* = 0$.

Given the equilibrium values of investment shares α_i^* for each firm *i*, one can also easily compute the equilibrium profit (π_i^*) of each firm:

$$\pi_i^* = M_i \cdot \frac{\sum_{j=1}^{j=K} \alpha_j^* n_j}{K}. \quad (7)$$

Note that the profits reached by the partnering firms differ only because of their different exogenous and specific capacity to appropriate value. Therefore, under such equal capacity, the coopetitive project leads to the remarkable outcome that profits are equalized among all firms. The equilibrium outcome is based on the assumption that the amount of the budget allocated by each firm to the coopetitive project is common knowledge – that is, the information regarding the firms' budget for coopetition is fully transparent.

Comparative statics

In this section, we investigate the impact of various parameters on the incentives for firm *i* to cooperate. More precisely, we study how the firms' budget allocated to the coopetitive project and the number of firms involved in the agreement affect the individual decision to cooperate. We consider the variations of the parameter values (firm budget and number of firms in the agreement) as exogenous shocks because our aim is not to analyze the origin of these variations but only their impact on the firms' cooperative choice within the coopetitive agreement. The comparative statics of firm *i*'s equilibrium (α_i^*, π_i^*) allow us to answer the following questions. (1) How is the budget allocation of firm *i* affected by an increase in its dedicated budget (n_i)? That is, does a firm's cooperativeness increase if its budget

dedicated to the coopetitive project increases? How does this affect its profit? (2) To what extent is it profitable to involve (eliminate) an additional (standing) partner in the coopetitive agreement? What is the corresponding impact on the cooperation level?

Focal firm's budget and cooperativeness

In most alliances and coopetition agreements, partners tend to have different budget sizes that can be allocated to the alliance or coopetition projects. A very rich literature has studied the implications of asymmetric alliances for the degree of cooperation among partners and the stability of the agreement (Vandaie & Zaheer, 2014; Yang, Zheng, & Zhao, 2014). However, most studies in the coopetition literature consider partners of equal sizes and therefore do not address the effect of the heterogeneity of partners' size on their cooperativeness (see Hora et al. [2018] or Chiambaretto et al. (2020) for recent exceptions). Our framework allows us to address this issue at equilibrium: does a larger coopetitive budget of the focal firm increase its propensity to cooperate in the coopetitive project?

Recall that a larger budget represents an increase in n_i. To assess the impact of an increase in n_i on the cooperativeness of firm i, we examine the sign of $\frac{\partial \alpha_i^*}{\partial n_i}$. We find that

$$\frac{\partial \alpha_i^*}{\partial n_i} = \frac{(K-1)\cdot \sum_{\forall j \neq i} n_j}{(Kn_i)^2} > 0. \quad (8)$$

A possible interpretation for the positive sign of the derivative relies on the fact that when the focal firm's budget increases, it can create more value and enlarge the size of the market for the coopetitive project by investing more in cooperation while keeping the same share of its coopetitive budget to appropriate the jointly created value. Firms with larger budgets are thus more willing to create value in coopetition than firms with more modest budgets since they know that they can appropriate this value because of their larger budget to differentiate and distribute the final product.

This leads us to the following proposition:

Proposition 1a. *An increase in the coopetitive budget of the focal firm leads to an increase in the fraction of the focal firm's budget invested in value creation.*

Focal firm's budget and profit level

Regarding profit, the comparative statics allow us to establish that a larger coopetitive budget of the focal firm increases the focal firm's profit. Accordingly, we have

$$\frac{\partial \pi_i^*}{\partial n_i} = \frac{M_i}{K}\cdot\left(\sum_{j=1}^{j=K} \frac{\partial \alpha_j^*}{\partial n_i} n_j + \alpha_i^*\right)$$

$$\frac{\partial \pi_i^*}{\partial n_i} = \frac{M_i}{K}\cdot\left(-\frac{(K-1)^2}{K^2} + \frac{(K-1)\cdot\sum_{\forall j\neq i} n_j}{K^2 n_i} + \frac{K^2-(K-1)}{K^2} - \frac{K-1}{K^2}\cdot\frac{\sum_{\forall j\neq i} n_j}{n_i}\right) \quad (9)$$

$$\frac{\partial \pi_i^*}{\partial n_i} = \frac{M_i}{K^2} > 0 \cdot$$

When the focal firm's coopetitive budget becomes larger, it increases the percentage of this budget allocated to the value creation activity. Even if the level of cooperation of the partners decreases in the focal firm's budget ($\frac{\partial \alpha_j^*}{\partial n_i} < 0$, see below), this effect is compensated by the joint increase in α_i^* and n_i. This trade-off between investing more budget in cooperation to create more joint value (which consequently also benefits the other firms) and saving the budget for appropriation ends in favor of investing most of the additional budget in cooperation instead of competition. This leads to Proposition 1b.

Proposition 1b. *An increase in the coopetitive budget of the focal firm increases its profit in the coopetitive agreement.*

Partner firm's budget and focal firm's cooperativeness

We now adopt the opposite perspective and consider instead an increase in a partner's coopetitive budget on the level of cooperation of the focal firm. When cooperating with firms that allocate larger budgets to the coopetition project, the focal firm may face different issues, especially with respect to appropriating the value created in the coopetitive agreement (Bae & Gargiulo, 2004; Yang et al., 2014). To assess the impact on cooperativeness of the focal firm when a partner's coopetitive budget increases, we determine the sign of $\frac{\partial \alpha_i^*}{\partial n_j}$.

We find that

$$\frac{\partial \alpha_i^*}{\partial n_j} = -\frac{K-1}{K^2 n_i} < 0. \quad (10)$$

The negative sign means that an increase in the budget of a firm i's partner reduces the focal firm's proportion of the budget dedicated to value creation. Consequently, the focal firm keeps more budget to appropriate to the jointly created value.

Firms with smaller coopetitive budgets thus face greater challenges related to value appropriation in alliances with partners that have larger budgets. Keeping more budget to appropriate value allows firms with a lower dedicated budget to maintain their profitability in the coopetitive project. A firm that has less budget vis-à-vis other firms must save it in the cooperative game (value creation) to increase its market share for value appropriation while benefiting from the greater cooperative investments of the other firms (whose budgets are comparatively larger). We thus state the following proposition.

Proposition 2a. *A uniform increase in a partner's coopetitive budget reduces the focal firm's cooperativeness.*

Partner firm's budget and focal firm's profit level

Although an increase in the partner firm's coopetitive budget reduces the focal firm's cooperativeness, we suspect that such adjustment is profitable. We can show that the increase of a partner's dedicated budget positively affects the focal firm's profit. Let us compute the sign of $\frac{\partial \pi_i^*}{\partial n_j}$:

$$\frac{\partial \pi_i^*}{\partial n_j} = \frac{M_i}{K} \cdot \left(\sum_{k=1}^{k=K} \frac{\partial \alpha_k^*}{\partial n_j} n_k + \alpha_j^* \right)$$

$$\frac{\partial \pi_i^*}{\partial n_j} = \frac{M_i}{K} \cdot \left(\sum_{k \neq j} \frac{\partial \alpha_k^*}{\partial n_j} n_k + \frac{\partial \alpha_j^*}{\partial n_j} n_j + \alpha_j^* \right)$$

$$\frac{\partial \pi_i^*}{\partial n_j} = \frac{M_i}{K} \cdot \left(-\frac{(K-1)^2}{K^2} + \frac{(K-1) \cdot \sum_{\forall k \neq j} n_k}{K^2 n_j} + \frac{K^2 - (K-1)}{K^2} - \frac{K-1}{K^2} \cdot \frac{\sum_{\forall k \neq j} n_k}{n_j} \right) \quad (11)$$

$$\frac{\partial \pi_i^*}{\partial n_j} = \frac{M_i}{K^2} > 0 \cdot$$

This leads to the following proposition.

Proposition 2b. *An increase in the coopetitive budget of one of the focal firm's partners increases the focal firm's profit in the coopetitive agreement.*

In the case of the partners' budget (at least one) becoming larger, the focal firm invests less in cooperation to preserve its monetary resources to face stronger competitors, whereas the partners whose budgets have increased invest more in value creation. The end of the adjustment process leads to an increase not only in the partner firm's profit (Prop 1b) but also in the focal firm's profit. From a global standpoint, a more (less) important coopetitive budget given to the firms if they are considered together, regardless of their distribution among the partners, increases (decreases) the profit of all participating firms.

Number of partners and focal firm's cooperativeness

Although most coopetitive agreements involve only two actors, one can observe an increasing number of coopetitive agreements that involve more than two competing firms. Different contributions have emphasized the existence of "network coopetition" (Padula & Dagnino, 2007) or coopetition in ecosystems (Gueguen, 2009). When more than two firms are involved in the coopetitive project, that is, in the presence of multipartner coopetition, the question of the optimum set of partners arises. If more firms are involved, it simultaneously increases the budget for the joint project and the strength of competition among the partners (Chiambaretto & Dumez, 2016; Das & Teng, 2002; Heidl, Steensma, & Phelps, 2014; Lazzarini, 2007). The question of the optimum set of partners is therefore a complex issue. Here, we address a somewhat simpler issue about whether adding (removing) an outside (a current) partner to (from) an already existing agreement positively or negatively influences the profit and cooperativeness of its members. We first assess the impact on cooperativeness, that is, the fraction of the budget allocated to value creation, from a change in the set of partners. We first consider the addition of a new partner before considering the removal of an existing partner.

The marginal impact of an additional member (the $K+1$th firm) on the level of cooperation of partner i of the standing coopetitive agreement crucially depends on the newcomer's level of dedicated budget. Let us compute the sign of the difference: $\alpha_i^{*(K+1)} - \alpha_i^{*(K)}$. We obtain

$$\alpha_i^{*(K+1)} - \alpha_i^{*(K)} = \frac{(K+1)^2 - K}{(K+1)^2} - \frac{K}{(K+1)^2} \cdot \frac{N + n_{K+1} - n_i}{n_i} - \frac{K^2 - (K-1)}{K^2} + \frac{K-1}{K^2} \cdot \frac{N - n_i}{n_i}$$

$$= \frac{N(K^2 - (K+1)) - K^3 n_{K+1}}{(K+1)^2 n_i K^2} \cdot \quad (12)$$

We obtain

$$\begin{cases} \alpha_i^{*(K+1)} - \alpha_i^{*(K)} > 0, \text{ if } n_{K+1} < N \frac{K^2 - (K+1)}{K^3}, \\ \alpha_i^{*(K+1)} - \alpha_i^{*(K)} \leq 0, \text{if } n_{K+1} \geq N \frac{K^2 - (K+1)}{K^3}. \end{cases} \quad (13)$$

According to condition (13), the sign of the difference depends on the coopetitive budget of the new partner. If the new partner's budget is smaller (respectively larger) than some threshold value that depends on the overall budget of the members of the existing agreement (N), the focal firm increases (respectively decreases) its level of cooperation. Thus, by creating more (respectively less) value, the standing members of the agreement compensate for the potential loss (respectively gain) incurred by a larger number of partners involved in the sharing. If the new partner's coopetitive budget is relatively small, the historical members are not threatened by its entrance in the agreement. Therefore, the focal firm can increase its cooperative investment in common value creation. However, if the new partner's coopetitive budget is relatively large, its competitive power threatens the value appropriation capacity of the standing partners. They react by lowering their cooperative investment to secure sufficient appropriation capacity while counting on the new partner to create more value. Figure 1 represents the boundary percentage of N for n_{K+1} that makes the other K firms increase or decrease their α^* by standardizing N to 1.[6]

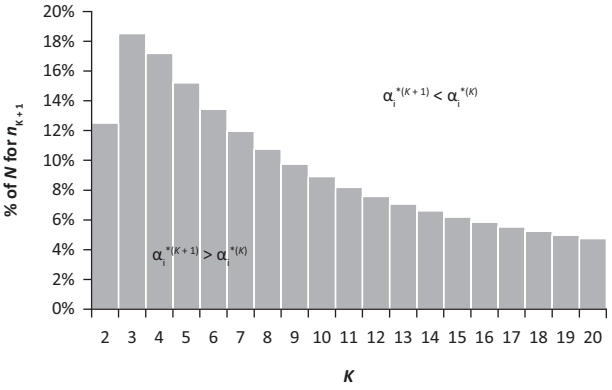


Figure 1. Budget of the new partner in the percentage of N that determines the increase or decrease of α_i^* for the other firms

Note: $\frac{K^2-(K+1)}{K^3}$ represents the boundary percentage of $N=\sum_{i=1}^{i=K} n_i$ for the budget of the new partner (n_{K+1}), which determines the increase or decrease of the other firms' Nash cooperative investments (α_i^*). K is the number of cooperative firms before the cooperation of a new partner.

Two opposite effects drive the evolution of the boundary, namely, a budget effect (*i*) and a size effect (*ii*). Adding a new partner to the agreement (*i*) increases the potential budget to create common value, which allows firms to be less cooperative (α decreasing) and still create more value overall, but the size effect (*ii*) also increases the number of partners that appropriate this value, which pushes firms to be more cooperative (increasing α) to create more value and maintain at least the same level of profit. In our case, moving from a two-firm agreement to a three-firm agreement makes the size effect (*ii*) greater than the budget effect (*i*), which is reversed when moving from a three-firm agreement to a four-(or more)-firm agreement. Roughly, moving from two to three firms represents an increase of 50% (which is relatively huge), while moving from three to four firms represents an increase of 25%. This explains why the boundary increases between $K = 2$ and $K = 3$ while decreasing otherwise.

Based on these results, we state Proposition 3a.

Proposition 3a. *Adding a new partner to an existing coopetitive agreement increases the focal firm's cooperativeness if and only if the new partner's budget is sufficiently small (i.e., below the boundary percentage of N displayed in Figure 1).*

We can also interpret this result from the reverse perspective. What occurs if a firm exits the agreement? The corollary of Proposition 3a suggests that the remaining firms increase (resp. decrease) their cooperation levels if the exiting firm's budget is larger (respectively lower) and decrease their cooperation levels if they lose a partner with a small coopetitive budget.

Corollary of Proposition 3a. *Removing a partner from an existing coopetitive agreement increases the focal firm's cooperativeness if and only if the exiting partner's budget is sufficiently large (i.e., above the boundary percentage of N displayed in Figure 1).*

Number of partners and the focal firm's profit level

Regarding profit, it is crucial to understand the impact of adding a new partner to the standing coopetitive agreement on the profit of the focal firm. The Nash profit is determined by budget $\alpha_i^* n_i$ invested in cooperation for value creation:

$$\alpha_i^* n_i = \frac{n_i(K^2-(K-1))}{K^2} - \frac{K-1}{K^2}\cdot(N-n_i) = n_i - N\frac{K-1}{K^2}. \qquad (14)$$

Firm i's profit, as a function of K, is given by

$$\pi_i^*(K) = M_i \cdot \frac{\sum_{j=1}^{j=K}\alpha_j^* n_j}{K} = M_i \cdot \frac{\sum_{j=1}^{j=K}\left(n_j - N\frac{K-1}{K^2}\right)}{K} = M_i \cdot \frac{N}{K}\left(1-\frac{K-1}{K}\right). \qquad (15)$$

After adding a new partner to the agreement, the profit of the focal firm i becomes

[6] These results are satisfied for all $K > 1$ since $\lim_{K\to+\infty}\frac{K^2-(K+1)}{K^3}=0$. Even if K is very large, the boundary remains above 0 ($K^2 - (K + 1) > 0$ for all $K > 1$), which means that there is always at least one case where cooperation can increase with the number of players (as long as the $K + 1$th firm has a coopetitive budget very close to 0).

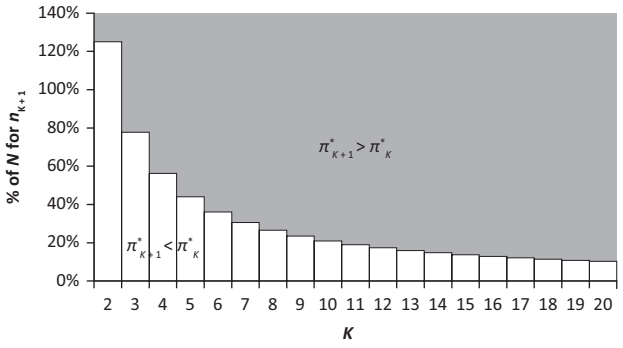


Figure 2. Budget of the new partner in the percentage of N that determines the increase or decrease of π^* for the other firms

Notes: $\frac{2K+1}{K^2}$ represents the boundary percentage of $N = \sum_{i=1}^{i=K} n_i$ for the budget of the new partner (n_{K+1}), which determines the increase or decrease of the other firms' Nash profit (π^*). K is the number of cooperative firms before the cooperation of a new partner.

$$\pi_i^*(K+1) = M_i \cdot \frac{N+n_{k+1}}{K+1}\left(1-\frac{K}{K+1}\right). \tag{16}$$

To assess the impact of the addition of a partner on the Nash profit of the focal firm, let us determine the sign of $\pi_i^*(K+1) - \pi_i^*(K)$. Observe that

$$\begin{aligned}\pi_i^*(K+1)-\pi_i^*(K) &= M_i \cdot \left(\frac{N+n_{k+1}}{K+1}\left(1-\frac{K}{K+1}\right)-\frac{N}{K}\left(1-\frac{K-1}{K}\right)\right) \\ &= M_i \cdot \frac{K(N+n_{k+1})\frac{1}{K+1}-N(K+1)\frac{1}{K}}{K(K+1)}.\end{aligned} \tag{17}$$

We obtain

$$\begin{cases} \pi_i^*(K+1)-\pi_i^*(K) > 0, \text{ if } n_{K+1} > N\frac{2K+1}{K^2}, \\ \pi_i^*(K+1)-\pi_i^*(K) \le 0, \text{ if } n_{K+1} \le N\frac{2K+1}{K^2}. \end{cases} \tag{18}$$

For instance, if $K = 2$, then the two standing firms benefit from cooperating with a third partner only if the new partner has a very large coopetitive budget ($n_{K+1} > \frac{5}{4}N$). Figure 2 shows the evolution of this threshold as K increases. When the number of initial partners is small, the additional partner's budget must be very large to increase the Nash profit of the focal firm. The threshold appears to decrease at approximately 10% of N when K is approximately equal to 20 firms in the coopetitive game. The threshold is always positive but approaches 0 when K reaches infinity.[7] Thus, when a small number of firms sign the coopetitive agreement, the initial partners usually do not have sufficient incentives to accept an additional partner, unless it provides a very large coopetitive budget. Conversely, losing a partner with a large budget decreases the profit of the remaining firms; however, losing a partner with a relatively small budget is always profitable for them.

These results allow us to formulate the following propositions.

Proposition 3b. *Adding a new partner to a standing coopetitive agreement increases the Nash profit of the focal firm if and only if the new partner's dedicated budget is sufficiently large (i.e., above the boundary percentage of N displayed in Figure 2).*

Corollary of Proposition 3b. *Removing a partner from an existing coopetitive agreement increases the focal firm's profit if and only if the exiting partner's budget is sufficiently small (i.e., below the boundary percentage of N displayed in Figure 2).*

Before discussing the implications of these results in the following section, Table 1 provides a summary of the results of the comparative statics of the model showing whether there is a positive or negative relationship among the budget size of the focal firm, the budget size of the other partners, the entry or exit of a partner with a small or a large coopetitive budget in the agreement, and the cooperation level and profit of the focal firm.

Discussion

Finding the right balance between value creation and value appropriation in the coopetition for innovation

The existing literature on coopetition has emphasized the necessity to find the right balance between value creation and value appropriation activities to maximize the focal firm's innovation performance (Park et al., 2014; Ritala & Hurmelinna-Laukkanen, 2018; Ritala & Tidström, 2014). However, these contributions remained mainly qualitative (Gnyawali & Park, 2011; Ritala & Tidström, 2014) or when quantitative assessments were made, the level of analysis was not at the agreement level (Park et al., 2014). Despite several calls to investigate this issue more deeply, there has been a lack of research on how firms can find this optimal balance. Our research answers this call by investigating the value creation/appropriation dilemma in coopetition and provides several key differentiating contributions. First, our game-theoretical approach allows us to identify the equilibrium allocation of the budget for each

[7] This means that when K is very large, there is always at least one case where profits can increase with the number of partners if the $K+1$th firm has a coopetitive budget very close to 0.

Table 1. Summary of the comparative statics: changes in the cooperation level and profit according to the focal firm's budget size, partner firms' budget size, and number of partners

	Focal firm	
	Cooperation	Profit
Increase in focal firm's budget size	+	+
Increase in a partner firm's budget size	–	+
A firm with a large budget joins (exits) the agreement	– (+)	+ (–)
A firm with a small budget joins (exits) the agreement	+ (–)	– (+)

Notes: The positive and negative signs indicate, at the equilibrium, a positive or negative change in the cooperation level and profit of the focal firm or its partners in response to a change in the focal firm's budget size and in its partner firms' budget size and the entry (or exit) of a firm with a large or small budget in the coopetitive agreement.

participant involved in the agreement between value creation activities and value appropriation activities. Second, in opposition with previous contributions using a two-stage game, we adopt a single-stage approach to take into account the specificities stemming from the simultaneity of competition and cooperation in coopetition. Third, we adopt a perspective in which the partnering firms have a limited budget such that allocation decision made for value creation are made at the expense of value appropriation. Fourth, our modeling allows us to analyze the value creation/appropriation dilemma in settings involving more than two partners with different budgets. Finally, our approach allows us to realize some comparative statics and observe how the equilibrium evolves when the characteristics of the agreement change.

Our research yields several key results. First, we have shown the existence of a unique Nash equilibrium of a coopetitive agreement that determines the amount of budget invested by each member firm in value creation activities and the budget kept by each firm for value appropriation activities. We show that the level of cooperation, that is, the total amount of budget invested cooperatively, depends on the focal firm's coopetitive budget, the partner firms' coopetitive budget and the number of partnering firms. These findings confirm the importance of the variables identified in Ritala and Hurmelinna-Laukkanen (2018) and Ritala and Tidström (2014), even if we go beyond these studies in clarifying their respective roles.

Second, our approach emphasizes a key outcome regarding the distribution of the value created by the coopetitive agreement among partnering firms. At the Nash equilibrium, the profits of the partnering firms tend to become equalized. Specifically, the profits reached by the partnering firms differ only based on exogenous organizational appropriation factors. Therefore, by neglecting such exogenous differences, we obtain the remarkable outcome that profits are equalized among all firms despite their heterogeneity in the dedicated budgets to the coopetitive project. The appropriation capacity measured by firms' relative budgets explains why their opposite incentives (to cooperate or compete more) do not have the same effect on their profit. The incentive to allocate a larger proportion of a firm's budget to cooperation (which increases value creation) is stronger for firms with large budgets than for firms with more modest budgets. This result is noteworthy because it shows how the very nature of coopetition contributes not only to generating tensions but also to regulating them by avoiding unequal sharing schemes (Ritala & Hurmelinna-Laukkanen, 2018). This situation holds if every partner can observe or anticipate the total budget of the other partners (without having access to each individual budget). We further discuss this assumption in the following sections.

Understanding the impacts of the firms' budgets and the number of coopeting firms on the focal firm's cooperativeness and profit

Finding the optimal level of cooperation and the resulting profit in a coopetitive setting also requires an understanding of how firms' strategic reactions evolve according to various parameters. Three variables have been investigated: the focal firm's budget dedicated to the coopetitive project, the partner firm's increase in its budget, and the total number of partnering firms.

First, we show that when the budget of the focal firm increases, the amount of the budget invested cooperatively to create value also increases. A richer focal firm has incentives to foster value creation in the coopetitive project by investing a larger amount of its budget in cooperation while keeping the same amount of budget to appropriate the jointly created value. Richer firms are thus more willing to create value in coopetition than firms with lower budgets. Additionally, we show that when the coopetitive budget of the focal firm increases, the additional value created by the focal firm increases its profit. In this case, more cooperation from the focal firm with the larger budget overcompensates for the decrease in the cooperation of the other partners.

Second, by adopting a symmetrical approach, we have investigated the impact of increasing the budget of a partnering firm

on the focal firm's strategic reaction. Our model allows us to conclude that when the budget of a partner firm increases, the focal firm reduces its share of budget invested cooperatively while keeping more budget to appropriate the joint value. Indeed, partners with relatively smaller budgets face greater challenges regarding value appropriation in alliances with partners that invest a lot in coopetition activities (Yang et al., 2014). Consequently, keeping a larger amount of the budget to appropriate value is the only way for smaller partners to remain profitable in a coopetitive project. Regarding profits, we show that even if a partner firm increases its budget dedicated to the coopetitive project, the focal firm will also see its profit increase. This result contradicts several contributions on asymmetric alliances that state that partnering with a large firm usually reduces the profit of a smaller partner (Bae & Gargiulo, 2004; Vandaie & Zaheer, 2014). We explain this contradiction by noting that most of these previous contributions have focused on value appropriation mechanisms without accounting for the added value of cooperating with a partner that has a larger coopetitive budget. Even if a smaller firm has a lower market share (compared to the initial situation), it also benefits from the increased market size and consequently realizes more profit.

Finally, this research has shown that the impact of adding new members on coopetitive agreements has contrasting outcomes for the initial partners. First, when a new member joins a coopetitive agreement, the focal firm invests a larger share of its budget cooperatively to create value only if the new partner is relatively small (from a budgetary standpoint). In the presence of a small new partner, the focal firm invests a larger share of its budget to create more value and to compensate for the loss of total value that can be appropriated because it is now shared with one more firm. However, if the new partner has a large budget dedicated to the coopetitive project, then this budget represents a threat to the focal firm regarding value appropriation, which leads to a downward adjustment of the focal firm's investment in cooperation to keep a sufficient budget to maintain its market share while expecting the new partner to create more value, which occurs at equilibrium. Regarding profit, the situation is even more complicated. The model allows us to conclude that the focal firm's profit increases only if the new partner is sufficiently large (from a budgetary standpoint). The addition of a new partner makes sense only if it creates more value (by adding enough monetary resources to the common pool) than it appropriates (by dividing the value with an additional partner). Thus, only a large partner appears to allow firms to create more value rather than appropriating it. Consequently, if the partnering firms decide to accept a new member in the coopetitive agreement, then this new partner must bring a sufficiently large coopetitive budget, and such a situation leads to a reduction of the budget cooperatively invested by the partnering firms in value creation.

Conclusion

Our research aimed at understanding how firms balance value creation and value appropriation behaviors in innovative coopetition projects. More precisely, based on a formal framework dedicated to coopetition agreements, we investigated the impacts of firms' budget and the number of partners in the coopetitive agreement on the balance between value creation and value appropriation strategies. In this sense, our article contributes to the coopetition literature by offering new insights into the debate concerning the value creation and value appropriation strategies adopted by coopeting firms (Ritala & Hurmelinna-Laukkanen, 2009, 2018; Ritala & Tidström, 2014) and the tensions that they generate (Fernandez et al., 2014; Fernandez & Chiambaretto, 2016; Tidström, 2014). This vast literature has identified the key determinants of these strategies but has not provided an integrative framework to study their respective impacts on firms' value creation and appropriation strategies. Furthermore, our contribution is one of the first studies that investigates situations of "asymmetric coopetition" in which partners have different sizes and "multipartner coopetition" in which there are three or more partners. Therefore, we emphasize the importance of the relative sizes (from a budgetary standpoint) of the partners in explaining value creation and value appropriation strategies.

Inevitably, our study has a number of limitations. As with any theoretical model, our model is based on a series of assumptions that must be discussed. First, our model allows firms to use and allocate their budget for value creation or value appropriation interchangeably. Most of our results depend on this key assumption of investment substitutability across partners. However, resources dedicated by different firms to a coopetitive project are rarely perfect substitutes and frequently involve complementarities (or synergies) between resources. It would therefore be of interest to extend our model to other settings that allow for complementarities (e.g., with a multiplicative value creation function). Second, our results hold only if the coopetitive budgets of partnering firms are observable and common knowledge. Future research could consider asymmetric information among the partnering firms or develop a model in which the appropriation efforts are more difficult to observe than the value creation efforts. Finally, as with any theoretical paper, further research is needed to empirically assess the validity of our conclusions. This empirical test could be conducted either by relying on existing databases or by running controlled laboratory experiments.

Nevertheless, this research provides new insights regarding the value creation/value appropriation dilemma in coopetition strategies for innovation while identifying promising research avenues for future contributions.

Acknowledgments

The authors would like to thank the Associate Editor Simon Porcher and the anonymous reviewers for their insightful suggestions and comments, which greatly contributed to improve this manuscript. The authors also thank the following researchers for their helpful insights and observations: Jamal Azzam, Héloïse Berkowitz, Anne-Sophie Fernandez, Frédéric Le Roy, Nicola Mirc, and Petros Sekeris.

Conflict of interest and funding

The authors report no conflicts of interest. This research benefitted from the financial support of the Labex Entreprendre.

References

Adegbesan, J. A. & Higgins, M. J. (2011). The intra-alliance division of value created through collaboration. *Strategic Management Journal, 32*(2), 187–211. doi: 10.1002/smj.872

Ansari, S. (Shaz), Garud, R. & Kumaraswamy, A. (2016). The disruptor's dilemma: TiVo and the U.S. television ecosystem. *Strategic Management Journal, 37*(9), 1829–1853. doi: 10.1002/smj.2442

Bae, J. & Gargiulo, M. (2004). Partner substitutability, alliance network structure and firm profitability in the telecommunications industry. *Academy of Management Journal, 47*(6), 843–859. doi: urn:nbn:nl:ui:12-148536

Bengtsson, M. & Kock, S. (2000). "Coopetition" in business networks – To cooperate and compete simultaneously. *Industrial Marketing Management, 29*(5), 411–426. doi: 10.1016/S0019-8501(99)00067-X

Bengtsson, M. & Kock, S. (2014). Coopetition – Quo vadis? Past accomplishments and future challenges. *Industrial Marketing Management, 43*(2), 180–188. doi: 10.1016/j.indmarman.2014.02.015

Bengtsson, M., Raza-Ullah, T. & Vanyushyn, V. (2016). The coopetition paradox and tension: The moderating role of coopetition capability. *Industrial Marketing Management, 53*, 19–30. doi: 10.1016/j.indmarman.2015.11.008

Bouncken, R. B. & Kraus, S. (2013). Innovation in knowledge-intensive industries: The double-edged sword of coopetition. *Journal of Business Research, 66*(10), 2060–2070. doi: 10.1016/j.jbusres.2013.02.032

Brandenburger, A. M. & Nalebuff, B. J. (1996). *Co-opetition: A revolutionary mindset that redefines competition and cooperation* (Vol. 121). New York, NY: Doubleday.

Brandenburger, A. & Stuart, H. (2007). Biform games. *Management Science, 53*(4), 537–549. doi: 10.1287/mnsc.1060.0591

Buchanan, J., Tollinson, R. & Tullock, G. (1980). *Toward a theory of the rent-seeking society*. Texas, US: College Station.

Chiambaretto, P., Bengtsson, M., Fernandez, A.-S. & Näsholm, M. H. (2020). Small and large firms' trade-off between benefits and risks when choosing a coopetitor for innovation. *Long Range Planning*, *53*(1), 101876. https://doi.org/10.1016/j.lrp.2019.03.002

Chiambaretto, P. & Dumez, H. (2016). Toward a typology of coopetition: A multilevel approach. *International Studies of Management & Organization, 46*(2–3), 110–129. doi: 10.1080/00208825.2015.1093797

Chou, H.-H. & Zolkiewski, J. (2018). Coopetition and value creation and appropriation: The role of interdependencies, tensions and harmony. *Industrial Marketing Management, 70*, 25–33. doi: 10.1016/j.indmarman.2017.08.014

Cohen, W. M. & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*(1), 128. doi: 10.2307/2393553

Das, T. K. & Teng, B.-S. (2002). Alliance constellations: A social exchange perspective. *Academy of Management Review, 27*(3), 445–456. doi: 10.5465/amr.2002.7389937

D'Aspremont, C. & Jacquemin, A. (1988). Cooperative and non-cooperative R&D in duopoly with spillovers. *American Economic Review, 78*, 1133–1137.

Dorn, S., Schweiger, B. & Albers, S. (2016). Levels, phases and themes of coopetition: A systematic literature review and research agenda. *European Management Journal, 34*(5), 484–500. doi: 10.1016/j.emj.2016.02.009

Fernandez, A., Chiambaretto, P., Le Roy, F. & Czakon, W. (2018). *The Routledge companion to coopetition strategies*. Abingdon: Routledge.

Fernandez, A.-S. & Chiambaretto, P. (2016). Managing tensions related to information in coopetition. *Industrial Marketing Management, 53*, 66–76. doi: 10.1016/j.indmarman.2015.11.010

Fernandez, A.-S., Le Roy, F. & Gnyawali, D. R. (2014). Sources and management of tension in co-opetition case evidence from telecommunications satellites manufacturing in Europe. *Industrial Marketing Management, 43*(2), 222–235. doi: 10.1016/j.indmarman.2013.11.004

Gans, J. & Ryall, M. D. (2017). Value capture theory: A strategic management review. *Strategic Management Journal, 38*(1), 17–41. doi: 10.1002/smj.2592

Garfinkel, M. R. & Skaperdas, S. (2007). Economics of conflict: An overview. In T. Sandler & K. Hartley (Eds.), *Handbook of defense economics* (pp. 649–710). Amsterdam: Elsevier.

Gast, J., Hora, W., Bouncken, R. B. & Kraus, S. (2018). Challenges and merits of coopetitive innovation. In A. Fernandez, P. Chiambaretto, F. Le Roy & W. Czakon (Eds.), *The Routledge Companion to Coopetition Strategies* (pp. 283–297). Abingdon: Routledge.

Gnyawali, D. R. & Park, B.-J. (2011). Co-opetition between giants: Collaboration with competitors for technological innovation. *Research Policy, 40*(5), 650–663. doi: 10.1016/j.respol.2011.01.009

Gnyawali, D. R. & Ryan Charleton, T. (2018). Nuances in the interplay of competition and cooperation: Towards a theory of coopetition. *Journal of Management, 44*(7), 2511–2534. doi: 10.1177/0149206318788945

Grünfeld, L. A. (2003). Meet me halfway but don't rush: Absorptive capacity and strategic R&D investment revisited. *International Journal of Industrial Organization, 21*(8), 1091–1109. doi: 10.1016/S0167-7187(03)00076-6

Gueguen, G. (2009). Coopetition and business ecosystems in the information technology sector: The example of Intelligent Mobile Terminals. *International Journal of Entrepreneurship and Small Business, 8*(1), 135–153. doi: 10.1504/IJESB.2009.024109

Haavelmo, T. (1954). *A study in the theory of economic evolution*. Amsterdam: North-Holland Publishing Company.

Heidl, R. A., Steensma, H. K. & Phelps, C. (2014). Divisive faultlines and the unplanned dissolutions of multipartner alliances. *Organization Science, 25*(5), 1351–1371. doi: 10.1287/orsc.2014.0898

Hirshleifer, J. (1989). Conflict and rent-seeking success functions: Ratio vs. difference models of relative success. *Public Choice, 63*, 101–112.

Hirshleifer, J. (1991). The paradox of power. *Economics and Politics, 3*, 177–200.

Hora, W., Gast, J., Kailer, N., Rey-Marti, A. & Mas-Tur, A. (2018). David and Goliath: Causes and effects of coopetition between start-ups and corporates. *Review of Managerial Science, 12*(2), 411–439. doi: 10.1007/s11846-017-0273-9

Kamien, M. I. & Zang, I. (2000). Meet me halfway: Research joint ventures and absorptive capacity. *International Journal of Industrial Organization, 18*(7), 995–1012. doi: 10.1016/S0167-7187(00)00054-0

Lado, A. A., Boyd, N. G. & Hanlon, S. C. (1997). Competition, cooperation, and the search for economic rents: A syncretic model. *Academy of Management Review, 22*(1), 110–141.

Lavie, D. (2007). Alliance portfolios and firm performance: A study of value creation and appropriation in the U.S. software industry. *Strategic Management Journal, 28*(12), 1187–1212. doi: 10.1002/smj.637

Lazzarini, S. G. (2007). The impact of membership in competing alliance constellations: Evidence on the operational performance of global airlines. *Strategic Management Journal, 28*(4), 345–367. doi: 10.1002/smj.587

Le Roy, F. & Czakon, W. (2016). Managing coopetition: The missing link between strategy and performance. *Industrial Marketing Management, 53*, 3–6. doi: 10.1016/j.indmarman.2015.11.005

Le Roy, F. & Fernandez, A.-S. (2015). Managing coopetitive tensions at the working-group level: The rise of the Coopetitive Project Team. *British Journal of Management, 26*(4), 671–688. doi: 10.1111/1467-8551.12095

Le Roy, F., Fernandez, A.-S. & Chiambaretto, P. (2018). From strategizing coopetition to managing coopetition. In A. Fernandez, P. Chiambaretto, F. Le Roy & W. Czakon (Eds.), *The Routledge Companion to Coopetition Strategies* (pp. 36–46). Abingdon: Routledge.

MacDonald, G. & Ryall, M. D. (2004). How do value creation and competition determine whether a firm appropriates value? *Management Science, 50*(10), 1319–1333. doi: 10.1287/mnsc.1030.0152

Okura, M. & Carfi, D. (2018). Coopetition and game theory. In A. Fernandez, P. Chiambaretto, F. Le Roy & W. Czakon (Eds.), *The Routledge companion to coopetition strategies* (pp. 139–146). Abingdon: Routledge.

Padula, G. & Dagnino, G. (2007). Untangling the rise of coopetition: The intrusion of competition in a cooperative game structure. *International Studies of Management and Organization, 37*(2), 32–52. doi: 10.2753/IMO0020-8825370202

Panico, C. (2017). Strategic interaction in alliances. *Strategic Management Journal, 38*(8), 1646–1667. doi: 10.1002/smj.2610

Park, B.-J. (Robert), Srivastava, M. K. & Gnyawali, D. R. (2014). Walking the tight rope of coopetition: Impact of competition and cooperation intensities and balance on firm innovation performance. *Industrial Marketing Management, 43*(2), 210–221. doi: 10.1016/j.indmarman.2013.11.003

Ritala, P. (2012). Coopetition strategy – When is it successful? Empirical evidence on innovation and market performance. *British Journal of Management, 23*(3), 307–324. doi: 10.1111/j.1467-8551.2011.00741.x

Ritala, P. (2018). Coopetition and market performance. In A. Fernandez, P. Chiambaretto, F. Le Roy & W. Czakon (Eds.), *The Routledge companion to coopetition strategies* (pp. 317–325). Abingdon: Routledge.

Ritala, P. & Hurmelinna-Laukkanen, P. (2009). What's in it for me? Creating and appropriating value in innovation-related coopetition. *Technovation, 29*(12), 819–828. doi: 10.1016/j.technovation.2009.07.002

Ritala, P. & Hurmelinna-Laukkanen, P. (2013). Incremental and radical innovation in coopetition – The role of absorptive capacity and appropriability. *Journal of Product Innovation Management, 30*(1), 154–169. doi: 10.1111/j.1540-5885.2012.00956.x

Ritala, P. & Hurmelinna-Laukkanen, P. (2018). Dynamics of coopetitive value creation and appropriation. In A.-S. Fernandez, P. Chiambaretto, F. Le Roy & W. Czakon (Eds.), *The Routledge Companion to Coopetition Strategies* (pp. 58–67). Abingdon: Routledge.

Ritala, P. & Tidström, A. (2014). Untangling the value-creation and value-appropriation elements of coopetition strategy: A longitudinal analysis on the firm and relational levels. *Scandinavian Journal of Management, 30*(4), 498–515. doi: 10.1016/j.scaman.2014.05.002

Robert, M., Chiambaretto, P., Mira, B. & Le Roy, F. (2018). Better, faster, stronger: The impact of market-oriented coopetition on product commercial performance. *M@n@gement, 21*(1), 574–610.

Rouyre, A. & Fernandez, A.-S. (2019). Managing knowledge sharing-protecting tensions in coupled innovation projects among several competitors. *California Management Review, 62*(1), 95–120. doi: 10.1177/0008125619885151

Tidström, A. (2014). Managing tensions in coopetition. *Industrial Marketing Management, 43*(2), 261–271. doi: 10.1016/j.indmarman.2013.12.001

Vandaie, R. & Zaheer, A. (2014). Surviving bear hugs: Firm capability, large partner alliances, and growth. *Strategic Management Journal, 35*(4), 566–577. doi: 10.1002/smj.2115

Wu, Q., Luo, X., Slotegraaf, R. J. & Aspara, J. (2015). Sleeping with competitors: The impact of NPD phases on stock market reactions to horizontal collaboration. *Journal of the Academy of Marketing Science, 43*(4), 490–511. doi: 10.1007/s11747-014-0396-3

Yang, H., Zheng, Y. & Zhao, X. (2014). Exploration or exploitation? Small firms' alliance strategies with large firms. *Strategic Management Journal, 35*(1), 146–157. doi: 10.1002/smj.2082

Appendices 1-2

M@n@gement

ORIGINAL RESEARCH ARTICLE

A Literature Review of the Strategic Decision-Making Context: A Synthesis of Previous Mixed Findings and an Agenda for the Way Forward

Said Elbanna*[1], Ioannis C. Thanos[2], and Rob J. G. Jansen[3]

[1]Department of Management and Marketing, Qatar University, Doha, Qatar; [2]Department of Business Administration, Athens University of Economics and Business, Athens, Greece; [3]Department of Organization Studies, Tilburg University, Tilburg, the Netherlands

Abstract

The aim of this article is to conduct a comprehensive literature review concerning the influence of contextual factors on strategic decision processes. Our literature review organizes the existing literature on contextual factors along the lines of an integrative framework for studying strategic decisions. Interestingly, the stream of research on strategic decision processes is dominated by studies showing mixed, contradictory, and inconclusive findings. The effects of each contextual factor on the strategic decision process differ substantially across the reviewed studies. This creates several opportunities for further research on the topic. The review also reveals a paucity of cross-cultural studies, longitudinal studies, and tests of complex relationships such as three-way interactions, curvilinear relationships, and mediation effects. We conclude our review by suggesting seven directions for future research and identifying several implications for theory and practice.

Keywords: *Contextual Factors; Strategic Decision-Making Processes; Literature Review*

Handling Editor: Thomas Roulet. Received: 21 November 2018; Accepted: 26 January 2020; Published: 2 June 2020

Following Mintzberg, Raisinghani, and Théorêt (1976, p. 246), a strategic decision can be defined as one which is "important, in terms of the actions taken, the resources committed, or the precedents set." Such decisions influence the success or failure of organizations (Dean & Sharfman, 1996; Elbanna & Child, 2007a; Walters & Bhuian, 2004). These decisions are formulated and implemented in a context where managers have little power and control (Papadakis, Thanos, & Barwise, 2010). Hence, it is hard to trace their progress until we understand their broader context (Elbanna, Child, & Dayan, 2013). This context is multifaceted, in the sense that the process of making strategic decisions is subject to several factors. Thus, it is very important to study in depth the role of the broader context because its characteristics do not necessarily impinge in isolation on the strategic decision process.

In the strategic management literature, there seems to be a consensus that context refers to sets of characteristics (Elbanna & Child, 2007b; Papadakis et al., 2010) which include those of top management, decision-specific, environment and organization (e.g., Dayan, Elbanna, & Di Benedetto, 2012; Papadakis, Lioukas, & Chambers, 1998).

Previous reviews of the role of context in making strategic decisions create an informative overview of the contextual factors that impinge on strategic decision processes (Elbanna, 2010; Papadakis et al., 2010; Shepherd & Rudd, 2014). The strength of these reviews lies in creating awareness of the integrative approach to context as an explanation for strategic decision processes and the ways in which they factor into the relationship between the process and outcomes of strategic decisions. Furthermore, they help managers to determine which contextual factors should be incorporated in their thinking for certain decisions and subsequent actions. However, these reviews do not contain in-depth discussions of the dimensions of strategic decision process. Even the reviews by Eisenhardt and Zbaracki (1992), Schwenk (1995), and Elbanna (2006), which focus on these dimensions, do not consider contextual influences.

***Corresponding author:** Said Elbanna, Email: selbanna@qu.edu.qa

To overcome the limitations of the above literature reviews, we carried out an in-depth review of the role of context in influencing strategic decision processes. The present review builds on and extends previous work by taking a closer look at the literature on the strategic decision process to identify more fine-grained research opportunities. By keeping the overview function of previous reviews, adding recent studies and exploring the extent to which context allows us to develop further insight into the reasons for mixed findings in this research area, we aimed to be more specific than previous reviews in drawing up a future research agenda. We hope that important areas for further research and appropriate approaches to studying strategic decision processes have been identified. For the present review, our research question is "How do contextual factors influence the strategic decision process?"

This allows for three contributions. First, by bringing together studies from several contextual perspectives, we map the broader context of strategic decision processes and enable an up-to-date integrative overview to be taken of the possible perspectives and the role of individual characteristics in the strategic decision process (Elbanna & Child, 2007b). This integration opens the door to a better understanding of the reason why mixed findings persist. Second, the context perspectives may (due to their nature) be more logical as an antecedent (cause) of process and outcomes than as a boundary condition between process and outcomes (or vice versa). A further exploration of the main effects to see how they are reinforced, alleviated, attenuated, or exacerbated by specific characteristics or context perspectives also allows for a more fine-grained development of the framework. Therefore, by including several perspectives instead of only one researcher on the strategic decision process is more likely to identify reasons for the inconsistencies that are found. In addition, research on strategic decision processes does not provide a clear insight regarding the way in which context perspectives affect one another. For example, the external environment of a firm is connected to its internal environment through boundary spanners (Hautz, 2017; Jansen, Curşeu, Vermeulen, Geurts, & Gibcus, 2013; Jemison, 1984). It is the relationship between context perspectives that is underexplored, in the sense that previous researchers focused on a single perspective, where multiple perspectives and their interrelationships were rarely examined. These then form two contributions that the present research makes. Together they allow us to draw up a third contribution, namely a future research agenda for context aspects in the strategic decision process research. As well as these contributions, practitioners will find more about the role of the various characteristics and perspectives, based on evidence from previous research. This will give them a better chance to disentangle which influences affect their strategic decision process and consequences, and how they do so.

In the next section, we describe the analytical approach and methodology that we used to conduct the literature review. After this, we present the results before identifying several theoretical and practical contributions of this study and outlining promising directions for future research.

Organization and setup of the review

The review is organized around the integrative framework presented in Figure 1. This framework is a set of constituent parts linked together. The context factors on the left-hand side, the decision process in the middle, and the decision outcomes on the right-hand side make up the parts of the framework, and the links indicate the sequential, moderating, mediating, or cyclical nature of the relations between these parts.

Four groups of factors can be distinguished: they are the environmental context, organizational context, nature of the strategic decision, and top management characteristics. The environmental context refers to the external environment (environmental characteristics); the organizational context refers to the internal environment (organizational characteristics); the top management characteristics refer to the characteristics of the decision-makers on an individual or collective basis and the dynamics between them; and the decision-specific characteristics of strategic decision-making refer to the characteristics of the decision (Papadakis et al., 2010). Previous empirical papers have explored and tested the effects of individual characteristics, and literature reviews have grouped and established the different parts of the broader context from which stems its influence on strategic decision processes and outcomes (Rajagopalan, Rasheed, & Datta, 1993; Shepherd & Rudd, 2014).

The decision process refers to the process by which a strategic decision is formulated and implemented, that is, the process that leads to the choice of goals and means and the way that means are effectively deployed (Elbanna, 2006; Noorderhaven, 1995). Formulation concerns the way that the decision comes about, whereas implementation is about the way that the decision is put into action (Elbanna, 2006; Rajagopalan, Rasheed, Datta, & Spreitzer, 1997). Decision outcomes are the intended (Papadakis et al., 1998; Shepherd & Rudd, 2014) and unintended (Elbanna, 2018; Elbanna et al., 2013) consequences of the strategic decision process. Decision outcomes are the results of decision formulation and implementation and represent the direct organizational and social consequences of decision activity. Organizational performance is the actual outcome of the functioning of an organization. These definitions of context, process, and outcomes together form the backdrop against which we can place the individual papers of our review.

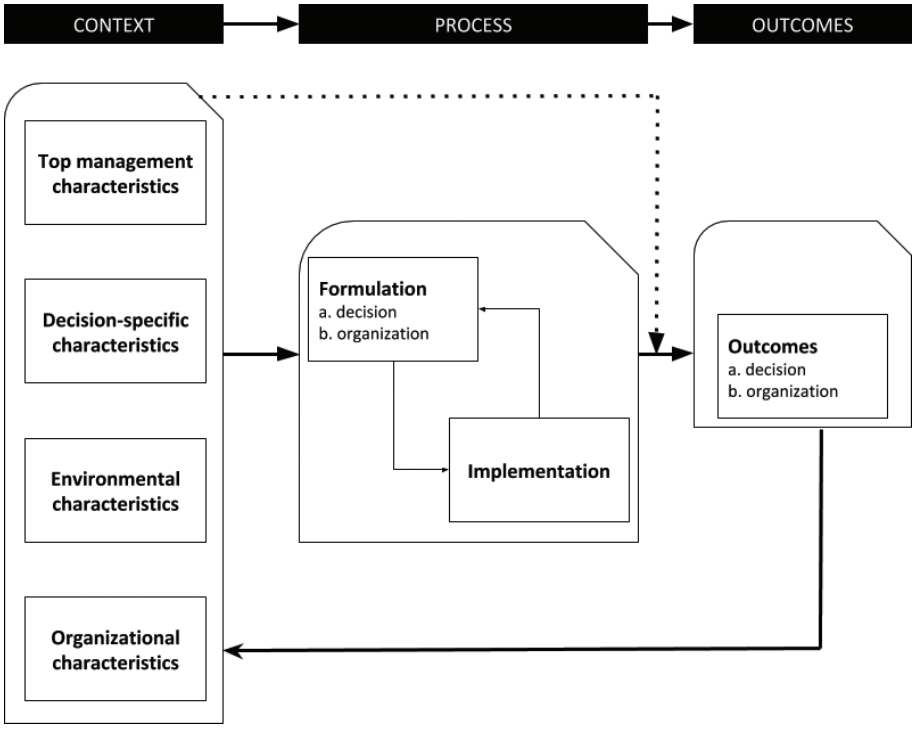


Figure 1. The integrative framework for studying strategic decisions.

Methodology: Sampling and coding

We identified relevant articles by using various keywords in our search of the Social Sciences Citation Index (1988–2018), including strategic decision, strategic decision-making, strategic decision process, decision success, decision outcomes, and strategy process in the 'title' or 'topic' fields. We limited the search to the 'Business' and 'Management' categories in the Index, and we checked the list of references to previous literature reviews, that is, backwards snowballing of the literature (e.g., Eisenhardt & Zbaracki, 1992; Elbanna, 2006; Papadakis et al., 2010; Rajagopalan et al., 1993; Shepherd & Rudd, 2014). The papers were retrieved through the EBSCO, ProQuest, Emerald, Science Direct, and JSTOR Business databases. Our systematic literature review resulted in 87 papers. These papers were included in the review if they had one or more concepts that fit one or more context perspectives, were about strategic decision processes, and were empirical in nature. Figure 2 reports the step-by-step search and selection process. Next, the included studies were coded in terms of their correspondence to the contextual factors included in the study.

Contextual perspectives: Review of the literature

The strategic decision process literature distinguishes four contextual perspectives, as shown in Figure 1. These are the perspectives of top management (strategic or management choice), decision-specific characteristics, environmental determinism (environmental characteristics), and organizational characteristics. Factors incorporated in these perspectives directly influence the strategic decision process or moderate the relationship between the strategic decision process and its outcomes. The following sections create an overview of the four contextual perspectives and the empirical studies identified within each of these perspectives.

Top management characteristics

This perspective refers to the properties of the "top management team as the dominant coalition of the most senior executives who have responsibility for setting the overall direction of an organization" (Shepherd & Rudd, 2014, p. 343). The external and the internal environments of the firm set limits to the decision process, but the final outcome of decisions is shaped by the top management team (Child, 1997). Several studies have adopted a strategic choice perspective and strategy-as-practice to investigate the effects of the top management team on strategic decision processes (e.g., Asmuß & Oshima, 2018; Elbasha & Wright, 2017; Ericson, 2010; Jansen, Curşeu, Vermeulen, Geurts, & Gibcus, 2011). Other studies, though, have concluded that top management team characteristics may not impact strategic decision processes or that this impact is slight compared to other contextual characteristics (e.g., Lyles & Mitroff, 1980).

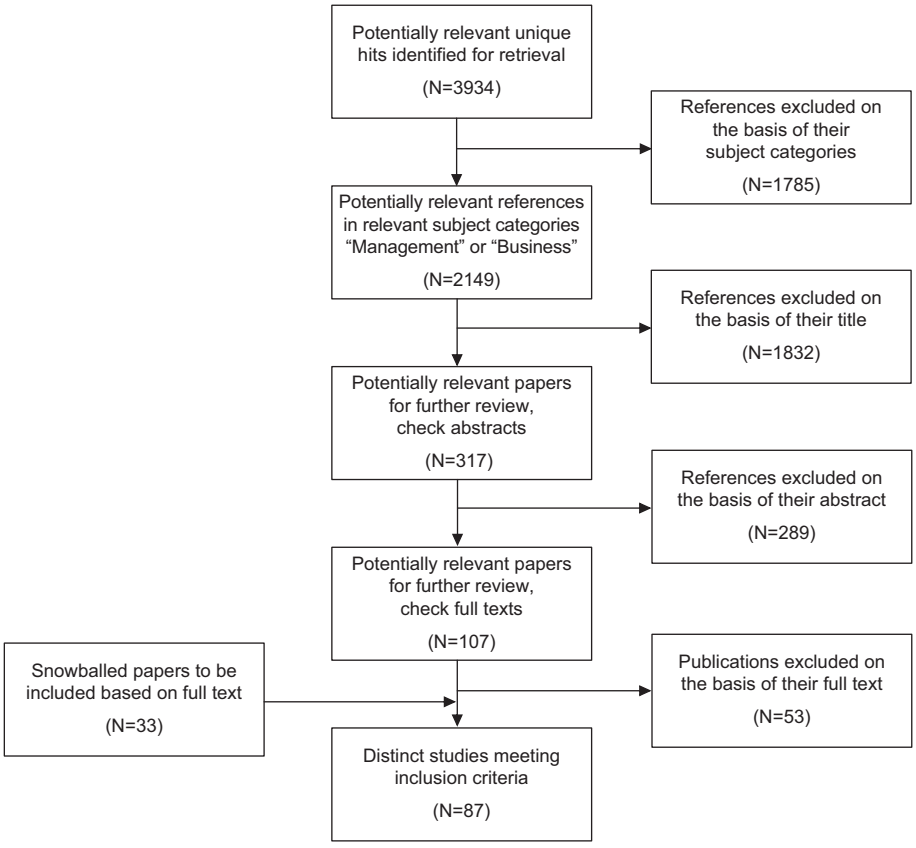


Figure 2. Flow diagram of the literature selection process.

Prior studies have considered either the demographic or the psychological characteristics of decision-makers. In the following paragraphs, we review the effects of both these characteristics on strategic decision processes.

Demographic characteristics

Several demographic characteristics such as gender, age, tenure, and education have been the subject of previous studies of top management teams (Elbanna, 2018). Some studies have investigated the effects of such individual demographic characteristics on strategic decision processes. Others estimate the demographic diversity of top management teams, which refers to the extent to which a top management team is or is not demographically heterogeneous. The advantage of doing research with demographic data is that they are easily accessible to researchers (Finkelstein, Hambrick, & Cannella, 2009). The wider the demographic diversity of the top management team, the greater the chance that this team will use multiple sources of information and perspectives in the decision process (Dutton & Duncan, 1987). At this point, some scholars begin to argue that top management team diversity and performance are positively related (Wiersema & Bantel, 1992). Yet, diversity has its costs since it makes communication more difficult and increases conflict and political behavior (Amason, 1996; Elbanna, 2009).

Generally speaking, recent reviews have concluded that several inconsistent findings have been made with respect to the relationship between demographic variables and strategic choices and strategic decision processes (Bromiley & Rau, 2016; Hambrick, 2007). In the following paragraphs, we review the four most widely used demographic variables in the area of strategic decision processes, namely age, tenure, experience, and educational background.

Age. Age is an important factor affecting strategic decision processes (Finkelstein et al., 2009). On average, older managers appear to be more risk averse than younger ones and incline to more incremental decisions about their organizations (Brouthers, Andriessen, & Nicolaes, 1998; Wiersema & Bantel, 1992). Similarly, Greening and Johnson (1996) argue that younger managers appear to adopt more analytical or rational approaches when making and integrating strategic decisions. Other studies have argued that managers' age is not as

important as tenure in the firm (Bantel, 1993). Surprisingly, Francioni, Musso, and Coppi (2015) find mixed results: age is not related to the rationality dimension of the strategic decision process, but is negatively related to the political behavior of this process.

Similarly, research on the role of age heterogeneity in decision-making showed mixed results, such as a variety of perspectives on decision-making (Wiersema & Bantel, 1992), enhancing the capacity of firms to develop responsive practices in the face of threats (Greening & Johnson, 1996) and having no effect on strategic change (Wiersema & Bantel, 1992).

Tenure. Tenure potentially has the most significant theoretical bearing of all the demographic characteristics on decisions (Finkelstein et al., 2009). It has been linked to organizational performance, innovation, and risk-taking by top management teams (Henderson, Miller, & Hambrick, 2006; Wu, Levitas, & Priem, 2005). Previous upper-echelon studies have measured several different types of tenure (see Finkelstein et al., 2009 for an overview). The most widely studied ones are tenure in the top management team, captured by the number of years the members of the team have worked together; tenure in position, measured by the number of years the executives have been in their position; organizational tenure, measured by the number of years that the executives have worked in the firm and their tenure in the industry representing the time spent in the industry. But our search of the literature found no studies in the strategic decision process area that investigated the effects of industry tenure on strategic decision processes.

Empirical studies have argued that tenure, like age, increases rigidity (Greening & Johnson, 1996). The studies by Fredrickson and Iaquinto (1989) and Goll and Rasheed (2005) conclude that long-tenured top management teams follow more rational approaches to decision-making. Other studies have reached the conclusion that the wider the variation of tenure in the top management team, the more effective the teams are (Greening & Johnson, 1996; Schwenk, 1988; Wiersema & Bantel, 1992).

Experience. In the strategic decision process research, two aspects of experience are important: amount and type. The overwhelming majority of studies focus on the former and not the latter. Fredrickson (1985) reports that contextual factors influence the strategic decision processes of inexperienced executives, although they may not affect the strategic decision processes of experienced executives. Similarly, Elbanna and Child (2007b) argue that, contrary to US and British managers, Egyptian managers' limited experience may lead them to focus on managing strategic decisions within their organizational context more than on the environmental variables in which they make them. However, Elbanna and Fadol (2016a) contend that the impact of the contextual variables on the strategic decision process varies from one dimension to another.

The amount of experience in Dutch small and medium-sized enterprises (SMEs) leads to more effective decisions if decision-makers are more confident about the decision situation (Jansen et al., 2013), but show no effect if decision-makers are willing to accept more risk in the decision situation. This mixed effect of experience according to the *amount of experience* is not exceptional, for recent studies have also shown that relations between experience measures and the characteristics of the strategic decision process are expected, but are not found. Experience in the top management team (measured as the number of industries in a manager's experience) does not lead to greater potency in the top management team (Clark & Maggitti, 2012). Francioni et al. (2015) found no effects of the CEO's experience on the strategic decision process in Italian SMEs, measured by the number of years, for either the political behavior dimension or that of rationality. This shows that the role of the *amount of experience* is two-edged with regard to explaining the characteristics of the strategic decision process and outcomes. Some limited evidence exists to support the view that the type of experience influences strategic decision processes, as well (Hitt & Ireland, 1986).

Some studies have also focused on the effects of heterogeneity in functional experiences on strategic choices and strategic decision processes. The available empirical evidence holds that heterogeneous teams make better decisions than homogeneous teams do (Greening & Johnson, 1996; Schwenk, 1988). In summary, both the *amount of experience* and the *type of experience* are clearly related to the strategic decision process and outcomes, but in the studies we reviewed they have no similar effect.

Educational background. The educational background of executives determines how they perceive the world, process information, and ultimately make decisions (Hambrick & Mason, 1984). Goll and Rasheed (2005) contend that, because business management education focuses on applying analytical techniques to decision-making, educated managers are initially led to rely on rational strategic decision processes rather than other approaches. Clark and Maggitti (2012) found that the education level in the top management team is positively related to the speed of strategic decision-making through the potency of the team. Francioni et al. (2015) found that higher education levels lead to more rationality in the strategic decision process. Taken together, the education level seems to play a salient role in the strategic decision process, and its impact on decision outcomes goes through process characteristics.

Moreover, the type of education (a.k.a. specialization) is an important determinant of strategic decision processes. A manager's specialism in education forms his/her perspective and outlook (Wiersema & Bantel, 1992). Alkaraan and Northcott

(2006), for example, argue that the specialization of education of CFOs in the UK is reflected in the strategy that their companies follow.

Psychological characteristics

In addition to the demographic characteristics, previous studies have investigated the effects of several psychological characteristics on strategic decision processes, such as locus of control, need for achievement, and risk-taking propensity, which we discuss next.

Locus of control. Rotter, on the basis of social learning theory, developed the locus of control construct, which refers to "individual differences in a generalized belief in internal versus external control of reinforcements" (Rotter, 1966 in Boone, De Brabander, & van Witteloostuijn, 1996, p. 668). While internal individuals feel that they can control their lives, the opposite holds for external individuals (Selart, 2005). Locus of control has been linked in previous studies with several outcomes, including organizational performance, innovative behavior, and export behaviors (e.g., Halikias & Panayotopoulou, 2003). In a pioneering study, Miller, Kets De Vries, and Toulouse (1982) found that firms with internal CEOs emphasize product design innovations through R&D and change their products more frequently than firms with external CEOs. Miller and Toulouse (1986) further argued that internal CEOs favor decentralized strategic decision processes. However, in a study of 204 Hong Kong Chinese managers, Cheng, Rhodes, and Lok (2010) argue that there is no statistically significant relationship between locus of control and rationality in the strategic decision process.

Need for achievement. The need for achievement is a second important personality characteristic. It reflects the tendency of a manager to accomplish tasks and achieve success. "*Achievers* would rather set their own goals, which are of moderate difficulty, than have goals set for them by others" (Hitt, Miller, & Colella, 2009). Moreover, they are ambitious, competitive, and keen to exercise control over the events affecting their lives (Miller, Dröge, & Toulouse, 1988). Based on this desire to control the context in which they operate, "Achievers" favor structural centralization and emphasize formalized strategic decision processes (Lewin & Stephens, 1994). Miller et al. (1988) argued that executives' high need for achievement causes them to aim for their goals in an orderly and systematic way, thus taking a more rational approach, but other writers found no empirical support in a recent study based on Italian SMEs (Francioni et al., 2015); instead, a positive effect of the need for achievement on political behavior was found.

Risk-taking propensity. Some studies have investigated the effect of top managers' risk-taking propensity on strategic decision processes. Wally and Baum (1994), for example, suggest that risk-taking propensity positively influences the pace of evaluating candidates for acquisition. Gilley, Walters, and Olson (2002) concluded that risk taking by the top management team and firm performance are positively related in stable rather than in dynamic settings. Francioni et al. (2015) found that managers' risk attitude positively affects their rationality and political behavior.

Other studies

Quite a few studies have investigated other characteristics besides those mentioned above. For example, Talaulicar, Grundei, and Von Werder (2005) argued that debate by the top management team influences the comprehensiveness of decisions in a positive way. Ashmos and McDaniel (1996) reported that managers should pay attention to questions of both scope and intensity of participation in the decision process. Souitaris and Maestro (2010) found that polychronicity in top management teams, a construct referring to the tendency of top managers to do several tasks simultaneously, positively influences firm performance. This influence is mediated through comprehensiveness and speed. In another study in the Chinese context, it has been argued that speed is positively influenced by a CEO's transformational leadership (Gu, Weng, & Xie, 2012). A CEO's transformational leadership has also been found to exert a positive influence on the comprehensiveness of strategic decision processes (Friedman, Carmeli, & Tishler, 2016), whereas relation leadership positively affects team learning in strategic decision processes (Carmeli, Tishler, & Edmondson, 2012).

Papadakis and Barwise (2002) argued that the characteristics of the CEO (e.g., tenure in position, education, risk-taking propensity) and those of the top management team (i.e., education, competitive aggressiveness) are important determinants of strategic decision processes, with the latter being more important. Another interesting finding was that the broader context (i.e., hostility, firm size, ownership type, decision importance) is more influential in this regard than the CEO or the top management team. Papadakis (2006) concluded that a CEO's demographic characteristics influence strategic decision processes while his/her personality characteristics exert no direct influence. The latter inference is consistent with the findings of Cheng et al. (2010) in the Chinese context, but contradicts the early findings of studies from the US context (e.g., Miller et al., 1988).

The effects of several other psychological constructs on strategic decision processes have been identified in the literature. For example, some limited empirical evidence exists to

support the view that CEO meta-cognition (Mitchell, Shepherd, & Sharfman, 2011), executives' cognitive style (Nutt, 1990, 1993), cognitive complexity (Iederan, Curşeu, & Vermeulen, 2009), shared mental models (Bailey & Peck, 2013), and job anxiety (Mannor, Wowalk, Bartkus, & Gomez-Mejia, 2016) influence strategic decision processes. Clearly, more research is needed before drawing any conclusions.

The decision-specific characteristics perspective

Hutzschenreuter and Kleindienst (2006) point out that the role of decision-specific factors in the strategic decision process has received limited attention from scholars, and hence, it is hard to generalize the results of previous research because of two factors. In this review, we will discuss decision importance, uncertainty, and motive, since these are the most widely studied characteristics in the strategic decision process literature (Fredrickson, 1985; Hickson et al. 1986; Nooraie, 2008).

Decision importance

Some strategic decisions are more important than others (Dean & Sharfman, 1996; Elbanna, 2010; Shepherd & Rudd, 2014), and hence, decision-makers may make strategic decisions in different ways because of the limits on their time and attention. For instance, conventional wisdom would suggest that for strategic decisions that are likely to be very important for the future of the firm, companies will collect great amounts of information and will employ structured and quantitative techniques in analyzing this information. In other words, the higher the decision importance, the higher the level of rationality in the strategic decision processes. A few studies have supported this argument (e.g., Judge & Miller, 1991; Nooraie, 2008). However, Dean and Sharfman (1993a) found that rationality and decision importance are not related to each other. Similarly, Elbanna and Fadol (2016a) report the absence of a significant relationship between decision importance and intuition. The inconclusiveness of this evidence suggests that additional research is necessary to more precisely understand the role of decision importance in the strategic decision process.

Decision uncertainty

Decision-making is characterized by uncertainty (Noorderhaven, 1995). Decision uncertainty exists when decision-makers face complex and novel problems along with unclear relationships between their means and ends (Sharfman & Dean, 1997).

While decision uncertainty increases the use of political behavior (Lyles, 1981; Papadakis et al., 1998) and intuition (Elbanna & Fadol, 2016a) in strategic decision processes, there are two views about its impact on rationality. First, if the decision entails high levels of uncertainty, then managers will employ rational strategic decision processes. The logic behind this is that the only way to reduce uncertainty is by collecting and analyzing great amounts of information from the external and internal environment (Bourgeois & Eisenhardt, 1988). A version of this argument, combined with the politicization reported by Papadakis et al. (1998) and Lyles (1981), can be found in the study by Denis, Dompierre, Langley, and Rouleau (2011).

The second view regarding the relationship between decision uncertainty and rationality suggests that the former reduces the latter (e.g., Dean & Sharfman, 1993a). Uncertainty curtails rationality in strategic decision processes (e.g., Butler, 2002). Two further studies show that decision uncertainty increases the use of intuition (Elbanna, Child, & Dayan, 2013; Hensman & Sadler-Smith, 2011).

Decision motive

Several authors consider whether the strategic decision motive is made in response to an opportunity or to a threat/crisis (Shepherd & Rudd, 2014). Managers react differently if a decision is motivated by an opportunity or a crisis (Hurt & Abebe, 2015; Jackson & Dutton, 1988). Decision motive influences several aspects of strategic decision processes, such as who will be involved, how, when, and the amount of resources that are needed (Ashmos, Duchon, & McDaniel, 1998; Dutton, Stumpf, & Wagner, 1990; Fiegener, 2005). Fredrickson (1985) found that comprehensiveness in strategic decision processes increases if a decision is driven by a crisis. Although decision motive influences several aspects of strategic decision processes such as who will be involved, how, when, and the amount of resources involved (Ashmos et al., 1998; Dutton et al., 1990; Fiegener, 2005), the results in the literature are not consistent and it is hard to generalize (Elbanna & Child, 2007a).

The environmental determinism perspective

According to this perspective, the external environment and its characteristics drive strategic decision processes (Elbanna & Gherib, 2012; Hitt & Tyler, 1991; Le Bris, Madrid-Guijarro, & Martin, 2019). We can divide earlier studies on the role of the environment in the strategic decision process into two categories. The first category contains studies which examine environmental attributes as determinants of the strategic decision process dimensions (Elbanna, 2015; Meissner & Wulf, 2014). The second category contains studies which investigate the moderating role of environmental attributes on the effects of strategic decision processes on outcomes (e.g., Mueller, Mone, & Barker, 2007; Walters & Bhuian, 2004). Before discussing the

role of two important environmental characteristics, environmental uncertainty and hostility, in making strategic decisions, we briefly address how external control may affect the strategic decision process.

External control

External control refers to the influence of external factors, such as government agencies, trade unions, creditors, clients, or suppliers, on organizational activities, including strategic decisions (Child, Elbanna, & Rodrigues, 2010). The assumption with this perspective is that any organization, as part of a larger world, is an open social system which interacts with other parties (Hickson et al., 1986). When decisions are reviewed by outsiders, decision-makers try to persuade those who have control over them that their strategic decision process is rational and their choices are therefore valid (Langley, 1989). Dean and Sharfman (1993a), however, found that external control reduces rationality. A possible explanation of this interesting result is that external control may not provide organizations with the managerial discretion necessary to adopt rationality in strategic decision processes and thus to adapt to or follow institutional logics (Greenwood, Magan Diaz, Li, & Cespedes Lorente, 2010).

Environmental uncertainty

Environmental uncertainty is the combination of two dimensions: dynamism and complexity. Several scholars have highlighted the difficulties of making decisions in dynamic or highly complex situations (Le Bris et al., 2019; Fredrickson & Iaquinto, 1989); hence, environmental uncertainty has received substantial empirical attention from scholars (Elbanna, Kapoutsis, & Mellahi, 2017). Prior scholars, drawing on contingency theory, have argued that uncertainty has a moderating impact on the effects of strategic decision processes on firm performance. However, several inconsistent results have been published. For example, one stream of research has concluded that rationality leads to better outcomes in stable environments (Fredrickson, 1984; Fredrickson & Mitchell, 1984; Hough & White, 2003). Another stream of research has argued in favor of exactly the reverse (e.g., Glick, Miller, & Huber, 1993; Priem, Rasheed, & Kotulic, 1995; Walters & Bhuian, 2004). Finally, several studies (Dayan et al., 2012; Dean & Sharfman, 1996; Elbanna, Ali, & Dayan, 2011; Elbanna & Child, 2007a; Elbanna et al., 2013) have found that uncertainty is not a significant moderator in the relationship between strategic decision processes and performance.

Mitchell et al. (2011) found that while in dynamic environments uncertainty is high and one would expect to find it hard to be consistent in one's judgment, the subjects in their study were more consistent in taking strategic decisions. Elbanna, Di Benedetto, and Gherib (2015a) found that when one faces high unpredictability concerning changes in product demand, the negative effect of political behavior on decision success intensifies. In addition, different types of environmental uncertainty, such as technology uncertainty and sophistication, and demand uncertainty can be distinguished (Atuahene-Gima & Li, 2004; Covin, Slevin, & Heeley, 2001).

To sum up, previous studies have argued that uncertainty can moderate positively, negatively, or not at all the effects of rationality on performance. Several possible methodological reasons (e.g., different ways to operationalize uncertainty and different settings) and substantive reasons (e.g., different conceptualization and other variables incorporated in the research models) may contribute to the explanation of these contradictory results (for more discussion on this issue, see Boyd, Bergh, Ireland, & Ketchen, 2013; Dayan et al., 2012; Elbanna, 2010). The study by Klingebiel and De Meyer (2013) may shed some light on the interplay of environmental uncertainty and the strategic decision process. These writers propose that differences in awareness and uncertainty can explain the observed variation in the strategic decision processes during implementation, that is, the adaptation becomes subject to selectiveness, deliberateness, and diligence. Their study implies that the certainty of a future event and the awareness of this event by the decision-maker play a major role in whether the strategic decision process becomes increasingly rational or less so.

Environmental hostility-munificence

Environmental munificence is an important environmental attribute that refers to the ability of the environment to support the business of firms (Dess & Beard, 1984). There is increasing interest in the relationship between environmental munificence/hostility and strategic decision processes. Mitchell et al. (2011) found that in hostile environments, decision-makers with wide metacognitive experience are less consistent in their decision-making. Several studies show that environmental munificence/hostility acts to limit the effects of strategic decision processes on organizational outcomes (Elbanna & Child, 2007a; Elbanna et al., 2013; Goll & Rasheed, 1997). Other studies found a significant effect of environmental hostility and both analysis (Miller & Friesen, 1983) and conflict (Elbanna, 2009). Given that Papadakis et al. (1998) reported that hostility and strategic decision processes are not directly related, it becomes clear that the evidence on the role of environmental hostility/munificence is not generalizable. As discussed in the environmental uncertainty section, the conflicting results are most probably due to many methodological features and substantive differences (see Boyd et al., 2013). In conclusion, environmental characteristics display mixed results.

The organizational characteristics perspective

A variety of organizational factors influences the strategic decision process, which in turn leads to organizational outcomes. Alternatively, some authors investigate the moderating effects of such factors on the linkage between strategic decision processes and decision outcomes. This study reviews three organizational variables that have been widely considered in prior studies. These are organizational performance, company size, and type of ownership.

Organizational performance

The literature on strategic decision processes reports inconsistent findings on the nature of the relationship between past firm performance and rationality in strategic decision processes. For example, Amason and Mooney (2008) concluded that poor past performance will increase the comprehensiveness of strategic decision processes. The opposite finding has been reported by other researchers (e.g., Papadakis et al., 1998). Elbanna et al. (2013) found that past performance and intuition are not related. Elbanna, Thanos, and Colak (2015c) and Francioni et al. (2015) found a positive relationship between past performance and the quality of decision implementation and rationality. Ashmos et al. (1998) reported the influence of past performance on participation in the strategic decision process. Of interest is that different aspects of performance may influence differently the strategic decision process dimensions (for more information, see Elbanna & Naguib, 2009; Elbanna, Thanos, & Papadakis, 2014).

Another strand of this research examines the impact of strategic decision processes on different organizational outcomes such as decision effectiveness (e.g., Jansen et al., 2011; Ji & Dimitratos, 2013; Nooraie, 2008), speed (e.g., Amason & Mooney, 2008), commitment (e.g., Parayitam & Dooley, 2009), creativity (e.g., Dayan & Di Benedetto, 2011; Ford, Sharfman, & Dean, 2008), and firm performance (e.g., Baum & Wally, 2003; Dimitratos, Thanos, Petrou, & Papadakis, 2011b; Miller, 2008; Mueller et al., 2007; Simons, Pelled, & Smith, 1999).

Unfortunately, none of the studies above opted for a longitudinal/panel-type approach, such that performance as outcome could also function as an antecedent of the strategic decision process. Although the studies reviewed so far examine the relationship between strategic decision processes and performance, performance may moderate the effects of strategic decision processes on outcomes. Only one study has examined this critical issue, namely Elbanna and Child (2007a). Clearly, we need more of such studies. Adjacent areas that focus on aspiration levels and performance feedback thinking may provide inspiration looking at the role of previous organizational performance, since these studies build explicitly on the behavioral theory of the firm and focus on adaptive decision behavior (Gavetti, Greve, Levinthal, & Ocasio, 2012).

Company size

Although its importance has long been recognized, the findings regarding the relationship between company size and strategic decision processes are mixed. A line of research argues that the size of an organization has a profound impact on its strategic decision processes. For instance, Fiegener (2005) found that the company's size encourages the board to take part in its strategic decision process. Elbanna et al. (2013) reported that large firms follow less intuitive decision processes. Brouthers et al. (1998) argued that managers in small firms use intuitive rather than rational strategic decision processes, while, according to Fredrickson and Iaquinto (1989) and Elbanna (2010), in large firms, executives rely on rational/comprehensive approaches. It was also found that size negatively affects agreement in the top management team (Iaquinto & Fredrickson, 1997). On a related note, Duhaime and Baird (1987) argued that managers of larger firms exhibit lower levels of involvement than managers of small firms. Interestingly, though, Dean and Sharfman (1993a) have not found any relationship between firm size and strategic decision processes.

Similar inconsistent findings have also been reported as far as the moderating impact of size is concerned on the effects of strategic decision processes on decision performance. All these inconsistent findings could be attributed to differences in the research methods and measures adopted in studies and call for more research on the topic.

Type of ownership (corporate control)

Some studies investigate the relationship between strategic decision processes and the type of ownership or corporate control. Papadakis et al. (1998), for example, reported a significant influence of the type of control on several aspects of the strategic decision process. Elbanna (2012) contended that more researchers should investigate the critical role of type of ownership in shaping strategic decision processes in both public and private organizations. The available evidence seems to suggest major differences between the dimensions of decision processes in public and private organizations, but more empirical evidence is unquestionably needed to reach robust and generalizable conclusions.

Other studies

Two additional topics emerged in our analysis of the strategic decision process literature. These are strategic performance measurement (systems) and strategic control. The latter, strategic control refers to the alignment of managers' performance with the organization's key objectives. In this regard, Elbanna (2016) found that if strategic control was higher, less political behavior was encountered or displayed. The former,

strategic performance measurement (systems) refers to sets of metrics that track the performance of an organization in different areas, that is, they "present distinctive features such as: (1) the integration of long-term strategy and operational goals; (2) the provision of performance measures in the area of multiple perspectives; (3) the provision of a sequence of goals/metrics/targets/action plans for each perspective; and (4) the presence of explicit causal relationships between goals and/or between performance measures" (Bisbe & Malagueño, 2012, p. 297). Bisbe and Malagueño showed that organizational performance benefits from the use of this system. Abdel-Maksoud, Elbanna, Mahama, and Pollanen (2015) and Pollanen, Abdel-Maksoud, Elbanna, and Mahama (2017) found that the use of performance information increases and benefits organizational performance, but different types of metrics and decisions are effective in different ways. Metrics of efficiency contribute through their use of information to both decisions on strategy implementation and evaluations of strategy, but metrics of effectiveness do not. These measurement systems can encapsulate past performance and they can also cover substantially more aspects of an organization's performance.

Patterns across contextual characteristics

In this section, we report on two patterns that surfaced in our analysis. These patterns highlight some of the longstanding discussions in the research on the strategic decision process that have not been tackled satisfactorily and are as yet contradictory.

The first pattern focuses on what process means and as such describes some of the epistemological assumptions hitherto adopted by strategic decision process studies. From the reviewed papers, it became clear that certain meanings of process are represented more than others. Van de Ven (1992) described three meanings of the word process that offer guidance for research designs on strategic decision processes (Szulanski, Porac, & Doz, 2005): "(I) a logic that explains a causal relationship between independent and dependent variables, (II) a category of concepts or variables that refers to actions of individuals or organizations, and (III) a sequence of events that describes how things change over time."

Whittington (2016) described process meaning (I) as extracting strategy processes from organizations and treating them as essentially inanimate things in which the complexities of the process become tractable by rubbing out the sequences that link the event and subsequent outcome; a process story or logic is used in such studies to explain why an independent (input) variable exerts a causal influence on a dependent (outcome) variable (Van de Ven, 1992).

Process meaning (II) focuses on strategy processes as discrete processes, infuses them with life and dynamism, and emphasizes their dynamics (Whittington, 2016). Usually, these studies capture process in concepts that are operationalized as constructs and measured as fixed entities (variables) (Pettigrew, 1992; Van de Ven, 1992). While these studies capture the temporal aspects of strategic decision processes better than those under process meaning (I) by tracing the sequence of events across (long) periods of time (Pettigrew, 1992), their capacity to do so is limited by focusing on attributes of strategic decision processes which can vary along numerical scales from low to high. Process meaning (III) explicitly and directly observes processes in action and thereby can describe and account for the way in which some entity or issue develops and changes over time. It is this third view of process meaning that takes a historical developmental perspective and thereby focuses on "the sequences of incidents, activities, and actions unfolding over time" (Pettigrew, 1992, p. 7). The focus lies on the sequences of incidents, activities, and stages that unfold over the duration of a central subject's existence (Van de Ven, 1992). It is this third meaning of process that is usually considered as capturing process in the fullest way, because it captures "reality in flight" and outcomes are attributed a meaning, which is not the same as the first two meanings convey (Langley, 2007; Van de Ven, 1992). Rather than having the status of 'final outcomes,' these first two meanings can be considered inputs to ongoing processes, since their evaluations and interpretations can have important effects on subsequent actions (Langley, 2007; Langley & Abdallah, 2011).

Distinguishing between process meanings allows scholars to better understand the conceptual basis of the reviewed research and when taken together these meanings help us to identify promising directions in the strategic decision process research. Process studies generally address questions about *how* and *why* things emerge, develop, grow, or terminate over time (Langley, Smallman, Tsoukas, & Van de Ven, 2013). Hence, it was surprising to find relatively few studies that used an elaborate form of processual analysis (process meaning III) to explain the links between context, process and outcomes (Langley, 2007; Pettigrew, 1997; Whittington, 2016). The number of papers across the three process meanings is rather skewed, with process meaning (I) represented in 26 studies (29.9%), process meaning (II) represented in 52 studies (59.8%), and process meaning (III) represented in 9 studies (10.3%). Although the type of research demands much in the way of resources and time, it would provide a more close and accurate understanding of the temporal evolution of things or substances in strategic decision processes if more studies viewed strategic decision processes from the perspective of process meaning (III) (Langley & Tsoukas, 2016).

The implication of this first pattern is that the knowledge derived from studies on strategic decision processes may inform practitioners about relevant input, throughput, and

output aspects of the strategic decision process in a discrete sense (process meanings I and II). However, it is less capable of teaching them how to act or guiding them in improving their performance (Langley, 2007), and they will learn little from it about the links between the actions that lead to the formulation and support of strategic processes and decisions in their context and in relation to the intended and unintended outcomes, that is, how things move along in the strategic decision process (Huff & Reger, 1987; Pettigrew, 1997; Whittington, 2016). It is ultimately the ordering of the process and the agents involved in it (the organization and the strategy-makers), the issue to be decided on, and the sequence of actions that leads to decisions and drives them along (Hutzschenreuter & Kleindienst, 2006). The spatial and temporal ordering and arrangement of these elements during the strategic decision process gets us close to the way that strategic decisions actually happen. Such an approach may help to overcome the limitations traditionally associated with research that resembles process meanings (I) and (II), that is, reification when research moves too far from the actual strategic decision process; dehumanization when agency and what agents do in the strategic decision process are downplayed; and isolation of the strategic decision process as a discrete process from the wider strategy or organizational processes (Langley, Mintzberg, Pitcher, Posada, & Saint-Macary, 1995). Still, this should not be seen as a plea to focus only on the particularly elaborate process meaning (III) when researching the effect of context on strategic decision processes. Rather, the deep insights derived from this process meaning can be productively used to complement the more widely available knowledge derived from studies of process meanings (I) and (II).

The second pattern focuses on the research design, data collection methods, measurement strategies, and sampling procedures used by studies for analyzing the process meanings presented above. With respect to the research design, the first bias refers to the adoption of cross-sectional research designs by most of the studies grouped in all process meanings and the shortage of longitudinal studies. While there is generally nothing wrong with using cross-sectional data in principle, their use should be avoided in studies that aim to identify causality or change, which is the case for process meanings (I) and (II). In other words, the coherence between the research question and research design can be further improved in research on strategic decision processes. With respect to data collection methods we noticed a second bias. The overwhelming majority of reviewed studies follow a deductive approach emphasizing a quantitative research design. We were able to list only a few qualitative papers (e.g., Calabretta, Gemser, & Wijnberg, 2017; Eisenhardt, 1989; Langley, 1989; Mintzberg et al., 1976). We view this lack of balance as a little problematic because qualitative studies allow for an in-depth understanding of the way in which context shapes process over time, yielding useful implications for managers and policy-makers (Eisenhardt, 1989; Langley et al., 1995).

As a third bias, with respect to measurement strategies, we noticed in the quantitative studies that the strategic decision process is full of inconsistencies in terms of labeling, defining, and measuring key constructs. This is not new in the strategic decision process area and has been highlighted by prior literature reviews as a substantive priority for future studies to remedy (Elbanna, 2006; Forbes, 2007; Papadakis et al., 2010). The most popular example is that of rationality, which has been labeled as procedural rationality, analysis, and comprehensiveness and has been measured with the use of several different scales. This situation is also found in other dimensions of the strategic decision process such as politics (often labeled "politicization" or "political behavior" and measured with different scales) and intuition or intuitive synthesis. The use of different labels and measures of the same construct may lead to different empirical findings and reduce the chance of conducting meta-analyses. We view the latter as a notable limitation of the field, given that meta-analyses allow cumulative knowledge to be amassed (Samba, Tabesh, Thanos, & Papadakis, in press). With respect to sample selection, we noticed as a fourth bias that research on strategic decision processes has mainly taken place in the United States, mostly emphasizing manufacturing firms. Several studies have argued that the results of these studies may not be generalizable to other national or industry settings (e.g., service industries) and have called for more research to investigate the effects of national culture on strategic decision processes (e.g., Cardinal, Miller, Kreutzer, & Tenbrink, 2015; Elbanna, 2006).

Evidently, much more research is needed before we have an adequate understanding of the impact of national culture on the strategic decision process. The best way to do this is through research in other countries than the USA and cross-cultural studies in several national settings. We were able to identify several recent papers relying on non-US data. For example, we were delighted to see that in recent years, researchers have used samples of British (e.g., Thomas & Ambrosini, 2015), Irish (e.g., Heavey, Simsek, Roche, & Kelly, 2009), Italian (e.g., Francioni et al., 2015), Greek (e.g., Thanos, Dimitratos, & Sapouna, 2017), German (e.g., Meissner & Wulf, 2014), Dutch (e.g., Jansen et al., 2013), Egyptian (e.g., Elbanna & Child, 2007a), United Arab Emirates (e.g., Elbanna & Fadol, 2016b), Turkish (e.g., Elbanna et al., 2015c), and Malaysian (e.g., Nooraie, 2008) firms. Only a few scholars have relied on cross-national samples (see, e.g., the study by Dimitratos, Petrou, Plakoyiannaki, & Johnson, 2011a). Still, most strategic decision process studies continue to focus on manufacturing at the expense of service firms.

Theoretical and practical implications

Based on the preceding review of empirical research on strategic decision processes, several implications for theory and practice can be identified. These types of implication will be discussed in turn.

Theoretical implications

First, our review leads us to conclude that some patterns across contextual perspectives can be observed. Notably, two patterns have been identified which help to explain why mixed or conflicting findings persist. The first pattern, describing the extent to which different meanings are attached to process in the sense of "strategic decision process," shows that there is a skewed distribution between the three types distinguished by Van de Ven (1992), with a de-emphasis on the process meaning that approximates most closely to a pure process approach to studying strategic decision processes. In addition, these variations between process meanings appearing within an individual contextual perspective propagate mixed findings, due to the inconsistent focus of studies on different process meanings, while claiming that they add to the same aspects and meaning of process. The second pattern describes the extent of bias in several aspects of the research set-up and methodology. This bias illustrates the variety of approaches and methodologies to study the same phenomenon or relationship, here the strategic decision process and its relationship with contextual perspectives. Since this appears from an individual contextual perspective, it propagates mixed findings due to the inconsistent focus of studies on the constructs and other aspects of the research set-up and methodology, as is observed in several areas of strategic management (Boyd et al., 2013; Ketchen, Boyd, & Bergh, 2008). This in turn leads to more scattered than connected insights. In combination, these patterns give us strong indications why mixed findings persist in the research on strategic decision processes.

Second, when the strategic decision process research includes multiple contextual perspectives, these often play different roles. For example, organizational characteristics, if not used as antecedents of the strategic decision process, are often used as control variables next to top management characteristics, which are used as antecedents. Similarly, environmental characteristics are often used as moderating variables in the process–outcomes relationship. Our analysis of the literature thus shows that influences derived from multiple contextual perspectives are used jointly in this research field. However, given the inconsistency in addressing the role of different contexts, in terms of the types and number of perspectives considered, we can only contribute some ways of regulating research. It is impossible at this stage to provide a fully integrated picture of why strategic decision process studies are inconsistent with each other.

Third, as discussed below, this review led us to identify four compelling directions for future research and three further avenues of interest. It highlights the inference that part of the research agenda on this topic, as stated in previous reviews and empirical articles, is still unfulfilled. Some progress has been made in the four compelling areas, but not so much as to claim that we have solved the largest part of the puzzle they present. The further avenues of interest indicate that it is time for research on strategic decision processes both to "borrow concepts" from adjacent strategic management fields and to let others "borrow concepts" more recognizably from the existing research on strategic decision processes. In this regard, the research on entrepreneurial decision-making, while encouraging in its present growth, hardly connects directly to research on strategic decision processes. With respect to borrowing concepts from adjacent fields of strategic management, comparing direct measurements with archival measurements requires bridges with, for example, interactional approaches to strategy and behavioral and micro-foundations approaches, which focus on applying cognitive and social psychology. In other words, next to the field-specific agenda, our review also shows that researchers should interact across the boundaries of the field.

Practical implications

Two specific practical implications follow from this review, namely (1) the presence of multiple influences and (2) the need to consider the links between contextual perspectives and their different roles. Both implications are discussed below.

First, practitioners are well aware of the complexity and uncertainty that surround strategic decisions and strategic decision processes. Hence, they are aware of the presence of multiple influences that need their attention. This set may not be the same set of influences for every strategic decision process. Moreover, given the scarcity of integrative studies of the effect of context on the strategic decision process, practitioners should be wary of relying on studies that present a narrow view of the context of strategic decision processes. The present review did not designate any 'most important' or 'most salient' influence. Studies that incorporate influences on the strategic decision process from a single or limited set of contextual perspectives and only a single dimension of the strategic decision process can thus be considered too narrow to rely on, unless the empirical setting is very similar to the one that the practitioner has. Since this is rarely the case, however, we would ask practitioners to weigh such studies carefully and rely on more broad and integrative studies of influences on the strategic decision process. We would also recommend them to consider studies where at least three out of four possible contextual perspectives and at least two or more dimensions of the strategic decision process are taken into account as

influences, to reduce the chance of testing influences in too much isolation. Avoiding the use of narrow studies is likely to help prevent decision failures or errors by having the potential for counterbalancing effects (as we can see from the mixed findings of context on the strategic decision process).

Second, practitioners should take heed of 'links between contextual perspectives and their different roles.' In this review, we made a point of the spatial and temporal ordering of the elements in the unfolding of the strategic decision process. Contextual perspectives and the influences from various perspectives do not drive the entire strategic decision process for its full duration. Most quantitative research takes little or no account of where in the process (spatial aspect), or of when and how continuously in the process (temporal aspect) contextual perspectives and influences become active and impinge on the strategic decision process. We recommend practitioners to repeatedly pose the question *why* certain perspectives and influences should be considered during the strategic decision process, and to place them on the timeline of the process and conceive of the links between these influences for any specific strategic decision process. In other words, next to relying on the evidence in terms of effects and their sizes, part of the analysis should cover the mechanisms or more qualitative background narratives on where, when, and how influences impinge on the strategic decision process.

Recommendations for future research

Based on our in-depth review of the literature, we have identified seven directions for future research as discussed below.

First, future studies should consider the examination of more complex relationships (e.g., two- and three-way interactions, mediation, and curvilinear) than simply the main effects of constructs from the four perspectives on strategic decision processes. Our literature review indicates that most studies in the area test for the main or direct effects of the four different perspectives on strategic decision processes. However, the case may be that the variables within the same perspective interact and this interaction deserves further theoretical and empirical investigation. Similarly, it could be argued that the interaction between the four perspectives could add to the explained percentage of variance in the dependent variable over and above their direct effects. In the only exception in the literature that is looking for such relationships, Brouthers, Brouthers, and Werner (2000) in a Dutch setting show that managerial characteristics such as age, education and risk propensity limit the influence of external factors (i.e., turbulence) and internal ones (i.e., structure, entrepreneurial style) on strategic aggressiveness. Similar interaction effects may be relevant in explaining other strategic decision processes, such as comprehensiveness, political behavior, and intuition (Elbanna et al., 2014). Given the suggestion in the upper echelon theory (Finkelstein et al., 2009) and the related literature that the demographic and psychological characteristics of top managers may limit the influence of external and internal factors on the strategic decision processes by restricting information search and retrieval activities, we argue that it is time to test for such effects with empirical data.

On a related note, researchers should test for the possibility of mediation effects among the four perspectives. For example, organization and decision characteristics may mediate the effects of environmental factors on strategic decision processes. More specifically, it could be argued that environmental uncertainty and hostility damage company performance (see Baum & Wally, 2003 for more on this). If they do, then company performance fully mediates the relationship between environmental uncertainty, hostility, and strategic decision processes. Similarly, it could be argued that environmental uncertainty and hostility increase decision uncertainty; if so, then decision uncertainty fully mediates the relationship between uncertainty, hostility, and comprehensiveness. The latter result suggests that the effect of environmental factors may be filtered through the characteristics of the decision (the decision-specific factors), as well. Thus, there is a need to investigate the empirical data on such possible mediating mechanisms.

Second, there is a need to use more overarching, latent constructs to capture the personality of a CEO and of the top managers. Hitherto, all studies in the strategic decision process area have examined individual aspects of the CEO's personality. These studies, although important, have not considered multiple personality characteristics together and, most importantly, have not investigated their possible interrelationships and overlaps with each other (Judge, Erez, Bono, & Thoresen, 2003). Recent developments in the strategy and organizational behavior literature suggest that characteristics such as core-self-evaluation, hubris and the five-factor model deserve further theoretical and empirical attention (Hiller & Hambrick, 2005; Nadkarni & Herrmann, 2010). To the best of our knowledge, such constructs have not been studied in the context of strategic decision processes.

Third, apart from a few exceptions (e.g., Hickson, Miller, & Wilson, 2003; Nutt, 2008) previous studies adopt a cross-sectional research design. The adoption of such a design limits the ability of researchers to establish causal connections among constructs. Thus, we would welcome studies investigating the context and processes over time (i.e., longitudinal studies). Also, research on strategic decision processes ought to expand beyond the geographic and cultural foci of the United States and include a wider range of organizations than manufacturing firms alone.

Fourth, most of the empirical papers that we reviewed focus on the effects of context on either the formulation or the implementation of a strategic decision. In other words, formulation and implementation are viewed as two distinct

and independent stages of the strategic decision process. This is not in line with the tenets of the strategy process literature which have long recognized the need to investigate both how decisions are formulated and implemented and how implementation then affects the formulation of subsequent decisions (Elbanna, 2015; Hutzschenreuter & Kleindienst, 2006). We view this as a notable limitation in the available studies. Future scholars should investigate how formulation and implementation stages are related to each other and unfold over time and how the context shapes this relationship. Answers to such research questions can be provided by adopting longitudinal research designs. What is more, previous studies have mainly theorized and tested a linear sequence from context to formulation, implementation, and outcomes. This sequence is rather static and ignores the dynamic nature of our world. For example, conventional wisdom would suggest that managers consider the outcomes of their decisions when making and implementing new ones. It would also suggest that the experience gained from implementing past strategic decisions will influence the way in which new ones are made and implemented. In Figure 1, this can be depicted by adding an arrow from implementation to formulation and from outcomes to process. Such relationships, however, have not been tested with empirical data and again require a longitudinal research design.

Fifth, most of the studies from the top management perspective that we reviewed focus on the demographic diversity of the top managers and make inferences about their cognitive diversity (e.g., Elbanna et al., 2017), because the former can be easily measured on the basis of archival data while the latter requires demanding field research. In a broader sense, this is consistent with the general trend that has been observed over the years in the upper-echelon literature according to which researchers measure demographic characteristics and use them as proxies of psychological ones (Finkelstein et al., 2009). Recent empirical evidence suggests that such practices can lead to biased conclusions, given that demographic characteristics may not be a proxy of psychological characteristics (for a thorough critique, see Lawrence, 1997). In view of the empirical evidence demonstrating how important psychological characteristics such as cognitive diversity are (Miller, Burke, & Glick, 1998; Samba, Van Knippenberg, & Miller, 2018), we encourage studies that directly measure psychological characteristics.

Sixth, we believe that future scholars can borrow constructs and ideas from the strategic decision process area and apply them in relevant fields of research, such as the internationalization processes of SMEs, new product development, mergers and acquisitions, strategic alliances, and divestitures. In the recent past, we have seen preliminary efforts in these areas (as an example, see Elbanna, Hsieh, & Child, 2015b). For instance, Dimitratos et al. (2011a) investigated the relationship between performance and three loci of internationalization decision processes (i.e., formalization, decentralization, and lateral communication) in the international marketplace of SMEs. They found that the first two processes are positively related to performance but the last is not. Slotegraaf and Atuahene-Gima (2011) examined the antecedents and outcomes of marketing strategy comprehensiveness. Other studies have argued that comprehensiveness is positively related to allocating capital efficiently (Strauch, Pidun, & Zu Knyphausen-Aufseß, 2019) and divestiture outcomes (Thywissen, Pidun, & Zu Knyphausen-Aufsess, 2018). In the area of strategic alliances, Walter, Kellermans, and Lechner (2012) argued that rationality in alliance decision processes positively influences alliance performance. More recently, Kaufmann, Meschnig, and Reimann (2014) have studied the effects of rationality and intuition on the success of supplier decisions. Such cross-disciplinary research could yield interesting theoretical and practical implications and for this reason is much to be welcomed.

On a related note, some studies (Heavey et al., 2009; Thanos et al., 2017) link the dimensions of strategic decision processes with well-known constructs from the entrepreneurship literature such as (international) entrepreneurial orientation, which refers to the tendency of a firm to be proactive, innovative, and risk taking (Wales, 2016). Such research efforts are very useful and welcome, because they help to refine what is known in other streams of the literature and make notable contributions to our level of knowledge. Similarly, although managers use information systems when making decisions, empirical research on the impact of these systems on strategic decision processes and their outcomes is limited. This is rather surprising that previous literature reviews have explicitly called for more research on this topic (e.g., Papadakis et al., 2010), and hence, we view it as an interesting research opportunity.

As a seventh possible direction for future research, we believe that a next step in the relevant area would be to develop a review synthesis that comprehensively captures and maps the literature on strategic decisions. The systematic review undertaken here brought together many works on the contextual factors, but its focus forbade the inclusion of papers on strategic decisions unless they included contextual factors or were empirical. Papers considered pivotal to the field of studying strategic decisions, such as the work of Mintzberg et al. (1976) on the incremental decision process model and the work of Dean and Sharfman (1993b) on the independence of dimensions of the strategic decision process were, thus excluded. Such papers are also foundational to the field and critical for a full understanding of strategic decision-making. An integration of all the relevant empirical works (rather than the subset of work reviewed here) could by means of meta-analysis based on a thorough consideration of the foundational and core literature of the field help to overcome the previously mentioned limitations of construct and measurement diversity.

The literature would then reach a more comprehensive and meaningful synthesis which would serve as a starting point for scholars interested in the field. On a related note, a more modest first step in such an undertaking could be a review-of-reviews in the field. There have been several review papers that can be considered to have built on one another, such as the work by Huff and Reger (1987), Rajagopalan et al. (1993), Schwenk (1995), Rajagopalan et al. (1997), Hutzschenreuter and Kleindienst (2006), Elbanna (2006), Papadakis et al. (2010), Shepherd and Rudd (2014), and Bromiley and Rau (2016). These have not so far been explicitly explored in relation to one another. Although this list is far from complete, a review-of-reviews in combination with the foundational and core literature of the field could provide a careful narrative of the build-up and development of the strategic decision-making field based on its contents and main perspectives. This research direction shows that there is still vast potential to deliver a more comprehensive synthesis of the field, based on the integration of individual empirical papers against a carefully developed background. Both suggestions discussed above would add to the existing literature by functioning as a point for engaging in the academic conversation on strategic decision-making.

In conclusion, this article provided an in-depth review on the role of the broader context in strategic decision processes and, in order to get more insight into this role, identified several future research opportunities for theorists and practitioners alike.

Acknowledgements

The authors would like to thank Thomas Roulet and three anonymous reviewers for their invaluable feedback on earlier drafts of this article.

References[1]

*Abdel-Maksoud, A., Elbanna, S., Mahama, H. & Pollanen, R. (2015). The use of performance information in strategic decision making in public organizations. *International Journal of Public Sector Management*, *28*(7), 528–549. doi: 10.1108/IJPSM-06-2015-0114

*Alkaraan, F. & Northcott, D. (2006). Strategic capital investment decision-making: A role for emergent analysis tools? A study of practice in large UK manufacturing companies. *British Accounting Review*, *38*(2), 149–173. doi: 10.1016/j.bar.2005.10.003

*Amason, A. C. (1996). Distinguishing the effects of functional and dysfunctional conflict on strategic decision making: Resolving a paradox for top management teams. *Academy of Management Journal*, *39*(1), 123–148. doi: 10.2307/256633

Amason, A. C. & Mooney, A. C. (2008). The Icarus paradox revisited: How strong performance sows the seeds of dysfunction in future strategic decision-making. *Strategic Organization*, *6*(4), 407–434. doi: 10.1177/1476127008096364

*Ashmos, D. P., Duchon, D. & McDaniel, R. R. (1998). Participation in strategic decision making: The role of organizational predisposition and issue interpretation. *Decision Sciences*, *29*(1), 25–51. doi: 10.1111/j.1540-5915.1998.tb01343.x

*Ashmos, D. P. & McDaniel, R. R. (1996). Understanding the participation of critical task specialists in strategic decision making. *Decision Sciences*, *27*(1), 103–121. doi: 10.1111/j.1540-5915.1996.tb00845.x

Asmuß, B. & Oshima, S. (2018). Strategy making as a communicative practice: the multimodal accomplishment of strategy roles. *M@n@gement*, *21*(2), 884–912. doi: 10.3917/mana.212.0884

*Atuahene-Gima, K. & Li, H. Y. (2004). Strategic decision comprehensiveness and new product development outcomes in new technology ventures. *Academy of Management Journal*, *47*(4), 583–597. doi: 10.5465/20159603

*Bailey, B. C. & Peck, S. I. (2013). Boardroom strategic decision-making style: Understanding the antecedents. *Corporate Governance: An International Review*, *21*(2), 131–146. doi: 10.1111/corg.12008

*Bantel, K. A. (1993). Top team, environment, and performance effects on strategic-planning formality. *Group & Organization Management*, *18*(4), 436–458. doi: 10.1177/1059601193184004

*Baum, J. R. & Wally, S. (2003). Strategic decision speed and firm performance. *Strategic Management Journal*, *24*(11), 1107–1129. doi: 10.1002/smj.343

*Bisbe, J. & Malagueño, R. (2012). Using strategic performance measurement systems for strategy formulation: Does it work in dynamic environments? *Management Accounting Research*, *23*(4), 296–311. doi: 10.1016/j.mar.2012.05.002

Boone, C., De Brabander, B. & van Witteloostuijn, A. (1996). CEO locus of control and small firm performance: An integrative framework and empirical test. *Journal of Management Studies*, *33*(5), 667–699. doi: 10.1111/j.1467-6486.1996.tb00814.x

*Bourgeois, L. J. & Eisenhardt, K. M. (1988). Strategic decision-processes in high-velocity environments: Four cases in the microcomputer industry. *Management Science*, *34*(7), 816–835. doi: 10.1287/mnsc.34.7.816

Boyd, B. K., Bergh, D. D., Ireland, R. D. & Ketchen, D. J. (2013). Constructs in strategic management. *Organizational Research Methods*, *16*(1), 3–14. doi: 10.1177/1094428112471298

Le Bris, S., Madrid-Guijarro, A. & Martin, D. P. (2019). Decision-making in complex environments under time pressure and risk of critical irreversibility: The role of meta rules. *M@n@gement*, *22*(1), 1–29. doi: 10.3917/mana.221.0001

Bromiley, P. & Rau, D. (2016). Social, behavioral, and cognitive influences on upper echelons during strategy process: A literature review. *Journal of Management*, *42*(1), 174–202. doi: 10.1177/0149206315617240

*Brouthers, K. D., Andriessen, F. & Nicolaes, I. (1998). Driving blind: Strategic decision-making in small companies. *Long Range Planning*, *31*(1), 130–138. doi: 10.1016/S0024-6301(97)00099-X

Brouthers, K. D., Brouthers, L. E. & Werner, S. (2000). Influences on strategic decision-making in the Dutch financial services industry. *Journal of Management*, *26*(5), 863–883. doi: 10.1016/S0149-2063(00)00061-1

Butler, R. (2002). Decision making. In A. Sorge (Ed.), *Organization* (pp. 224–251). London: Thomson Learning.

Calabretta, G., Gemser, G. & Wijnberg, N. M. (2017). The interplay between intuition and rationality in strategic decision making: A paradox perspective. *Organization Studies*, *38*(3–4), 365–401. doi: 10.1177/0170840616655483

Cardinal, L. B., Miller, C. C., Kreutzer, M. W. & Tenbrink, C. (2015). Strategic planning and firm performance: Towards a better understanding of

[1] Asterisks denote studies resulted from the systematic literature review

a controversial relationship. In M. D. Mumford & M. Frese (Eds.), *The psychology of planning in organizations: Research and applications* (pp. 260–288). New York, NY: Routledge.

*Carmeli, A., Tishler, A. & Edmondson, A. C. (2012). CEO relational leadership and strategic decision quality in top management teams: The role of team trust and learning from failure. *Strategic Organization*, *10*(1), 31–54. doi: 10.1177/1476127011434797

*Cheng, V., Rhodes, J. & Lok, P. (2010). A framework for strategic decision making and performance among Chinese managers. *International Journal of Human Resource Management*, *21*(9), 1373–1395. doi: 10.1080/09585192.2010.488434

Child, J. (1997). Strategic choice in the analysis of action, structure, organizations and evironment: Retrospect and prospect. *Organization Studies*, *18*(1), 43–76. doi: 10.1177/017084069701800104

Child, J., Elbanna, S. & Rodrigues, S. (2010). The political aspects of strategic decision making. In P. C. Nutt & D. C. Wilson (Eds.), *Handbook of decision making* (pp. 105–137). Chichester: Wiley.

*Clark, K. D. & Maggitti, P. G. (2012). TMT potency and strategic decision-making in high technology firms. *Journal of Management Studies*, *49*(7), 1168–1193. doi: 10.1111/j.1467-6486.2012.01060.x

*Covin, J. G., Slevin, D. P. & Heeley, M. B. (2001). Strategic decision making in an intuitive vs. technocratic mode: Structural and environmental considerations. *Journal of Business Research*, *52*(1), 51–67. doi: 10.1016/S0148-2963(99)00080-6

*Dayan, M. & Di Benedetto, C. A. (2011). Team intuition as a continuum construct and new product creativity: The role of environmental turbulence, team experience, and stress. *Research Policy*, *40*(2), 276–286. doi: 10.1016/j.respol.2010.10.002

*Dayan, M., Elbanna, S. & Di Benedetto, A. (2012). Antecedents and consequences of political behavior in new product development teams. *IEEE Transactions on Engineering Management*, *59*(3), 470–482. doi: 10.1109/TEM.2011.2166078

*Dean, J. W. & Sharfman, M. P. (1993a). Procedural rationality in the strategic decision-making process. *Journal of Management Studies*, *30*(4), 587–610. doi: 10.1111/j.1467-6486.1993.tb00317.x

Dean, J. W. & Sharfman, M. P. (1993b). The relationship between procedural rationality and political behavior in strategic decision-making. *Decision Sciences*, *24*(6), 1069–1083. doi: 10.1111/j.1540-5915.1993.tb00504.x

*Dean, J. W. & Sharfman, M. P. (1996). Does decision process matter? A study of strategic decision making effectiveness. *Academy of Management Journal*, *39*(2), 368–396. doi: 10.2307/256784

*Denis, J.-L. L., Dompierre, G., Langley, A. & Rouleau, L. (2011). Escalating indecision: Between reification and strategic ambiguity. *Organization Science*, *22*(1), 225–244. doi: 10.1287/orsc.1090.0501

Dess, G. G. & Beard, D. W. (1984). Dimensions of organizational task environments. *Administrative Science Quarterly*, *29*(1), 52–73. doi: 10.2307/2393080

*Dimitratos, P., Petrou, A., Plakoyiannaki, E. & Johnson, J. E. (2011a). Strategic decision-making processes in internationalization: Does national culture of the focal firm matter? *Journal of World Business*, *46*(2), 194–204. doi: 10.1016/j.jwb.2010.05.002

*Duhaime, I. M. & Baird, I. S. (1987). Divestment decision-making: The role of business unit size. *Journal of Management*, *13*(3), 483–498. doi: 10.1177/014920638701300305

*Dutton, J. E. & Duncan, R. B. (1987). The creation of momentum for change through the process of strategic issue diagnosis. *Strategic Management Journal*, *8*(3), 279–295. doi: 10.1002/smj.4250080306

Eisenhardt, K. M. (1989). Making fast strategic decision in high velocity environments. *Academy of Management Journal*, 32(3), 543–576. doi.10.5465/256434

Eisenhardt, K. M. & Zbaracki, M. J. (1992). Strategic decision making. *Strategic Management Journal*, *13*(SI), 17–37. doi: 10.1002/smj.4250130904

Elbanna, S. (2006). Strategic decision-making: Process perspectives. *International Journal of Management Reviews*, *8*(1), 1–20. doi: 10.1111/j.1468-2370.2006.00118.x

Elbanna, S. (2009). The impact of affective conflict on firm performance. *Management Research News*, *32*(9), 789–803. doi: 10.1108/01409170910980317

Elbanna, S. (2010). *Making strategic decisions: A state of the art review and empirical evidence from a cultural perspective*. Dudweiler Landstr: Lambert Academic Publishing.

*Elbanna, S. (2012). Slack, planning and organizational performance: Evidence from the Arab middle east. *European Management Review*, *9*(2), 99–115. doi: 10.1111/j.1740-4762.2012.01028.x

Elbanna, S. (2015). Intuition in project management and missing links: Analyzing the predicating effects of environment and the mediating role of reflexivity. *International Journal of Project Management*, *33*(6), 1236–1248. doi: 10.1016/j.ijproman.2015.02.004

*Elbanna, S. (2016). Managers' autonomy, strategic control, organizational politics and strategic planning effectiveness: An empirical investigation into missing links in the hotel sector. *Tourism Management*, *52*, 210–220. doi: 10.1016/j.tourman.2015.06.025

*Elbanna, S. (2018). The constructive aspect of political behavior in strategic decision-making: The role of diversity. *European Management Journal*, *36*(5), 616–626. doi: 10.1016/j.emj.2018.06.006

*Elbanna, S., Ali, A. J. & Dayan, M. (2011). Conflict in strategic decision making: Do the setting and environment matter? *International Journal of Conflict Management*, *22*(3), 278–299. doi: 10.1108/10444061111152973

*Elbanna, S. & Child, J. (2007a). Influences on strategic decision effectiveness: Development and test of an integrative model. *Strategic Management Journal*, *28*(4), 431–453. doi: 10.1002/smj.597

*Elbanna, S. & Child, J. (2007b). The influence of decision, environmental and firm characteristics on the rationality of strategic decision-making. *Journal of Management Studies*, *44*(4), 561–591. doi: 10.1111/j.1467-6486.2006.00670.x

*Elbanna, S., Child, J. & Dayan, M. (2013). A model of antecedents and consequences of intuition in strategic decision-making: Evidence from Egypt. *Long Range Planning*, *46*(1–2), 149–176. doi: 10.1016/j.lrp.2012.09.007

*Elbanna, S., Di Benedetto, C. A. & Gherib, J. (2015a). Do environment and intuition matter in the relationship between decision politics and success? *Journal of Management & Organization*, *21*(1), 60–81. doi: 10.1017/jmo.2014.65

*Elbanna, S. & Fadol, Y. (2016a). An analysis of the comprehensive implementation of strategic plans in emerging economies: The United Arab Emirates as a case study. *European Management Review*, *13*(2), 75–89. doi: 10.1111/emre.12068

Elbanna, S. & Fadol, Y. (2016b). The role of context in intuitive decision-making. *Journal of Management & Organization*, *22*(5), 642–661. doi: 10.1017/jmo.2015.63

Elbanna, S. & Gherib, J. (2012). Miller's environmental uncertainty scale: An extension to the Arab world. *International Journal of Commerce & Management*, *22*(1), 7–25. doi: 10.1108/10569211211204483

Elbanna, S., Hsieh, L. & Child, J. (2015b). Internationalization of SMEs: A review on decision-making. *The 31st European Group for Organization Studies (EGOS) Colloquium* (July 2015). Athens, Greece.

*Elbanna, S., Kapoutsis, I. & Mellahi, K. (2017). Creativity and propitiousness in strategic decision making: The role of positive politics and

macro-economic uncertainty. *Management Decision*. doi: 10.1108/MD-02-2017-0113

*Elbanna, S. & Naguib, R. (2009). How much does performance matter in strategic decision making? *International Journal of Productivity and Performance Management*, *58*(5), 437–459. doi: 10.1108/17410400910965715

*Elbanna, S., Thanos, I. C. & Colak, M. (2015c). An exploratory study of the determinants of the quality of strategic decision implementation in Turkish industrial firms. *Journal of General Management*, *40*(2), 27–46. doi: 10.1177/030630701404000203

*Elbanna, S., Thanos, I. C. & Papadakis, V. M. (2014). Understanding how the contextual variables influence political behaviour in strategic decision-making: A constructive replication. *Journal of Strategy and Management*, *7*(3), 1–41. doi: 10.1108/JSMA-02-2014-0013

Elbasha, T. & Wright, A. (2017). Reconciling structure and agency in strategy-as-practice research: Towards a strong-structuration theory approach. *M@n@gement*, *20*(2), 107–128. doi: 10.3917/mana.202.0107

*Ericson, M. (2010). Towards a sensed decision-making approach. *Management Decision*, *48*(1), 132–155. doi: 10.1108/00251741011014490

*Fiegener, M. K. (2005). Determinants of board participation in the strategic decisions of small corporations. *Entrepreneurship Theory and Practice*, *29*(5), 627–650. doi: 10.1111/j.1540-6520.2005.00101.x

Finkelstein, S., Hambrick, D. C. & Cannella, A. A. (2009). *Strategic leadership: Theory and research on executives, top management teams, and boards*. In S. Finkelstein, D. C. Hambrick & A. A. Cannella (Eds.). Oxford: Oxford University Press.

Forbes, D. P. (2007). Reconsidering the strategic implications of decision comprehensiveness. *Academy of Management Review*, *32*(2), 361–376. doi: 10.5465/amr.2007.24349585

*Ford, C. M., Sharfman, M. P. & Dean, J. W. (2008). Factors associated with creative strategic decisions. *Creativity and Innovation Management*, *17*(3), 171–185. doi: 10.1111/j.1467-8691.2008.00486.x

*Francioni, B., Musso, F. & Cioppi, M. (2015). Decision-maker characteristics and international decisions for SMEs. *Management Decision*, *53*(10), 2226–2249. doi: 10.1108/MD-03-2015-0094

Fredrickson, J. W. (1984). The comprehensiveness of strategic decision processes: Extension, observations, future directions. *Academy of Management Journal*, *27*(3), 445–466. doi: 10.2307/256039

*Fredrickson, J. W. (1985). Effects of decision motive and organizational performance level on strategic decision processes. *Academy of Management Journal*, *28*(4), 821–843. doi: 10.2307/256239

Fredrickson, J. W. & Iaquinto, A. L. (1989). Inertia and creeping rationality in strategic decision-processes. *Academy of Management Journal*, *32*(3), 516–542. doi: 10.2307/256433

Fredrickson, J. W. & Mitchell, T. R. (1984). Strategic decision processes: Comprehensiveness and performance in an industry with an unstable environment. *Academy of Management Journal*, *27*(2), 399–423. doi: 10.2307/255932

*Friedman, Y., Carmeli, A. & Tishler, A. (2016). How CEOs and TMTs build adaptive capacity in small entrepreneurial firms. *Journal of Management Studies*, *53*(6), 996–1018. doi: 10.1111/joms.12184

Gavetti, G., Greve, H. R., Levinthal, D. A. & Ocasio, W. (2012). The behavioral theory of the firm: Assessment and prospects. *Academy of Management Annals*, *1*, 1–40. doi: 10.1080/19416520.2012.656841

*Goll, I. & Rasheed, A. A. (2005). The relationships between top management demographic characteristics, rational decision making, environmental munificence, and firm performance. *Organization Studies*, *26*(7), 999–1023. doi: 10.1177/0170840605053538

*Goll, I. & Rasheed, A. M. A. (1997). Rational decision-making and firm performance: The moderating role of environment. *Strategic Management Journal*, *18*(7), 583–591. doi: 10.1002/(SICI)1097-0266(199708)18:7<583::AID-SMJ907>3.0.CO;2-Z

Greening, D. W. & Johnson, R. A. (1996). Do managers and strategies matter? A study in crisis. *Journal of Management Studies*, *33*(1), 25–51. doi: 10.1111/j.1467-6486.1996.tb00797.x

Greenwood, R., Magan Diaz, A., Li, S. X. & Cespedes Lorente, J. (2010). The multiplicity of institutional logics and the heterogeneity of organizational responses. *Organization Science*, *21*(2), 521–539. doi: 10.1287/orsc.1090.0453

*Gu, J., Weng, Q. & Xie, F. (2012). Leadership, team and decision speed: Empirical study using cross-provincial data. *Chinese Management Studies*, *6*(4), 598–609. doi: 10.1108/17506141211280281

Halikias, J. & Panayotopoulou, L. (2003). Chief executive personality and export involvement. *Management Decision*, *41*(4), 340–349. doi: 10.1108/00251740310468072

Hambrick, D. C. (2007). Upper echelons theory: An update. *Academy of Management Review*, *32*(2), 334–343. doi: 10.5465/amr.2007.24345254

Hambrick, D. C. & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, *9*(2), 193–206. doi: 10.2307/258434

Hautz, J. (2017). Opening up the strategy process: A network perspective. *Management Decision*, *55*(9), 1956–1983. doi: 10.1108/MD-07-2016-0510

Heavey, C., Simsek, Ketchen, D. J., Boyd, B. K. & Bergh, D. D. (2008). Research methodology in strategic management: Past accomplishments and future challenges. *Organizational Research Methods*, *11*(4), 643–658. doi: 10.1177/1094428108319843

Heavey, C., Simsek, Z., Roche, F. & Kelly, A. (2009). Decision comprehensiveness and corporate entrepreneurship: The moderating role of managerial uncertainty preferences and environmental dynamism. *Journal of Management Studies*, *46*(8), 1289–1314. doi: 10.1111/j.1467-6486.2009.00858.x

*Henderson, A. D., Miller, D. & Hambrick, D. C. (2006). How quickly do CEOs become obsolete? Industry dynamism, CEO tenure, and company performance. *Strategic Management Journal*, *27*(5), 447–460. doi: 10.1002/smj.524

*Hensman, A. & Sadler-Smith, E. (2011). Intuitive decision making in banking and finance. *European Management Journal*, *29*(1), 51–66. doi: 10.1016/j.emj.2010.08.006

Hickson, D. J., Miller, S. J. & Wilson, D. C. (2003). Planned or prioritized? Two options in managing the implementation of strategic decisions. *Journal of Management Studies*, *40*(7), 1803–1836. doi: 10.1111/1467-6486.00401

Hiller, N. J. & Hambrick, D. C. (2005). Conceptualizing executive hubris: The role of (hyper-)core self-evaluations in strategic decision-making. *Strategic Management Journal*, *26*(4), 297–319. doi: 10.1002/smj.455

*Hitt, M. A. & Ireland, R. D. (1986). Relationships among corporate level distinctive competencies, diversification strategy, corporate structure and performance. *Journal of Management Studies*, *23*(4), 401–416. doi: 10.1111/j.1467-6486.1986.tb00425.x

*Hitt, M. A. & Tyler, B. B. (1991). Strategic decision models: Integrating different perspectives. *Strategic Management Journal*, *12*(5), 327–351. doi: 10.1002/smj.4250120502

*Hough, J. R. & White, M. A. (2003). Environmental dynamism and strategic decision-making rationality: An examination at the decision-level. *Strategic Management Journal*, *24*(5), 481–489. doi: 10.1002/smj.303

Huff, A. S. & Reger, R. K. (1987). A review of strategic process research. *Journal of Management*, *13*(2), 211–236. doi: 10.1177/014920638701300203

*Hurt, K. J. & Abebe, M. A. (2015). The effect of conflict type and organizational crisis on perceived strategic decision effectiveness: An empirical

investigation. *Journal of Leadership & Organizational Studies*, *22*(3), 340–354. doi: 10.1177/1548051815570038

Hutzschenreuter, T. & Kleindienst, I. (2006). Strategy-process research: What have we learned and what is still to be explored. *Journal of Management*, *32*(5), 673–720. doi: 10.1177/0149206306291485

*Iaquinto, A. L. & Fredrickson, J. W. (1997). Top management team agreement about the strategic decision process: A test of some of its determinants and consequences. *Strategic Management Journal*, *18*(1), 63–75. doi: 10.1002/(SICI)1097-0266(199701)18:1<63::AID-SMJ835>3.0.CO;2-N

*Jackson, S. E. & Dutton, J. E. (1988). Discerning threats and opportunities. *Administrative Science Quarterly*, *33*(3), 370–387. doi: 10.2307/2392714

*Jansen, R.J.G., Curşeu, P. L., Vermeulen, P. A. M., Geurts, J. L. A. & Gibcus, P. (2011). Social capital as a decision aid in strategic decision-making in service organizations. *Management Decision*, *49*(5). doi: 10.1108/00251741111130823

*Jansen, R. J. G., Curşeu, P. L., Vermeulen, P. A. M., Geurts, J. L. A. & Gibcus, P. (2013). Information processing and strategic decision-making in small and medium-sized enterprises: The role of human and social capital in attaining decision effectiveness. *International Small Business Journal*, *31*(2), 192–216. doi: 10.1177/0266242611406762

Jemison, D. B. (1984). The importance of boundary spanning roles in strategic decision-making. *Journal of Management Studies*, *21*(2), 131–152. doi: 10.1111/j.1467-6486.1984.tb00228.x

Ji, J. & Dimitratos, P. (2013). An empirical investigation into international entry mode decision-making effectiveness. *International Business Review*, *22*(6), 994–1007. doi: 10.1016/j.ibusrev.2013.02.008

Judge, T. A., Erez, A., Bono, J. E. & Thoresen, C. J. (2003). The core self-evaluations scale: Development of a measure. *Personnel Psychology*, *56*(2), 303–331. doi: 10.1111/j.1744-6570.2003.tb00152.x

*Judge, W. Q. & Miller, A. (1991). Antecedents and outcomes of decision speed in different environmental contexts. *Academy of Management Journal*, *34*(2), 449–463. doi: 10.2307/256451

Kaufmann, L., Meschnig, G. & Reimann, F. (2014). Rational and intuitive decision-making in sourcing teams: Effects on decision outcomes. *Journal of Purchasing and Supply Management*, *20*(2), 104–112. doi: 10.1016/j.pursup.2014.03.003

Ketchen, D. J., Boyd, B. K. & Bergh, D. D. (2008). Research methodology in strategic management: Past accomplishments and future challenges. *Organizational Research Methods*, *11*(4), 643–658. doi: 10.1177/1094428108319843

*Klingebiel, R. & De Meyer, A. (2013). Becoming aware of the unknown: Decision making during the implementation of a strategic initiative. *Organization Science*, *24*(1), 133–153. doi: 10.1287/orsc.1110.0726

*Langley, A. (1989). In search of rationality: The purposes behind the use of formal analysis in organizations. *Administrative Science Quarterly*, *34*(4), 598–631. doi: 10.2307/2393569

Langley, A. (2007). Process thinking in strategic organization. *Strategic Organization*, *5*(3), 271–282. doi: 10.1177/1476127007079965

Langley, A, & Abdallah, C. (2011). Templates and turns in qualitative studies of strategy and management. In D. D. Bergh & D. L. Ketchen (Eds.), *Research Methodology in Strategy and Management* (Vol. 6, pp. 201–235). doi: 10.1108/S1479-8387(2011)0000006007

Langley, A., Mintzberg, H., Pitcher, P., Posada, E. & Saint-Macary, J. (1995). Opening up decision making: The view from the black stool. *Organization Science*, *6*(3), 260–279. doi: 10.1287/orsc.6.3.260

Langley, A., Smallman, C., Tsoukas, H. & Van de Ven, A. H. (2013). Process studies of change in organization and management: Unveiling temporality, activity and flow. *Academy of Management Journal*, *56*(1), 1–13. doi: 10.5465/amj.2013.4001

Lawrence, B. S. (1997). The black box of organizational demography. *Organization Science*, *8*(1), 1–22. doi: 10.1287/orsc.8.1.1

Lewin, A. Y. & Stephens, C. U. (1994). CEO attitudes as determinants of organization design: An integrated model. *Organization Studies*, *15*(2), 183–212. doi: 10.1177/017084069401500202

*Lyles, M. A. (1981). Formulating strategic problems: Empirical analysis and model development. *Strategic Management Journal*, *2*(1), 61–75. doi: 10.2307/2485991

*Lyles, M. A. & Mitroff, I. I. (1980). Organizational problem formulation: An empirical study. *Administrative Science Quarterly*, *25*(1), 102–119. doi: 10.2307/2392229

*Mannor, M. J., Wowak, A. J., Bartkus, V. O. & Gomez-Mejia, L. R. (2016). Heavy lies the crown? How job anxiety affects top executive decision making in gain and loss contexts. *Strategic Management Journal*, *37*(9), 1968–1989. doi: 10.1002/smj.2425

*Meissner, P. & Wulf, T. (2014). Antecedents and effects of decision comprehensiveness: The role of decision quality and perceived uncertainty. *European Management Journal*, *32*(4), 625–635.

Miller, C. C. (2008). Decisional comprehensiveness and firm performance: Towards a more complete understanding. *Journal of Behavioral Decision Making*, *21*(5), 598–620. doi: 10.1002/bdm.607

Miller, C. C., Burke, L. M. & Glick, W. H. (1998). Cognitive diversity among upper-echelon executives: Implications for strategic decision processes. *Strategic Management Journal*, *19*(1), 39–58. doi: 10.1002/(sici)1097-0266(199801)19:1<39::aid-smj932>3.0.co;2-a

*Miller, D., Dröge, C. & Toulouse, J.-M. (1988). Strategic process and content as mediators between organizational context and structure. *Academy of Management Journal*, *31*(3), 544–569. doi: 10.5465/256459

*Miller, D. & Friesen, P. H. (1983). Strategy-making and environment: The third link. *Strategic Management Journal*, *4*(3), 221–235. doi: 10.1002/smj.4250040304

*Miller, D., Kets De Vries, M. F. R. & Toulouse, J.-M. (1982). Top executive locus of control and its relationship to strategy-making, structure, and environment. *Academy of Management Journal*, *25*(2), 237–253. doi: 10.2307/255988

*Miller, D. & Toulouse, J.-M. (1986). Chief executive personality and corporate strategy and structure in small firms. *Management Science*, *32*(11), 1389–1409. doi: 10.1287/mnsc.32.11.1389

Mintzberg, H., Raisinghani, D. & Théorêt, A. (1976). The structure of 'unstructured' decision processes. *Administrative Science Quarterly*, *21*(2), 246–275. doi: 10.2307/2392045

*Mitchell, J. R., Shepherd, D. A. & Sharfman, M. P. (2011). Erratic strategic decisions: When and why managers are inconsistent in strategic decision making. *Strategic Management Journal*, *32*(7), 683–704. doi: 10.1002/smj.905

*Mueller, G. C., Mone, M. A. & Barker III, V. L. (2007). Formal strategic analyses and organizational performance: Decomposing the rational model. *Organization Studies*, *28*(6), 853–883. doi: 10.1177/0170840607075262

Nadkarni, S. & Herrmann, P. O. L. (2010). CEO personality, strategic flexibility, and firm performance: The case of the Indian business process outsourcing industry. *Academy of Management Journal*, *53*(5), 1050–1073. doi: 10.5465/AMJ.2010.54533196

*Nooraie, M. (2008). Decision magnitude of impact and strategic decision-making process output: The mediating impact of rationality of the decision-making process. *Management Decision*, *46*(4), 640–655. doi: 10.1108/00251740810865102

*Nutt, P. C. (1990). Strategic decisions made by top executives and middle managers with data and process dominant styles. *Journal of Management Studies*, *27*(2), 173–194. doi: 10.1111/j.1467-6486.1990.tb00759.x

*Nutt, P. C. (1993). Flexible decision styles and the choices of top executives. *Journal of Management Studies*, *30*(5), 695–721. doi: 10.1111/j.1467-6486.1993.tb00322.x

Nutt, P. C. (2008). Investigating the success of decision making processes. *Journal of Management Studies*, *45*(2), 425–455. doi: 10.1111/j.1467-6486.2007.00756.x

*Papadakis, V. M. (2006). Do CEOs shape the process of making strategic decisions? Evidence from Greece. *Management Decision*, *44*(3), 367–394. doi: 10.1108/00251740610656269

*Papadakis, V. M. & Barwise, P. (2002). How much do CEOs and top managers matter in strategic decision-making? *British Journal of Management*, *13*(1), 83–95. doi: 10.1111/1467-8551.00224

*Papadakis, V. M., Lioukas, S. & Chambers, D. (1998). Strategic decision-making processes: The role of management and context. *Strategic Management Journal*, *19*(2), 115–147. doi: 10.1002/(SICI)1097-0266(199802)19:2<115::AID-SMJ941>3.0.CO;2-5

Parayitam, S. & Dooley, R. S. (2009). The interplay between cognitive- and affective conflict and cognition- and affect-based trust in influencing decision outcomes. *Journal of Business Research*, *62*(8), 789–796. doi: 10.1016/j.jbusres.2008.02.006

Pettigrew, A. M. (1992). The character and significance of strategy process research. *Strategic Management Journal*, *13*(S2), 5–16. doi: 10.1002/smj.4250130903

Pettigrew, A. M. (1997). What is a processual analysis? *Scandinavian Journal of Management*, *13*(4), 337–348. doi: 10.1016/S0956-5221(97)00020-1

*Pollanen, R., Abdel-Maksoud, A., Elbanna, S. & Mahama, H. (2017). Relationships between strategic performance measures, strategic decision-making, and organizational performance: Empirical evidence from Canadian public organizations. *Public Management Review*, *19*(5), 725–746. doi: 10.1080/14719037.2016.1203013

*Priem, R. L., Rasheed, A. M. A. & Kotulic, A. G. (1995). Rationality in strategic decision-processes, environmental dynamism and firm performance. *Journal of Management*, *21*(5), 913–929. doi: 10.1177/014920639502100506

Rajagopalan, N., Rasheed, A. M. A. & Datta, D. K. (1993). Strategic decision processes: Critical review and future directions. *Journal of Management*, *19*(2), 349–384. doi: 10.1016/0149-2063(93)90057-t

Samba, C., Tabesh, P., Thanos, I. C. & Papadakis, V. M. (in press). Method in the madness? A meta-analysis on the strategic implications of decision comprehensiveness. *Strategic Organization*. doi: 10.1177/1476127020904973

Samba, C., Van Knippenberg, D. & Miller, C. C. (2018). The impact of strategic dissent on organizational outcomes: A meta-analytic integration. *Strategic Management Journal*, *39*(2), 379–402. doi: 10.1002/smj.2710

Schwenk, C. R. (1988). The cognitive perspective on strategic decision-making. *Journal of Management Studies*, *25*(1), 41–55. doi: 10.1111/j.1467-6486.1988.tb00021.x

Schwenk, C. R. (1990). Conflict in organizational decision making : An exploratory study of its effects in for- profit and not-for-profit organizations. *Organization Science*, *36*(4), 436–448. doi: 10.1287/mnsc.36.4.436

Schwenk, C. R. (1995). Strategic decision making. *Journal of Management*, *21*(3), 471–493. doi: 10.1177/014920639502100304

Selart, M. (2005). Understanding the role of locus of control in consultative decision-making: A case study. *Management Decision*, *43*(3), 397–412. doi: 10.1108/00251740510589779

*Sharfman, M. P. & Dean, J. W. (1997). Flexibility in strategic decision making: Informational and ideological perspectives. *Journal of Management Studies*, *34*(2), 191–217. doi: 10.1111/1467-6486.00048

Shepherd, N. G. & Rudd, J. M. (2014). The influence of context on the strategic decision-making process: A review of the literature. *International Journal of Management Reviews*, *16*(3), 340–364. doi: 10.1111/ijmr.12023

*Simons, T., Pelled, L. H. & Smith, K. A. (1999). Making use of difference: Diversity, debate, and decision comprehensiveness in top management teams. *Academy of Management Journal*, *42*(6), 662–673. doi: 10.2307/256987

Slotegraaf, R. J. & Atuahene-Gima, K. (2011). Product development team stability and new product advantage: The role of decision-making processes. *Journal of Marketing*, *75*(1), 96–108. doi: 10.1509/jmkg.75.1.96

*Souitaris, V. & Maestro, B. M. M. (2010). Polychronicity in top management teams: The impact on strategic decision processes and performance of new technology ventures. *Strategic Management Journal*, *31*(6), 652–678. doi: 10.1002/smj.831

Strauch, M., Pidun, U. & Knyphausen-Aufseß, D. zu. (2019). Process matters – How strategic decision-making process characteristics impact capital allocation efficiency. *Long Range Planning*, *52*(2), 202–220. doi: 10.1016/j.lrp.2018.04.003

Szulanski, G., Porac, J. & Doz, Y. (2005). Strategy process: Introduction to the volume. *Advances in Strategic Management*, *22*, xiii–xxxv. doi: 10.1016/S0742-3322(05)22019-3

*Talaulicar, T., Grundei, J. & von Werder, A. (2005). Strategic decision making in start-ups: The effect of top management team organization and processes on speed and comprehensiveness. *Journal of Business Venturing*, *20*(4), 519–541. doi: 10.1016/j.jbusvent.2004.02.001

Thanos, I. C., Dimitratos, P. & Sapouna, P. (2017). The implications of international entrepreneurial orientation, politicization, and hostility upon SME international performance. *International Small Business Journal*, *35*(4), 495–514. doi: 10.1177/0266242616641749

Thomas, L. & Ambrosini, V. (2015). Materializing strategy: The role of comprehensiveness and management controls in strategy formation in volatile environments. *British Journal of Management*, *26*(1), S105–S124. doi: 10.1111/1467-8551.12075

Thywissen, C., Pidun, U. & zu Knyphausen-Aufsess, D. (2018). Process matters-The relevance of the decision making process for divestiture outcomes. *Long Range Planning*, *51*(2), 267–284. doi: 10.1016/j.lrp.2017.04.002

Van de Ven, A. H. (1992). Suggestions for studying strategy process: A research note. *Strategic Management Journal*, *13*(S1), 169–188. doi: 10.1002/smj.4250131013

Wales, W. J. (2016). Entrepreneurial orientation: A review and synthesis of promising research directions. *International Small Business Journal*, *34*(1), 3–15. doi: 10.1177/0266242615613840

*Wally, S. & Baum, J. R. (1994). Personal and structural determinants of the pace of strategic decision-making. *Academy of Management Journal*, *37*(4), 932–956. doi: 10.2307/256605

Walter, J., Kellermanns, F. W. & Lechner, C. (2012). Decision making within and between organizations: Rationality, politics, and alliance performance. *Journal of Management*, *38*(5), 1582–1610. doi: 10.1177/0149206310363308

*Walters, B. A. & Bhuian, S. N. (2004). Complexity absorption and performance: A structural analysis of acute-care hospitals. *Journal of Management*, *30*(1), 97–121. doi: 10.1016/j.jm.2003.01.005

*Wiersema, M. F. & Bantel, K. A. (1992). Top management team demography and corporate strategic change. *Academy of Management Journal*, *35*(1), 91–121. doi: 10.5465/256474

Wu, S., Levitas, E. & Priem, R. L. (2005). CEO tenure and company invention under differing levels of technological dynamism. *Academy of Management Journal*, *48*(5), 859–873. doi: 10.2307/20159702

M@n@gement

ORIGINAL RESEARCH ARTICLE

How Coopetition Influences the Development of a Dominant Design: Evidence from the Pinball Industry

Fanny Simon[1] and Albéric Tellier[2]*

[1]University of Rouen Normandy, NIMEC UPRES EA 969, Rouen, France; [2]Paris-Dauphine University, PSL University, CNRS 7088, DRM (M-LAB), Paris, France

Abstract

Most studies concerning dominant designs focus on 'collective' or 'competitive' strategies that companies deploy to impose their choices on the market. The objective of this research is to assess the extent to which 'coopetitive' strategies may lead to a dominant design. We analyzed the development of a dominant design over an 84-year period through a historical study in the field of pinball machines. Our study focuses on the five main manufacturers of pinball machines and analyzes data from 1930 to 2014. We demonstrate that companies undergo three phases that involve the progressive development of coopetitive relationships with different impacts on the generation of innovation. Because manufacturers differentiated their offerings, innovated and simultaneously imitated others, increased competition resulted. Simultaneously, external threats and the need to collectively respond to clients and partners prompted the manufacturers to cooperate with one another. Thus, our research provides a better understanding of how specific horizontal coopetitive relationships among manufacturers of the same type of products impact the development of a dominant design at the industry level. This case study suggests that as a theoretical framework, coopetition introduces new insights into the comprehension of relational dynamics during the development of dominant designs. Our observations also confirm or invalidate conclusions drawn in previous works related to coopetition strategies. In particular, this case is interesting as although the appropriability regime was weak, companies still developed coopetitive relationships, contradicting previous studies.

Keywords: *Coopetition; Dominant Design; Historical Analysis; Innovation; Pinball*

Handling Editor: Colette Depeyre. Received: 22 May 2017; Accepted: 1 January 2020; Published: 2 June 2020

Studies about technology dynamics and technological forecasting have established the concept of dominant design as quasi-paradigmatic (Hekkert & van den Hoed, 2004; Murmann & Frenken, 2006). A dominant design corresponds to the specification that defines the product category's architecture. This specification may consist of a single design feature or a complement of design features (Anderson & Tushman, 1990; Christensen, Suárez, & Utterback, 1998; Srinivasan, Lilien, & Rangaswamt, 2006).

The selection of a dominant design corresponds to a key moment in the process of technological development (Murmann & Frenken, 2006; Tushman & Murmann, 1998). This process is characterized by a first period of disruption associated with the development of several technological options and a gradual convergence on a limited number of alternatives, which leads to the selection of a dominant design. After this selection, a phase of incremental innovations begins, which reinforces the dominant design (Abernathy & Utterback, 1978; Anderson & Tushman, 1990; Murmann & Freken, 2006).

Since the pioneering work of Abernathy and Utterback (1978), researchers have focused on defining the concept of dominant design, its underlying causal mechanisms, its level of analysis, its effects on environmental conditions, and the evolution of industrial organizations (for a review, see Murmann & Frenken, 2006). Several authors have demonstrated that the 'strategic maneuvers' (Cusumano, Mylonadis, & Rosenbloom, 1992) of companies can explain the outcomes of competitions among different dominant designs (Rosenbloom & Cusumano, 1987; Suárez & Utterback, 1995).

This literature concerning dominant designs focuses on deploying either 'competitive' or 'collective' strategies. However, focusing only on these two relational logics to understand firm

***Corresponding author:** Albéric Tellier, Email: alberic.tellier@dauphine.psl.eu

actions downplays more complex forms of relationships. Technological arrangements among firms do not always lead to a decrease in competitive rivalries or a dearth of innovations over the long run (Shibata, 1993). In fact, companies may simultaneously target a collective strategy to make the technological know-how more transferable and tradable and protect their technology from imitators to foster its appropriability regime (Hurmelinna-Laukkanen & Puumalainen, 2007; Shapiro & Varian, 1998; Teece, 1986). They would then simultaneously use patents, secrets, knowledge tacitness and control of human resources turnover to avoid knowledge leakage (Hurmelinna-Laukkanen & Puumalainen, 2007) and license their technology or give access to their competitors to certain components to facilitate adoption (Ehrhardt, 2004).

Hence, more attention should be paid to 'coopetitive strategies,' which involve both cooperation and competition. We define coopetition as relationships that simultaneously involve collaboration and competition. In coopetition, companies simultaneously balance collective and individual interests (Gnyawali & Park, 2011). Thus, they collaborate to create common value and compete to reap benefits by appropriating a bigger share of the created value (Brandenburger & Nalebuff, 1995).

To our knowledge, very few researchers have deeply analyzed this type of relationship during the formation of a dominant design. Although there is a significant amount of research to explain why a dominant design emerges in an industry, the literature is less clear regarding how dominant designs emerge and how firms behave to impose their product as a dominant design (Funk, 2003).

Thus, our research question is as follows: how do specific horizontal coopetitive relationships among manufacturers of the same type of products impact the development of dominant designs at the industry level? To achieve this objective, we undertake a historical study of the development of a dominant design within the pinball machine industry. Our study focuses on the five main manufacturers of pinball machines – all located in Chicago – and analyzes data for a long time period: from 1930 to 2014.

The first part of this article presents the study's theoretical framework and research objectives, and the second part describes its methods. The historical analysis is based on four types of data: books on pinball history, articles from the economics and specialty literatures, patents in full-text from the USPTO database, and discourses from 32 industry representatives that were collected from different sources. The results are described in the third part of the article and discussed in the fourth part.

This research shows how coopetitive relationships lead to a dominant design and how those relationships form and evolve. In the pinball machine industry, the dominant design was not imposed by a single organization 'riding alone,' nor did the dominant design result from a prior agreement among industry participants favoring a collective strategy. It came from both strategic maneuvers deployed by manufacturers and triggers from third parties and the external context. As manufacturers differentiated their offerings, innovated and simultaneously imitated others, increased competition resulted. Simultaneously, external threats and the need to collectively respond to clients and partners prompted the manufacturers to cooperate with one another.

Furthermore, our case study highlights specific characteristics and gives evidence contradictory to the established literature. Hence, the ability of manufacturers to regularly and quickly integrate new technologies to strengthen the dominant design demonstrates a strong absorptive capacity. Moreover, this study highlighted that the pinball machine industry was characterized by a weak appropriability regime. In particular, mechanisms of institutional protection (more particularly patents) provided a fragile protection, as indicated by short imitation delays. These results highlight conditions in which coopetition can emerge in spite of a weak appropriability regime, which brings new insights to the work of Ritala and Hurmelinna-Laukkanen (2013).

Theoretical background

The development of a dominant design in the technology life cycle

The integration of new technologies in products, processes, or services is often characterized by conflicts among both competitors and coalitions or associations (Tushman & Murmann, 1998; Von Burg & Kenney, 2003). However, existing firms gradually converge around common choices (Geroski, 1995), and a dominant design is eventually enforced (Abernathy & Utterback, 1978). Developing a dominant design and establishing new designs involve a process comprising four phases (Anderson & Tushman, 1990; Funk, 2003; Murmann & Frenken, 2006): emergence, fermentation, selection, and incremental change.

The first phase corresponds to the emergence of a technological disruption, which can renew the core competencies and assets of an industry. This disruption affects either the product or the processes associated with the product (design, manufacturing, distribution…) (Anderson & Tushman, 1990). Regarding the product, disruption results in the emergence of a new category of product, the substitution of one product by an alternative product, or a significant improvement in the performance of existing products (Tushman & Anderson, 1986).

The second phase of the process is the 'era of ferment.' During this phase, competition occurs not only between the new technology and older products and/or services but also among different technological options. New actors, including

both existing companies and new entrants, are motivated by the opportunities offered by new technologies and try to exploit them. As companies search for the 'best solutions' to launch in a market, they often propose several technological innovations without improving industrial processes. Thus, several versions of the product are released to the market (Klepper, 1996), each based on alternative technological options and/or specific configurations.

The third phase corresponds to the selection of a dominant design. This phase starts with the development of a version that is more attractive for a significant number of users, compared to earlier products. This new design does not usually include radical innovations but rather is a creative synthesis of innovations that were introduced independently (Murmann & Frenken, 2006). Then, several actors converge gradually on one option to favor the adoption of their products (Schubert, Sydow, & Windeler, 2013; Sydow, Windeler, Schubert, & Möllering, 2012) and contribute to the achievement of a dominant design. Eventually, the dominant design is considered as the design "that wins the allegiance of the marketplace, the one that competitors and innovators must adhere to if they hope to command significant market following" (Utterback, 1994, p. 24). Dominant designs could encompass the whole product and/or individual components of the product (Murmann & Frenken, 2006). The dominant design could rely on a single technology or on a combination of technologies (Christensen et al., 1998).

As the establishment of a dominant design reduces the number of alternatives, it enhances the economy of scale, reduces uncertainty in the market, and enforces standardization (Abernathy & Utterback, 1978). The existing literature is not very clear regarding the differences between standards and dominant designs. Some prior research has used the terms interchangeably, and terms such as 'standards wars' have been used to denote the battle between designs (Shapiro & Varian, 1998; Srinivasan et al., 2006). The term 'standard' must be used to denote the technical specifications for reference, compatibility, and connectivity that are required for the proper functioning of products that must be connected with others (such as DVDs, smartphones, and PCs). Standards in a product category serve to enhance functional acceptance, which does not relate to market acceptance. Conversely, market acceptance is an integral aspect of dominant design (Srinivasan et al., 2006). In this paper, in accordance with the work of Funk (2003), we define a 'standard' as an interface standard and a 'dominant design' as a product (or subproduct) architecture. For example, smartphones have different standards (the 'air-interface' standard, 'operating system' standard, 'software-hardware' interface…), but a dominant design has emerged since the launch of the iPhone.

The fourth phase is the 'era of incremental change.' This phase is characterized by gradual improvements in currently exploited technologies, which reinforce the dominant design (Tushman & Anderson, 1986). Companies then favor exploitation, which involves the efficient use of existing knowledge (March, 1991). Thus, the assets and competencies of existing companies are closely built into the chosen design, which makes organizations more vulnerable to major technological disruption. Unsurprisingly, a technological disruption results in a new cycle that challenges the dominant design.

Throughout the technological cycle, innovations are launched, and different types of innovations predominate during the three phases of the dominant design formation. Furthermore, those innovations can relate to a core concept or a particular component, as a product, like any other complex system, does not correspond only to an assembly of interacting elementary components but rather consists of a nested hierarchy of different subsystems (Simon, 1962; Murmann & Frenken, 2006). Thus, according to Henderson and Clark (1990), four types of innovation can be distinguished during the technological cycle (Table 1).

A radical innovation establishes a new product category using new components and introduces a paradigm shift. It is often associated with the introduction of a new technology. This type of innovation mainly appears in the first phase of the technological cycle. Architectural innovations concern changes in the association among the concepts and product components.

It is mostly associated with the 'fermentation' phase of the technological cycle as actors are searching for the best design to satisfy the market. Those changes in architecture lead to numerous product innovations, as shown by Abernathy and Utterback (1978). The establishment of a dominant design emerges as the majority of actors accept the product architecture. After the selection of the dominant design, actors favor incremental innovations or modular innovations that renew the concept (notably by adding a component or a feature) without disrupting all components.

Strategic maneuvers: A causal mechanism in the development of dominant designs

Scholars of dominant designs have appealed to a variety of underlying causal mechanisms to explain why a particular

Table 1. Henderson and Clark's (1990) innovation framework

Linkages between core concepts and components	Core concepts	
	Reinforced	Overturned
Unchanged	Incremental innovation	Modular innovation
Changed	Architectural innovation	Radical innovation

Source: Henderson and Clark (1990, p. 12).

design emerges as the dominant design (Murmann & Frenken, 2006). They can be classified into four categories:

1. A design becomes dominant because it represents the best technological compromise between the different functional characteristics of the technology (Christensen et al., 1998; Suárez & Utterback, 1995).
2. The selection of a dominant design is caused by the existence of network effects and economies of scale that create dynamic, increasing returns (Arthur, 1989; Cecere, Corrocher, & Battaglia, 2015; Katz & Shapiro, 1985).
3. A dominant design emerges through a combination of sociological, political and organizational dynamics (Tushman & Rosenkopf, 1992). In particular, actor network theory (Akrich et al (2002a, b); Bijker, Hughes, & Pinch, 1989) focuses on the influence of conflicting interests and trade-offs between different actors on innovation characteristics.
4. The strategic maneuvers followed by firms to address their competitors influence the development of a dominant design (Cusumano et al., 1992; Rosenbloom & Cusumano, 1987; Suárez & Utterback, 1995).

The selection of a dominant design implies that actors lead toward similar options. Imitation and collaboration, for example, are cornerstones in the process of dominant design development. However, the stabilization of a dominant design depends on relationships that firms have (or do not have) with their competitors. Those relationships can involve three different logics: confrontation, cooperation, and avoidance (Kœnig, 2004). These three logics can be used to define three 'strategic maneuvers' (Cusumano et al., 1992) that can lead to a dominant design (Figure 1).

A 'competitive strategy' (Figure 1) means that the innovative firm attempts to impose its own design and favors

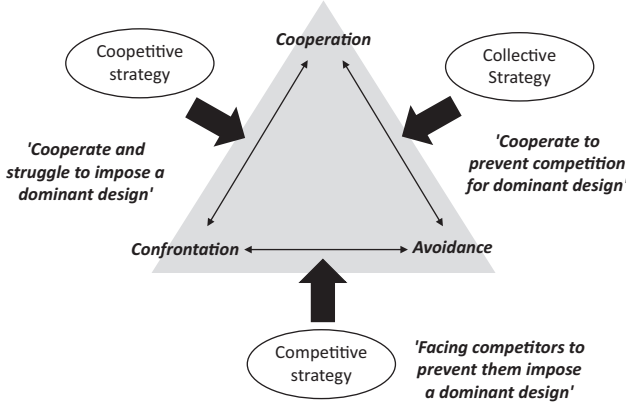


Figure 1. Imposing a dominant design: Three types of strategic maneuvers

competition with alternative technologies and products. As the innovative firm attempts to obtain substantial returns, that firm (which 'rides alone') may enhance its technology leadership to obtain (at least for some time) a technology monopoly and to discourage the launch of competitive products. The firm that originated the winning design flourishes, whereas other firms that invested in alternative designs incur economic losses (Murmann & Frenken, 2006). Fernández and Valle (2019) noted that this strategy occurs during the emergence of de facto dominant designs, which are derived from market selection. In those instances, the pioneering firm (which may have launched a disruptive technology) needs to invest considerable resources to conquer a large customer base, such as Intel with its microprocessor. Then, the firm can usually convince customers and suppliers that it is winning the game through advertising and statements. The success of this type of strategy depends on the appropriability regime (Teece, 1986). The appropriability regime of a firm is defined as the extent to which innovations can be protected from imitators. "It consists of appropriability mechanisms – the means of protecting both the innovation itself and the increased rents due to research and development" (Hurmelinna-Laukkanen & Puumalainen, 2007, p. 96). If appropriability is low, competitors will be able to easily imitate the design defined by the pioneering firm. However, a high appropriability regime can lead to the development of independent market segments (local monopolies) and hamper the formation of a unique dominant design (Cecere et al., 2015).

As a 'collective strategy' is fostered (Astley & Fombrun, 1983), cooperation is favored to avoid confrontation between different designs. In certain industries, actors know that they should converge on one technological option to favor the adoption of a new technology (Schubert et al., 2013; Sydow et al., 2012). Consequently, companies shape a network of relationships with other firms to foster the development of a dominant design (Ehrhardt, 2004; Garud, Jain, & Kumaraswamy, 2002). This goal of collectively defining technologies and dominant design requires formal agreements between firms and leads to coalitions, research and development (R&D) collaborations, licensing, and the development of broad networks of companies (Cusumano et al., 1992; Dussauge & Garrette, 1999; Liebowitz & Margolis, 1995; Murmann & Frenken, 2006; Soh, 2010). Actors can also set up an intermediation structure to define standards, coordinate and control the actions of members, and develop agreements with other actors (e.g., the 'DVD Forum' created by 10 of the biggest players in the consumer electronics industry to develop a new design in the video market as a replacement for the Video Home System) (King et al., 1994). Existing studies about dominant design demonstrated that its success depends on the abilities of innovative firms to garner a community to support the new technology (Ehrhardt, 2004; Garud & Karnøe, 2003; Soh, 2010; Von

Burg & Kenney, 2003). Companies derive 'relationship benefits' (Dyer & Singh, 1998) through the adoption of a collective strategy, such as pooling of critical resources, identification of opportunities, generation of awareness about the technology, reduction of the perceived uncertainty, and diminution of competing alternatives (Ehrhardt, 2004).

As a 'coopetitive strategy' is followed (Figure 1), firms cooperate and compete simultaneously to impose a dominant design. The main challenge is then to find the right amount of cooperation to enhance value creation as well as the appropriability regime to obtain a return on the innovation investment (Hurmelinna-Laukkanen & Puumalainen, 2007; Ritala & Tidström, 2014). A firm engaged in coopetition tries to learn from its competitor but needs to prevent imitation to retain its cutting-edge advantage. Thus, the firm's ability to acquire knowledge from external sources (absorptive capacity) (Cohen & Levinthal, 1990) and to protect its innovations from imitation (appropriability regime) are key elements in fostering the positive outcomes of collaborating with competitors (Ritala & Hurmelinna-Laukhanen, 2013). The deployment of coopetitive relationships has also been demonstrated to be a possible strategy for standardization (Mione, 2009) and the emergence of a dominant design (Yami & Nemeh, 2014). Certain relationships have been highlighted to achieve that goal: companies should avoid collaboration with close rivals (Ehrhardt, 2004) or with only horizontal competitors (Lee, 2007). However, to our knowledge, very few researchers have deeply analyzed the effects of these coopetitive relationships on the formation of a dominant design. Actually, most works focus on either competitive strategies to gain an advantage on the market, suggesting that the company aims to exploit the design exclusively, or cooperative strategies to compete on the market and gain competitor support by opening the design (Fernández & Valle, 2019), but the impact of coopetitive relationships is unknown.

Coopetitive relationships and innovative outcomes

Although coopetition has become a prominent research stream in the management literature, the concept of coopetition is still defined in different ways (Peng, Yen, & Bourne, 2018), and the field of research is still fragmented (Bengtsson, Kock, & Lundgren-Henriksson, 2019). In many recent studies, coopetition is often widely defined as cooperation with competitors (Jakobsen & Steinmo, 2016; Ritala & Tidström, 2014; Yami & Nemeh, 2014). However, we prefer to adopt a narrower definition, which allows a better understanding of the concept and its implication (Fernandez, Le Roy, & Gnyawali, 2014). Consequently, we follow Gnyawali and Park's (2011) perspective and consider that two conditions are necessary for a situation to be characterized as coopetitive:

1. Competition and cooperation occur at the same time (simultaneity criteria)
2. Companies maintain horizontal competitive relationships (rivalry criteria)

According to Figure 1, simultaneous confrontation and collaboration clearly sets coopetition apart from other types of interorganizational relationships (Ritala & Tidström, 2014). Many empirical studies have been performed to demonstrate the relevance of coopetition in business life and research (Bengtsson et al., 2019; Bouncken, Gast, Kraus, & Bogers, 2015; Gnyawali & Song, 2016). Numerous researchers have attempted to analyze the drivers, antecedents, and determinants explaining why firms adopt coopetition strategies. According to Bengtsson and Raza-Ullah (2016) and Mariani (2019), it is possible to distinguish the following three partially overlapping categories of coopetition drivers: relation-specific, external and internal drivers. Some relation-specific drivers have been identified. Czakon and Czernek-Marszalek (2019) explained how different trust-building mechanisms encourage competitors to enter coopetitive relationships. Klymas (2019) identified organizational cultural features and cultural models that could drive coopetitive relationships in different industries.

The external drivers include environmental conditions, such as technological demand, industrial characteristics, and influential stakeholders (Mariani, 2019). Ties with third party and vertical partners of coopetitors play a substantial role both in the formation of coopetitive relationships and in their evolution (Bengtsson & Kock, 2000; Chiambaretto & Rigaud, 2013; Fernandez et al., 2014). Hence, customers may require competitors to develop collaborative relationships to launch bundle offerings (Chiambaretto & Dumez, 2012; Choi, Garcia, & Friedrich, 2009). Other external drivers, including the influence of regulatory bodies and policy makers (Bengtsson & Raza-Ullah, 2016; Castaldo, Möellering, Grosso, & Zerbini, 2010; Depeyre & Dumez, 2010; Dorn, Schweiger, & Albers, 2016; Mariani, 2019), have been highlighted. Those third parties also influence the development of coopetitive relationships and the rate of innovation launched on the market. They are described both as coordinating the coopetitive relationships (Bengtsson & Kock, 2000) and creating tensions among coopetitors to benefit from the conflict (Fernandez et al., 2014).

The internal drivers include firms' goals, resources, and capabilities. A major internal driver of coopetition strategies is innovation (Bengtsson & Kock, 2014; Fernandez, Le Roy, & Chiambaretto, 2018; Gnyawali & Park, 2009, 2011; Ritala & Hurmelinna-Laukkanen, 2009). High market uncertainty, low competition intensity, and high network externalities increase the positive effect of coopetition on innovation (Ritala, 2012) as well as the appropriability regime and absorptive capacity (Ritala & Hurmelinna-Laukkanen, 2012).

Scholars have mainly focused on innovation as an outcome of a coopetition strategy. They have found mixed results, which indicate that there is a gap in our knowledge and a lack of consensus (Jakobsen & Steinmo, 2016; Ritala, Kraus, & Bouncken, 2016). Furthermore, most papers on these topics study the effect of different relational strategies on the firm's outcome (such as the firm performance) (Hamouti, Robert, & Le Roy, 2014; Ritala & Hurmelinna-Laukkanen, 2009; Tomlinson, 2010) and do not analyze the effect of individual coopetitive strategies on an industry. Thus, coopetition and its impact on industry changes have been underresearched, particularly over long time spans (Czakon & Dana, 2013).

Our objective was to study the evolution of coopetitive relationships over a long period of time, which allows us to gain a better understanding of the outcomes of those relationships in terms of innovation generation and industry evolution through the development of a dominant design. We consider horizontal coopetitive relationships among designers of the product as part of a broader network of relationships (which are not characterized as coopetitive). Thus, as proposed by Ritala and Tidström (2014), we address the problem concerning the impact of coopetitive strategies not only at the dyadic level but also at a broader level of analysis including all actors involved in the development of the dominant design. Furthermore, existing works concerning coopetition have overlooked the variations in the intensities of coopetitive relationships and the balance between coopetition and competition (Gnyawali & Ryan Charleton, 2018). Gnyawali and Ryan Charleton (2018) defined such a balance as the evenness between cooperation and competition, and emphasized the stability and positive consequences of such a balance. However, these authors mentioned that it is difficult to achieve an ideal balance and that the content of the relationships oscillate around this model. Thus, in our article, we adopt such a perspective.

To answer our research question regarding the impact of specific horizontal coopetitive strategies on the development of a dominant design at the industry level, we perform a historical study of the development of a dominant design in the field of pinball machines.

Methods

Research design and case selection

Research design

This research is based on a longitudinal case study. Due to limited research on coopetitive relationships in dominant design formation, a qualitative approach was adapted for this study (Stake, 1994). A historical case study design was used to examine how coopetition leads to a dominant design for two main reasons. First, the use of historical case studies is recommended to address 'how' questions (Yin, 2009). Second, a historical analysis is particularly suitable for research regarding technological developments; as these developments are characterized by evolution and disruptions, it is essential to refer to their changes over a long period of time.

Case selection

As part of a research program about the skill games sector,[1] we performed a historical analysis of the development and decline of pinball from 1930 to 2014 (Tellier, 2015, 2017). The said project started with an opportunity to collect abundant data on the history of pinball industry. The first analyses demonstrated that the leading manufacturers of those machines managed to impose a dominant design and maintain a favorable competitive position until the 1990s. We realized that the dominant design was enforced without a formal agreement among manufacturers and implementation of intermediation structures. Over the period that was studied, we identified competitive as well as collaborative relationships concomitant to the development of the dominant design. Consequently, by studying the development of the leaders of the pinball industry in the United States, we identified an unexpected observation that led us to change our initial research program by studying how coopetitive relationships may lead to a dominant design. Thus, this single-case study can be considered a 'revelatory case' (Yin, 2009). This situation exists when a researcher has an opportunity to observe and analyze a phenomenon.

Case study presentation

A pinball machine is an arcade game in which a player scores points by manipulating one or more steel balls on a playfield inside a glass-covered cabinet. This particular arcade game became popular in the United States toward the end of the 1920s in the context of Prohibition and the economic crisis, particularly as 'Penny Arcades' were established (Huhtamo, 2005). Our analysis focused on the five primary pinball manufacturers: three worldwide leaders (Bally, Gottlieb, and Williams) and two outsiders (Chicago Coin and Genco, which merged at the end of the 1950s).

Some European and Japanese manufacturers tried to enter this market. These actors remained marginal. For example, in Japan, a total of 25 models of pinballs were introduced by Sega from 1971 to 1979 but were mainly for the local market. Until the mid-1990s and in spite of the emergence of video games at the beginning of the 1980s, pinball manufacturers continued to experience high turnover. However, that time period ultimately led to the decline of the pinball machine industry (Tellier, 2017). In 1977, Chicago Coin was sold and had

[1] The skill game sector includes firms specializing in the production, distribution, and operation of gaming devices that offer no winnings to players. It is basically foosball, pinball, billiards, arcade games and darts.

ceased operations by 1985. Bally was purchased by Williams in 1988, and Gottlieb closed in 1996. Williams attempted to develop new models that combined pinball and video games but was forced out of business in 1999. Since 2000, there has been only one manufacturer of pinball machines worldwide, Stern, which releases only three or four new models every year.

Role repartition in the pinball industry was as follows (Figure 2). Manufacturers designed and produced a new model, then purchased components from different suppliers and obtained licenses from Hollywood studios or entertainers to differentiate their products. In addition, manufacturers relied on independent designers. Pinball machines were then distributed to operators who purchased them. Thus, these operators were the direct customers of the manufacturers, and they marketed to arcade rooms that rented the machines. Profits earned on each machine were shared between the owner of the arcade room and the operator (approximately 50% each). The operator maintained and repaired the machines, which typically entailed maintaining a supply of spare parts for these repairs.

Data collection and data analysis

Data collection

In this research, we use secondary data (Silverman, 2000), that is, data that have already been gathered by someone else. More precisely, we use materials diverted from the purposes for which they were originally collected and processed to become part of a new research project. Consequently, this research can be characterized as an 'assorted analysis' (Chabaud & Germain, 2006; Heaton, 2004). With this kind of research, it is important to carefully consider the quality of the collected data (Stewart, 1984).

Our historical analysis is based on four types of data. First, we used books and encyclopedias about the history of pinball machines (Colmer, 1976; Rossignoli, 2011; Ruben, 2018; Shalhoub, 2002, 2004, 2005) that provided detailed data regarding different versions, quantities manufactured, technologies, and innovations used in the industry. Then, articles were collected from the economics and various specialized presses. We also conducted a study on the United States Patent and Trademark Office (USPTO) patent full-text database. This database lists the complete texts of patents since 1976. For the three leading pinball manufacturers of this period (Bally, Gottlieb, and Williams), we collected 123 patents. Finally, we registered and analyzed interviews by individuals who had worked in the pinball machine industry (manufacturers, design agencies, arcade staff, etc.) and/or who had studied its development. These interviews had been filmed for video programs regarding the industry and its history and constitute a total of 9 h of recording (Batson & Bellgraph, 2008; Helms, Cook, & Fisher, 1997; Maletic, 2010; Sullivan, Jacobsen, & Rickard, 2010). In addition, written interviews were collected and analyzed. The community website, 'The Pinball Blog,' provides free access to interviews with pinball professionals. Included in our analysis were interviews published *in extenso* (approximately 550 pages) in the first five volumes of the *Pinball Magazine* and a special edition (Joosten, 2012–2018). Finally, we obtained access to interviews with 32 actors in the pinball industry (Table 2). These interviews were recorded between 1997 and 2018.

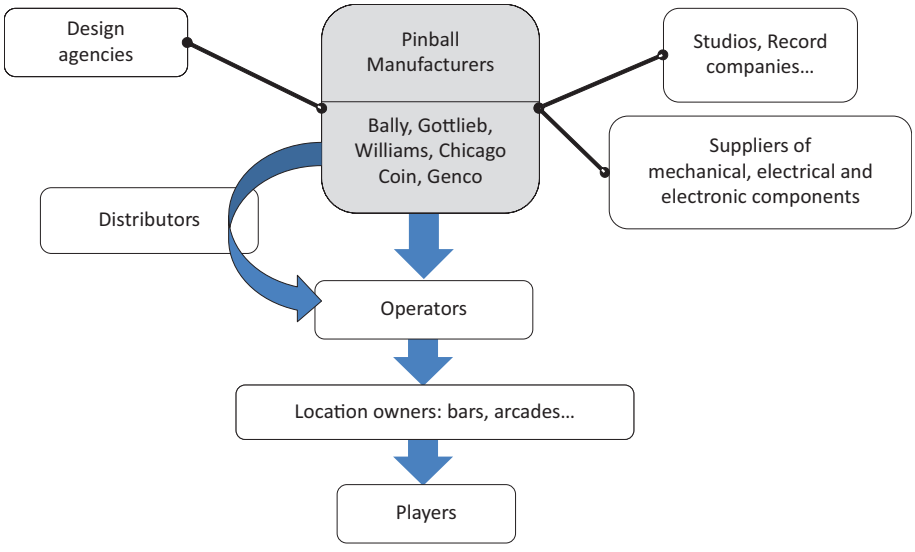


Figure 2. Key actors in the pinball industry

Data analysis

We performed an empirical analysis in three stages, which are presented below.

Stage 1: Historical analysis. First, we conducted a historical analysis of the development and decline of the pinball industry. This allows us to highlight the technologies that were used, the various products that were launched, and to identify the main actors and their relationships. Books were the primary sources of information used to construct a detailed chronology. That chronology was progressively developed using other sources that were collected. We add complementary data until we achieve saturation (Glaser & Strauss, 1967).

Stage 2: Characterization of the development of the dominant design. To characterize the development of the dominant design, we identify the main product innovations and successive models of pinball machines from 1930 to 2014.

Table 2. Sources of interviews

ID number	Title	Sources					
		The Pinball Blog	*Pinball Magazine*, n°1–5 & Special Issue, 2012–2018	*Pinball Passion*, Documentary, 2008	*The History of Pinball*, Documentary 1997	*Special When Lit*, Documentary, 2010	*Tilt, The Battle to Save Pinball*, Documentary 2010
1	GD, MK, HL	X	X	X	X	X	
2	GD	X			X	X	X
3	GD	X					X
4	GD	X		X		X	
5	GD	X					
6	I	X					
7	E	X					
8	GD	X					
9	GD		X	X			
10	I		X				
11	GM			X			
12	GAM, O			X		X	
13	GD		X	X			
14	GAM			X			
15	SD			X	X		
16	GD			X		X	X
17	E			X			
18	GM			X		X	
19	H				X		
20	GAM, O					X	
21	HL		X			X	
22	GD, GM						X
23	GD		X				X
24	SD						X
25	SD						X
26	PPS					X	
27	GD		X				
28	GD		X				
29	I		X				
30	E		X				
31	SD, GD		X				
32	GD, SD, HD		X				

GD: Game Designer, MK: Marketer, HL: Head of Licensing, E: Engineer, I: Illustrator, H: Historian, HD: Hardware Designer, SD: Software Designer, O: Operator, GAM: Game Arcade Manager, GM: General Manager, and PPS: Pinball Parts Seller.

We used data triangulation by including data from four main sources:

1. The listing, proposed by Rossignoli (2011), includes 3,000 models produced between 1933 and 1998. That listing details the characteristics of the different models.
2. The three books by Shalhoub (2002, 2004, 2005) present all models produced year after year between 1932 and 2005 and provide information on the main innovations. Pictures of pinball machines and, more particularly, the screening of playfields allow us to identify the adoption of specific features.
3. The Internet Pinball Database (IPDB) provides a list of 5,990 pinball machines, poll tables, and gambling games produced between 1926 and 2014, as well as the technical features of several models.
4. The Internet Pinball Serial Number Database (IPSND) collects the serial numbers of pinball machines and publishes a database of pinball machines produced between 1931 and 2016.

The combination of these data allowed us to detect the arrival of the main product innovations and track the development of the dominant design (Figure 3). We discovered events on the emergence of innovations or the dropout of specific characteristics. A total of 59 main product innovations were identified (Table 5). Because dominant designs could encompass the whole product and/or an individual module of the product (Murmann & Frenken, 2006), these innovations were classified into three categories: architectural, modular, incremental (Henderson & Clark, 1990; Smith & Tushman, 2005). In accordance with Henderson and Clark's (1990) work, we do not label changes to pinball design as radical innovations. A radical innovation establishes a new product category using new components and introduces a paradigm shift. Consequently, we only consider the launch of the first pinball machine and later the introduction of video games to replace pinball machines to be radical innovations. A radical innovation is often associated with the introduction of a new technology. However, in the pinball industry, new technologies, which were integrated after 1970 by manufacturers, reinforced the dominant design.

We also assessed the time lag between the emergence of a product innovation and its integration in the dominant design. Anderson and Tushman (1990) defined a dominant design "as a single configuration or a narrow range of configurations that accounted for over 50 percent of new products sales or new

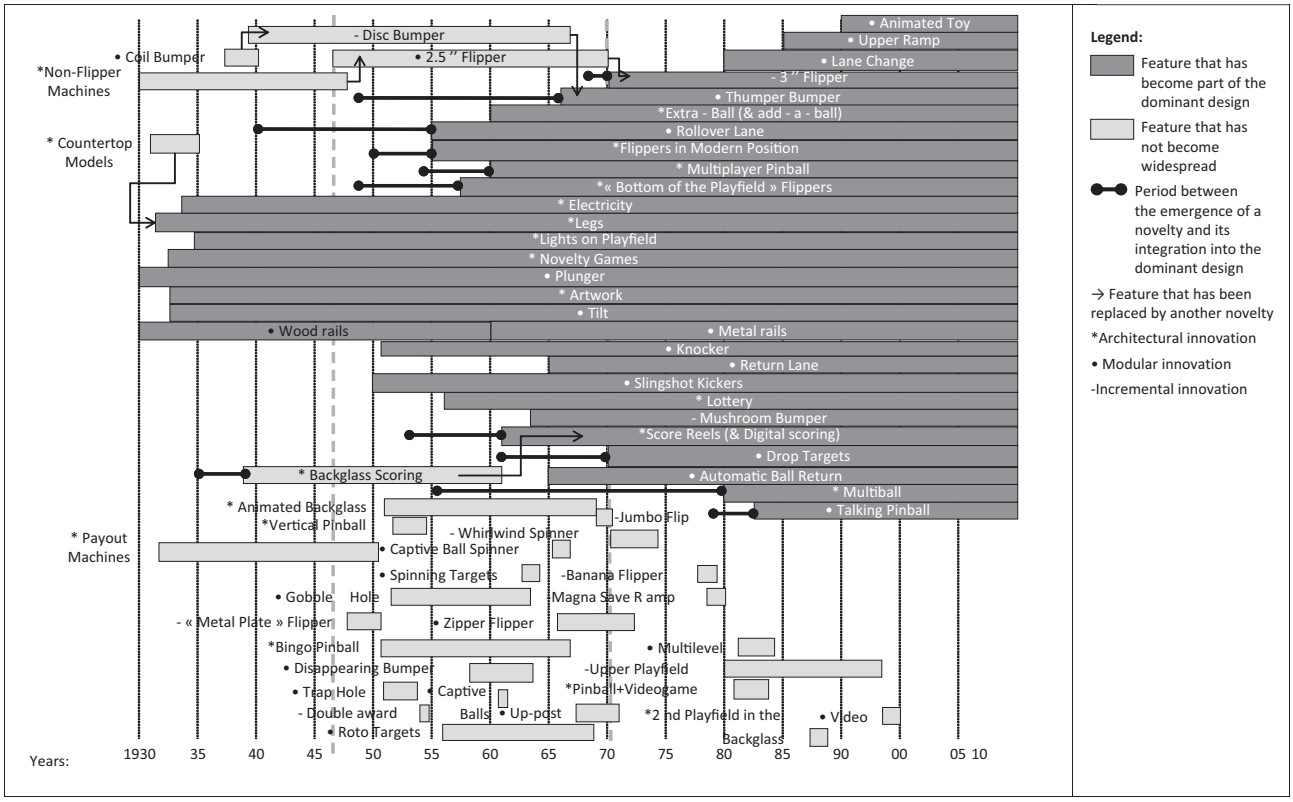


Figure 3. Chronological analysis of the development of the dominant design (1930–2014)

process installations and maintained a 50-percent market share for at least four years." Because sales figures of the different models are not available, we considered that a specific feature incorporates (or not) the dominant design if we could track it (or not) on 50% of the models designed or when the three main manufacturers integrated the feature (Bally, Gottlieb, and Williams). In Figure 3, we represent those features that have become part of the dominant design and those that have not become widespread. We also highlight changes in the dominant design by indicating the features that were replaced by others as well as the length of time before a new characteristic became integrated into the dominant design.

Stage 3: Thematic analysis of interviews. As we collected data from numerous interviews, we needed to simplify the data. First, we selected relevant paragraphs addressing our research topic (Huberman & Miles, 2002). This step was crucial, as the interviews had not been performed by the authors of this paper and addressed various subjects.

Then, these excerpts from interviews were coded. Our approach was inspired by the work of Fernandez et al. (2014), who combined literature-based conceptual arguments and insights from in-depth study of one exemplar case of coopetition. The coding was based on the literature review. The first objective was to identify coopetitive relationships between pinball manufacturers. The second objective was to identify the dimensions of coopetition strategies related to the development of a dominant design. Consequently, we obtained the first list of codes from a literature review related to coopetition. Particularly, we differentiate between cooperative and competitive behaviors and determine whether these behaviors occur during the same period and are related to relationships among manufacturers. The definitions of these two codes are provided in Table 3. Then, we define a list of codes representing the typical characteristics shaping the development of dominant designs. First, we track the number and type of innovations launched on the market. Actually, these numbers and forms of innovation allow us to precisely determine whether a dominant design has emerged and the period related to the tipping point, as the number of disruptive innovations decreases after the selection of the dominant design, and incremental innovations are subsequently enhanced. Similarly, the development of standardization characterizes the phase after the selection of the dominant design. Then, we examine practices related to imitation and the protection of new innovation and the emergence of disruptive technologies (as defined in Table 3), as these events should foster the development of a new dominant design. Hence, in their synthesis, Fernández and Valle (2019) emphasized the importance of a high level of appropriability and, thus, protection for the firms to reap the benefits of the dominant design. Each category was divided into several subcategories (see Table 4 for an example).

Table 3. Categories from the literature review

Objectives	Category	Justification/specifications
Characterization of coopetitive relationships	Cooperation Competition	Those two categories refer to the definition of coopetition (Ritala & Tidström, 2014). In the interview, we identify extracts describing cooperative and competitive behaviors among manufacturers (rivalry criteria) and we check whether cooperative and competitive maneuvers took place at the same time by examining the reference period (simultaneity criteria) (Gnyawali & Park, 2011).
Determination of whether a dominant design emerged	Innovation	Throughout the technological development cycle, firms innovate. Before the selection of a dominant design, numerous product innovations are launched on the market (Abernathy & Utterback, 1978). After the dominant design selection, actors favor incremental innovations (Tushman & Anderson, 1986)
	Standard	The establishment of a dominant design enforces standardization (Abernathy & Utterback, 1978). The deployment of coopetitive relationships has been proven to be a possible strategy for standardization (Mione, 2009). The term 'standard' must be used to denote the technical specifications of the reference, compatibility, and connectivity required for the proper functioning of products (Srinivasan et al., 2006).
Description of the factors shaping the development of the dominant design	Imitation	The development of a dominant design supposes that actors converge on common choices. Imitation practices are key in the development process of dominant designs, particularly actors who favor competitive strategies (Cecere et al., 2015; Murmann & Frenken, 2006).
	Protection	During the technology life cycle, firms may attempt to protect their technology from imitators to foster their appropriability regime (Hurmelinna-Laukkanen & Puumalainen, 2007; Shapiro & Varian, 1998; Shibata, 1993; Teece, 1986). Firms will use patents, secrets, and knowledge, and control human resources turnover to avoid knowledge leakage (Hurmelinna-Laukkanen & Puumalainen, 2007) and license their technology or give access to their competitors to certain components to facilitate adoption (Ehrhardt, 2004).
	Technology	The development of a dominant design is linked to the integration of new technologies in products, processes, or new services. A new technology can contribute to the development of a new dominant design (Hekkert & van den Hoed, 2004; Murmann & Frenken, 2006). The dominant design could rely on a single technology or on a combination of technologies (Christensen et al., 1998). Radical innovation is often associated with the introduction of a new technology (Henderson & Clark, 1990). Ritala and Sainio (2014) showed that coopetition is negatively related to technology radicalness.

Table 4. Examples of coding

Category	Subcategories	Examples of analysis units
Protection	Patent	1. Sometimes you come up with an idea that you put in a game and you don't change it but you may work on parts of the machine around the new idea but you don't change the idea if you have a good one as we had to patent some of it. [2/1962] 2. One of the points we raised that was that we couldn't use the star rollovers, because Bally had come after Game Plan to tell them that they had to cease-and-desist because they had the patent or the rights to those round star rollovers. [1/1979]
	License	1. Artwork also changed on Spy Hunter. Originally, I designed the game with an Elvis theme. The bonus lights represented the push buttons on the front of a juke box. Each button pair represented a different Elvis song. Aligning 2 bonus lights played the indicated song. The only problem with that was that at the time, Bally had not secured the Elvis license. [5/1984] 2. The original intent was to have Star Wars as the first game licensed … That was the richest agreement we had done as a license for a pinball product, but not totally out of the realm of what I thought was realistic. I felt that all bets were off and we had to. We needed this to help the platform. [1/1999]
	Secret	1. Williams' Banzai Run came out only two months later [after Bally's Blackwater 100]. They had no idea what I was doing. At least I don't think they did. I don't know what kind of secrets got passed between the companies … I think it was just a coincidence they came out so close. I never suspected anything, but I was also never aware of copying going on. [9/1988] 2. There was an idea that electronics was the way to go. They did some electronic slot machines first. They were basically poker machines if I remember correctly. That group spun off into electronic pinball machines. So the system was developed more or less in the back room with no input from anybody. This was super, super secret. There were only a handful of people who knew about it. That's the way the Bally system was designed. [27/1976–1978]
	Human resources control	1. When I was first starting out in design, it was industry policy that a designer could not put his name on a game. That was to prevent another company from finding out who designed what game and hiring them away from their current company. That was archaic thinking. In fact, literally within hours of a new game being placed at a test location, everyone in the design industry knew who designed what game and what features were on it. [5/1974]

The contents of the different texts used were segmented into analysis units, which were then classified into the defined categories. The chosen analysis units were parts of sentences, whole sentences and even groups of sentences with a bearing on the same theme. The inference presumed to link the selected units to the respective categories is one of inclusion (X unit is an example of Y category). The process of attribution of an analysis unit to a category occurs without interpretation. It is therefore a descriptive coding system (Huberman & Miles, 2002). Certain quotations are used for illustrative purposes. In these quotations, the number before the slash indicates the ID number of the respondent (Table 2) and the dates after the slash indicate the time period covered or the reference year (see Table 4 for an example).

The protocol was tested by a process of double-coding (Weber, 1990). This process consists of confirming the definition of the analysis units and their classification into categories (inter-coder reliability) and dealing with any divergences.

Results

The development and stabilization of a dominant design

First, we assess whether the pinball industry experienced a dominant design. Consequently, we map the different innovations that occurred from 1930 to 2014. Figure 3 represents those different innovations and brings to light three phases. The first phase from 1930 to 1947, which corresponds to the era of ferment, encompasses 15 innovations, and a majority of those innovations have been integrated into the dominant design (although sometimes with a long time lag). The second phase (from 1947 to 1970) is the most productive in terms of innovation. However, several innovations were not successfully adopted into subsequent versions of pinball, which is a characteristic of the selection phase of the development of a dominant design. We consider that the selection phase ended in 1970 for two main reasons. First, after 1970, the number of product innovations declined significantly (0.27 per year, Table 5). From 1970 to 1980 (Figure 3), architectural innovations no longer changed the product design and no modular innovations were integrated into the dominant design (Banana flipper, Magna save ramp, Whirlwind spinner).

Then, as described in Figure 3, from 1970 onward, the 3" pinball and drop targets were generalized. Several experts of pinball consider that those two product innovations were very attractive for players and generated leads for those products. The 3" pinball offered a better control as well as drop targets, which really turned pinball into a game of skill (Shalhoub, 2004).

Thus, in 1970, the dominant design was established at three different levels: the global design of the product, the game board configuration, and the modules that constituted that board. The 'flipper,' the 'mushroom bumper,' the pediment, and

Table 5. Types of innovations in the pinball industry

	Era of ferment 1930→ 1947	Selection phase 1947→ 1970	Incremental change 1970→ 2014
Architectural innovations	9 (60%)	10 (31.3%)	2 (16.7%)
Modular innovations	5 (33.3%)	17 (53.1%)	6 (50%)
Incremental innovations	1 (6.7%)	5 (15.6%)	4 (33.3%)
Total	**15 (0.88 per year)**	**32 (1.39 per year)**	**12 (0.27 per year)**
Number and type of innovations integrating the dominant design	9 (60%)	15 (46.9%)	4 (33.3%)
	Architectural: 5	Architectural: 7	Architectural: 0
	Modular: 4	Modular: 7	Modular: 4
	Incremental: 0	Incremental: 1	Incremental: 0

the general use of targets, extra balls, and the 'match bonus' were the most typical elements of this dominant design (Figure 3). From 1970 to 2014, the dominant design was not questioned. However, in the 1980s, the emergence of competition from video games compelled manufacturers to expand that design by integrating new features (Lane changes, Upper ramps, Animated toys…). Consequently, although the dominant design became increasingly more complex, no innovation deeply changed its functioning (Figure 3 and Table 5). This situation corresponds to the 'incremental change era.'

Figure 3 shows that throughout pinball history, manufacturers attempted to introduce novelties to differentiate their products; however, several of them were not incorporated into the dominant design. Similarly, our historical analysis demonstrates that manufacturers managed to exploit new technologies. Thus, from the beginning of the 1930s to the end of the 1940s, products were designed using mechanical processes. From the 1950s to the end of the 1970s, electromechanical technologies were favored. Electronics were broadly used in the 1980s, and videos were introduced in the 1990s. These new technologies resulted in the introduction of new modules and new game practices (i.e., electronics enhanced the development of multiplayer modes). The dominant design was enforced primarily by improvements to modules (e.g., digital display units are easier to manufacture, maintain, and repair than traditional mechanical counters).

Innovations and firms' relationships

In this section, we describe the three stages of the development of the dominant design, including the industry evolution, the outcomes in terms of innovation, and the types of relationships that were relied upon. To obtain a better understanding of the dynamic in terms of innovation, we identify for each of the three periods the number of architectural, modular, and incremental innovations (Table 5).

Each of these innovations has been developed by a unique manufacturer seeking to differentiate itself from its competitors. Some have emerged on the market, have been imitated by competitors, and have integrated the dominant design. We have not identified any innovation from projects led by coalitions of manufacturers.

Emergence and era of ferment (1931-1947)

Gottlieb pioneered the industry with the 'Baffle Ball' in 1931, and his success motivated other organizations to imitate his efforts (Colmer, 1976; Ruben, 2018). In the mid-1930s, approximately 150 pinball manufacturers operated in the United States as the industry was emerging, and most of these manufacturers were located in Chicago.

Innovation types. We computed 15 main product innovations in the period, and a majority of them are architectural innovations (60%). This period experienced only one incremental innovation. Actually, the main components were steadily incorporated into the dominant design, and they have rarely been modified afterward. For example, the plunger, which is a spring used to launch the ball, was first used in the 1930s. Similarly, the process called 'Tilt,' which prevents the machine from being raised, was also invented in the 1930s. The following quotation illustrates this point:

> From a pinball standpoint, I said, the basic layout of the playfield should not be radically different from what the original was. [23/1940–1999]

The success of an innovation like the 'Baffle Ball' on the market showed that this industry conveys a competitive advantage to pioneers. Consequently, first entrants into the industry (such as Williams in 1943) sought to discover the best innovations to be launched. Thus, several innovations and product versions were developed without improving industrial processes, which is characteristic of the 'era of ferment,' during which there are a plethora of offerings.

Third parties play a major role in shaping innovations. Hence, operators requested a standardization of pinball machines'

characteristics to facilitate the management of the machine fleet (anti-fraud systems, machine sizes, etc.). Thus, numerous innovations were proposed based on requirements from large operators and clients (owners of game rooms). Pinball tables with legs emerged in the mid-1930s and were incorporated due to solicitation from operators to increase the availability of machines (Jensen, 1979). The design of the 'Tilt' in 1932 stemmed from a requirement from operators who wanted to prevent players from cheating by shaking the machines excessively.

Even though a few main components of pinball were defined during this phase, in 1939, the industry remained unstructured. The American manufacturers were then requisitioned to participate in the war effort, and no dominant design existed.

Types of relationships between manufacturers. The era of ferment is characterized by mostly competitive relationships among manufacturers. We did not find any evidence of cooperation among manufacturers:

> We never went out [with our competitors] to lunch. We never went out at night together. We stayed within our own little company. We never socialized with the employees of the other companies … We never fraternized with other companies. [13/1938]

Furthermore, imitation between competitors is very common. As soon as a firm introduces a novelty on a model, its competitors try to offer it on their own machines. Thus, several companies enter the market with a strategy to imitate the pioneer's efforts (Colmer, 1976). Then, as described in Figure 3, several successful innovations were imitated by most manufacturers on the market and quickly became embedded in the dominant design: coil bumper, disc bumper, lights, plunger, Tilt … The following quotation illustrates this point:

> In those days, everybody was copying everybody else. It was the dog-eat-dog days. One time Jimmy came to about half a dozen of us guys, and he says, 'I'm going to get a game in here at five o'clock. I want you to copy it, but I have to get it out of here before dawn'. So when the game came in, we divide it up. Each one of us got a little section of this game to copy. We built it during the night, and by morning we had a copy of that game before we shipped the other one out at dawn. [13 / 1937]

Simultaneously, manufacturers were aware that they had to establish relationships with third parties to facilitate adoption, as they faced an unfavorable environment. Actually, manufacturers had to address resistance from the puritanical, social, and cultural establishments, and from legal representatives (Ruben, 2018). In the United States, pinball regulation occurred at three levels: federal, state, and local. Pinball bans were implemented in cities such as Washington DC (1936) and New York City (1942). The pinball industry was thought to be controlled by the mafia and to promote illegal gambling, which would lead to corruption.

Selection phase (1947–1970)

The industry continued to experience significant growth after the Second World War. Whereas several product innovations were developed between 1947 and 1970, main options were selected by all manufacturers, and the designs began to converge.

Innovation types. In 1947, the first flipper was designed by Gottlieb for the *Humpty Dumpty* game. This innovation was quickly adopted by the industry, as a player could exercise some control of the ball using this mechanism. As soon as 1948, eight other manufacturers were selling machines that integrated that accessory.

The selection phase witnessed numerous innovations than the other phases (1.39 per year; Table 5). Modular innovations were particularly represented (53.8%). This observation indicates that the overall design of pinball machines was still evolving substantially. However, manufacturers were progressively stabilizing certain components and orienting their efforts into changing modules of the design without transforming the whole concept. A major shift occurred as the enthusiasm of players for new models that offered increasingly more innovations led manufacturers to integrate complex electromechanical components.

Types of relationships. This phase is characterized by coopetitive relationships among manufacturers. Actually, as the industry began to stabilize, employees of the competitive manufacturers developed individual relationships. They knew each other and exchanged key resources such as parts of machines, knowledge and information about the latest games. The following two quotations illustrate this point:

> Forgetting about the very early days in the '30s and '40s, there was much more of a congenial atmosphere. There were, after all, family businesses and the friendly rivalries endured. I still remembered Sam Gensberg being on the phone … calling Bally to get some parts for a new Chicago Coin game. They had run short of something and it wasn't unusual for this type of request to be made by any of the companies. Everybody was willing to give each other a helping hand… [1/1950s–1960s]

> If you look back to what I consider the old days of pinball there was almost a friendly competition between Bally and Williams. In some ways, we helped each other. We would send our latest game over to Williams for evaluation and they would send their games to … There was this place called Round Robin, which was a restaurant more or less in between Chicago Coin, Gottlieb, Bally, and Williams. It was not far from any of them. That seemed to be the pinball meeting place: neutral territory where people would go to have lunch or drink after work … It was a different environment than you would ever see now, or what would be allowed now, with all the non-disclosure agreement and stuff. [27/1965–1970]

As depicted in these two verbatim quotes, the social component of the relationship prevailed over business objectives. In 1951, the US Congress forbade the manufacture, sale, use, ownership, and maintenance of machines that enabled gambling (Colmer, 1976). The primary manufacturers were forced to legitimatize their activities and locate new sale outlets (notably in Europe). The first actions taken by manufacturers involved developing a community to set up their own institution. Harry Williams (founder of Williams Manufacturing) established the *Coin Machine Institute* to educate the public about pinball and demonstrate that it was just an amusement game. Manufacturers also played an active role in the development of the *Coin Machine Industries Inc*., which was a professional association organized to preserve automatic game manufacturers. Furthermore, pinball manufacturers engaged in numerous public relation activities with other associations, such as *The Amusement and Music Operators Association*, which was a lobbying association representing operators. In the 1960s, Gottlieb decided to contract with Rufus King to facilitate the permit of amusement pinball. King was an attorney who also often represented a number of pinball manufacturers (in particular Williams).

Numerous innovations were developed by manufacturers to bypass legal restrictions and to demonstrate that pinball was a game of skill that did not involve gambling. For example, the use of a 'match' bonus feature in pinball games (which allowed a player to win a free game by chance) was not accepted in certain states in the United States because lawmakers associated pinball closely with gambling. In 1960, Gottlieb proposed new pinball machines that allowed skillful players to win extra balls for certain sequences (*Add-a-Ball Pinball,* 1960) and receive extra play time as a result. However, pinball machines were forbidden in most American cities (particularly in New York, Los Angeles, and Chicago) until 1976.

Yet, those relationships were at the same time characterized by fierce competition.

> There was a very strong competition between everybody. It's almost like a sport where you have teammates, but the teammates are also competing against each other. Who can be the fastest? Who can be the most agile? And it was the same in pinball. Everybody wanted to be the best. [27 / 1965–1970]

Thus, the success of a new concept often resulted in an overbid by competitors. For example, in 1962, Williams launched 'Vagabond,' the first pinball machine to use targets that could 'drop.' Because this model was successful, competitors imitated that accessory and widely deployed its usage. The following quotation made by the inventor of those targets who worked at Williams illustrates this situation:

> I had an idea that if I could hit a target and it disappeared, it would be exciting to know that you might have accomplished something unusual. If the target would come up and for whatever reason have some kind of scoring, and when you hit it, it went down. I decided it was a good way to do it with a single target. Gottlieb then came up with 2, 3, 4, 5 and 10 drop targets and they did a terrific job with that feature. [2/1962]

During this phase, intellectual property rights (IPR), human resources control, and secrets were largely used to protect against imitators. However, our historical analysis of primary novelties introduced by manufacturers demonstrates that the appropriability regime was weak. Typically, only a few months passed between the emergence of a successful innovation and its massive (adaptation and) adoption by competitors. There are numerous examples of this same pattern. For example, in August 1968, Williams launched three-inch flippers to replace the standard two-inch flippers. From the 1970s onward, all manufacturers adopted these new dimensions because they were popular with players.

The goal of maintaining a competitive advantage over competitors while cooperating with them leads to paradoxical choices. At Gottlieb, some inventions (like the flipper in 1947) are not patented. Moreover, when competitors violate a patent, no lawsuit is envisaged!

> We were concerned that someone else comes out with a flipper game ahead of us. We wanted to be the first with it. We had a long run of that game. We built 6,500 of that first flipper game. We enjoyed that long run. Then the others copied us. Gottlieb could have patented the flipper but he didn't … There's only one thing that I know for sure he patented, which was my bumper switch … Despite filing for the patent, everybody started using that switch. Didn't Gottlieb go after those violated the patent? No, we just didn't care. Dave was that way; he didn't care. Dave was a gentleman. [13/1947]

Our results indicate that coopetition allows the gradual selection of options and the formation of a dominant design. The cooperative component of relationships enhances the development of the dominant design by facilitating the convergence of what would be accepted as a new pinball. Competition also enhances convergence of options, as it speeds the adoption of successful features.

Era of incremental change (1970–2014)

In 1976, the New York City Council finally allowed pinball games in the city. This ruling set a precedent and allowed for the rapid growth of pinball machines across the United States. Electronic pinball games were introduced in the second half of the 1970s.

Pinball manufacturers continued to experience high turnover in spite of the emergence of video games at the beginning of the 1980s. However, that time period ultimately led to the decline of the pinball machine industry.

Innovation types. This period is characterized by the lowest number of innovations (0.27 per year; Table 5). Modular innovations and incremental innovations by far outnumbered architectural innovations (83.3% vs. 16.7%; Table 5). No architectural innovation integrates the dominant design. This demonstrates that the design is stabilized, and innovations mainly aim at reinforcing it. It also highlights the inability of manufacturers to radically reconsider previous choices to face new challenges, such as competition from the video game industry.

Types of relationships. Since 1976, pinball has been legal in the United States. Manufacturers can therefore benefit from a strong growth in their domestic market. They develop skills in electronics and increase their efforts to protect their innovations. During this phase, intellectual property rights (IPR), human resources control and secretive ways are still largely used to protect against imitators (see Table 4). Table 6 presents the distribution of patents filed by manufacturers since 1976. Even in this 'incremental change' phase, there is a significant use of patent filing. Williams seems to be filing significantly more patents than its competitors. Notably, however, 38 patents were filed by this manufacturer between 1995 and 1999 and concern the 'Pinball 2000 project' (machine combining pinball and video).

These patent filings sometimes resulted in lawsuits between competitors:

> Are you familiar with the lawsuit that Bally had against Gottlieb? … Along the way, Bally took a look at our system. I suppose Williams joined in on it, but I think Bally was the big one. They sued us for infringement on their electronic design. I was involved a lot in the deposition processes in which the lawyers wanted to pick our brains and find out whether there were any grounds for which Bally could sue us and make us penalties, royalties, or whatever. [31/1980]

Manufacturers also competed for contracts with renowned designers. Many of these designers were considered key resources, and manufacturers attempted to control the flow of information (see Table 4 for an illustration).

Table 6. Distribution of patents filed by manufacturer since 1976

Manufacturer	Period	Number of patents
Bally	1976→1988	19 (1.6 per year)
Gottlieb	1979→1994	22 (1.5 per year)
Williams	1979→1999	88 (4.4 per year)

N.B. It was not possible to retrace the exhaustive list of patents filed by pinball manufacturers before 1976.

However, our analysis demonstrates that the appropriability regime is still weak during this phase. The case of the 'Xenon' pinball machine, which was launched in December 1980 by Bally, is particularly informative. This machine included numerous innovations that were successful at the beginning of the 1980s: multi-level playfield, multi-ball game, and digital voices. The development of this model shows that manufacturers closely monitored the activities of their competitors to detect novelties and integrate them, even if it meant altering current projects. The following comments by a project manager describe this environment:

> Bally's marketing department had heard of a competitor's talking game ... The decision was made to one-up the competition by utilizing a female's voice, as dictated by the artwork … So now Bally had a game with a multi-level playfield, great artwork and great sounds. Then, Bally's marketing department heard that a multi-ball game was planned for release by a competitor. Well, Bally couldn't be beaten at their own game of one-upmanship. Bally wanted to sell a multi-ball game also ... Within hours, Xenon was transformed into a multi-ball game. [5 / 1979]

Two factors limited the IPR. Certain design choices could not be protected, and retro-engineering practices that could bypass patents were widespread. For example, in 1990, the Japanese arcade game manufacturer Data East first introduced the electronic pinball machine with the *Robocop* model. Thus, Data East was a new entrant in the sector (it had first proposed the model in 1987). Data East expected to benefit from its competences in electronics to develop innovative models. However, Williams bypassed the patent and launched a similar innovation on its own machines in 1992. The following quotations illustrate the role of retro-engineering practices and the difficulties in patenting certain mechanisms:

> No, no, in fact almost everything that I itemized had some type of patent protection, some type of design protection, so it wasn't as if Game Plan could automatically go to the vendor who was supplying flippers to Gottlieb and say: "Hi, we would like to order flippers as well." It was a question of really going back and doing, I guess for lack of a better word to describe it, development from the ground up … The way that the housing underneath was, what the mechanical parts were in terms of bracketing and so on, had to be somewhat unique. [1/1977]

> [This mechanism] was a good feature. It was cool. But we were never able to patent it because of the language in the patent application. There was a lot of prior act, other features in other games, other mechanisms that were already patented. Many features were similar to this game in how they worded, not how they operated and so we couldn't be granted a patent. We tried twice and were denied twice. [28/1987]

This weak appropriability regime prompted Gottlieb to waive patents during the 1970s, as shown in the following quote[2]:

> "All the manufacturers were keenly aware of what the others were doing in the industry because we were all trying to produce a product that would catch the fancy of the players and make more money." Dave Gottlieb didn't pursue the patent track to get exclusive use of any of his company's developments. He felt that as long as he got the first benefits of an idea, he didn't mind others copying it. His favourite quotation on that was "Imitation is the most sincere form of flattery." [Alvin Gottlieb, in Shalhoub, 2004, p. 21/1970s]

At the same time, manufacturers continue to cooperate during this phase, at least until the mid-1990s. They sought to collectively answer operators' solicitations to enhance their ability to maintain and repair machines (spare parts that were common to several models, standardization of maintenance processes, etc.).

> I was working on games simultaneously for a couple of different, competitive companies. But everybody knew they could trust me. I was going to give them feedback that was open and honest … For commercial operation, one of the keys concerns is "If I need a replacement part, where do I get it from?" … I produced an amazing amount of mailings highlighting upcoming games, giving that operator/location owner whatever type of information was necessary and important such as how to operate and set up their games … By the same token there were different times, where many personal relationships became prioritized over professional secrecy, and maybe some things were shared in a way that they shouldn't have been. The net result was that you saw some striking similarities between competitive products at various points in time. It's a very fine line to tread. [1 / 1970s–1980s]

From the mid-1990s onward, relationships between manufacturers and operators deteriorated. Operators experienced a strong drop in demand from players and tried to renew their offerings by introducing electronic games suppliers (notably Japanese suppliers). For several decades, the relationships between operators and manufacturers were quite balanced because the former had key resources but no alternative suppliers for machines. However, the advent of video games considerably decreased the power of pinball manufacturers. Since the development of video games, pinball manufacturers had only one ambition: to regain the operators' confidence by proposing machines that better suited their requirements. Digital voices were added to enhance the attractiveness of pinball machines in arcade rooms. Certain manufacturers changed the size of their machines to become more similar to the video game console in arcade rooms (e.g., Williams with the 'Pinball Circus' prototype in 1994). Other manufacturers increasingly used animated characters or proposed models inspired by Foosbal or Bowling (e.g., 'Strikes n' Spares' from Gottlieb in 1995). Conversely, certain innovations promoted by manufacturers failed to achieve success in the market due to a lack of support from operators. The following two quotations illustrate this point:

> The thing that most people don't understand about our business is that these are money-making devices. Their primary function is to make money for the operator. We don't just build things for players; we build things for a whole chain of command … The operators in our business have a long memory. When you show them something (like this), they will say, "that has been tried before. It didn't make me a whole lot of money, why is it going to make me money now?" [16/1980–2010]

> I thought that pinball machine cabinets had not changed in fifty years, or however long they had been around, and I wanted to design a new, modern, contemporary cabinet for pinball games … I put the cabinet on a pedestal (there were no legs) to help it look more contemporary and modern… [But] operators did not care about cabinet designs; they just wanted to know how much money the game took in. It was hard to justify spending money on the cabinet. [9/1979]

Williams attempted alone to design models that integrated videos ('Pinball 2000'). In its latest projects, Williams was obsessed with secrecy at a level that had not previously been observed in the industry (Maletic, 2010).

> Secrecy was critical to ensuring that Revenge from Mars make as big a splash as possible when it hit the market. Williams also wanted to keep their plans secret from their competitors to keep them from copying the new design. Williams even farmed out parts to multiple suppliers so that no one vendor saw more than a single piece of the puzzle. [23 / 1998–1999]

Those numerous examples demonstrate a lack of cooperation among manufacturers, which were attempting to individually find solutions to market decline. Relationships with third parties were also harmed. The necessity of maintaining good relationships with operators enticed manufacturers to invest in the development of new functionalities, in spite of the potential for such advances to damage the value proposition for others. Actually, numerous product innovations disturbed small operators (maintenance requiring new skills), location owners (revenue uncertainty generated by a radically new machine), and players (rules were increasingly specific to each machine). The following two quotations illustrate this point:

> Let's accept the fact that if an operator or location owner needed to change a light bulb but there was a ramp with ten screws

[2] In the early 1970s, health problems forced David Gottlieb to stop working. He died in 1974. Obviously, his successors at the head of the company resumed the filing of patents as shown in Table 6.

needing to be loosened, that it became counter-productive to operate pinball machines… [1 / late 90s]

Pinball lost a market of players because of their technologically enhanced games. The machines went a little haywire with their toys and all the different things they felt had to be on a game. [20/1990–2000]

Our historical analysis demonstrates that the relationships among the five manufacturers have been based on coopetition since the mid-1940s. Manufacturers were simultaneously competing while cooperating. The need to differentiate products to sell pinball machines to operators led manufacturers to innovate and quickly imitate successful competitors, which in turn amplified competition. Simultaneously, cooperation resulted from the necessity to address common threats and collectively respond to customer and partner demands.

Consequently, the two necessary conditions to qualify a situation as coopetitive are present: competition and cooperation occur concurrently (simultaneity criteria), and firms maintain relationships based on horizontal competition (rivalry criteria). Figure 4 summarizes the key points of the results and presents the different phases of the process.

Discussion

This section addresses the contributions of this research to the literature on dominant design and proposes a discussion of the results obtained from the historical analysis concerning absorptive capacity and appropriability regime. Finally, we develop some implications for managers.

Contributions to the literature on dominant design

The analysis of the history of the pinball machine industry demonstrates that in specific contexts, characterized by external threats and a high level of power of third parties, the dominant design is neither imposed by a single organization nor emergent from a collective strategy.

Competition and collaboration occurred simultaneously and on a single level of the value chain. To better comprehend that specificity, we use the image of cake-sharing from Nalebuff, Brandenburger, and Maulana (1996).

In a situation of coopetition, a firm competes successfully for its slice of the 'added value cake' and simultaneously seeks to ensure that the cake grows larger. In most studies regarding technological development and standard warfare, firms agree

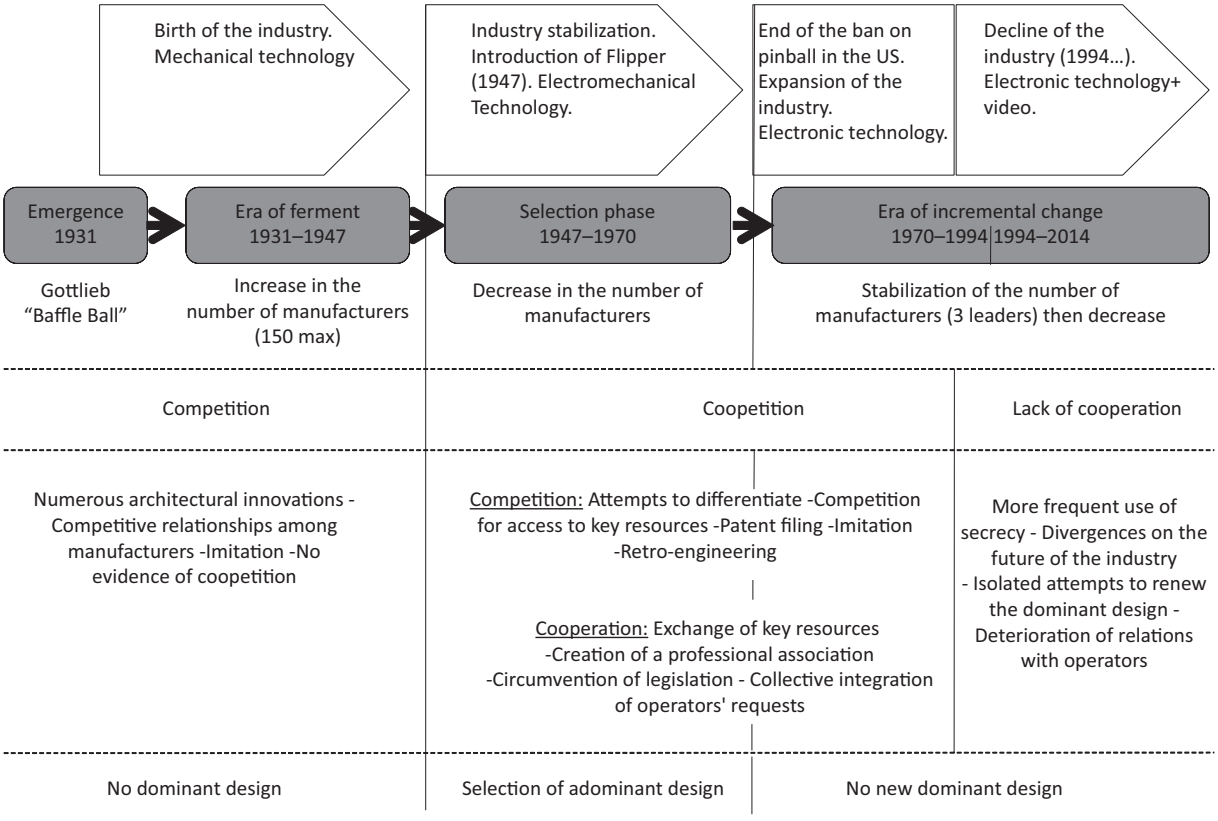


Figure 4. The development of a dominant design in the pinball industry: a synthesis

on the cake recipe (in t0) and then attempt to obtain the largest slice of cake (in t1). In particular, studies have demonstrated that the emergence of a standard can result from co-integration alliances (Dussauge & Garrette, 1999) that are created by firms to define technical specifications and that allow for competition as the product is distributed (Rosenbloom & Cusumano, 1987; Shibata, 1993). However, if the simultaneity criterion is considered, those agreements are not fully based on coopetition. In the pinball machine industry case, certain competitive companies operated in isolation to define the best recipe. Thus, these organizations integrated new ingredients (innovations) and simultaneously learned from competitors' ideas. This process – which includes imitation and innovation – resulted in a 'unique recipe,' which was collectively conceptualized from individual efforts.

The literature concerning dominant designs focuses on either 'competitive' or 'collective' strategies. In this research, we demonstrate that using only these two relational logics to understand firm actions is insufficient. Firms can cooperate and compete simultaneously to impose a dominant design. This is a significant contribution. To the best of our knowledge, very few researchers have analyzed the consequences of coopetitive relationships in the context of the formation of a dominant design. Prior studies have demonstrated that the need to develop product compatibility often results in coopetitive behaviors, specifically when there are network externalities (Ritala, 2012; Yami & Nemeh, 2014). However, these prior studies have frequently defined coopetition as an alliance among competitors, which is a (perhaps overly) broad definition. Thus, it is impossible to check whether the situations studied respect the simultaneity criteria.

Those relationships impact innovative output. Thus, throughout the technological cycle, four types of innovation can be distinguished (Henderson & Clark, 1990). The characteristics of innovation depend on the phase in which it is anchored (Abernathy & Clark, 1978; Tushman & Murmann, 1998; Murmann & Frenken, 2006). By identifying coopetitive relationships during this cycle, our historical perspective allows renewing analysis of the influence of coopetition on innovation. The impact of coopetition on innovation remains controversial (Fernandez et al., 2018). Previous scholars found a positive, neutral, or negative impact of coopetition on product innovation (Arranz & Arroyabe, 2008; Gnyawali & Park, 2009, 2011; Nieto & Santamaría, 2007; Santamaria & Surroca, 2011; Ritala & Hurmelinna-Laukkanen, 2009). Recent studies, including radicalness as a moderated variable, also obtained mixed results (Bouncken & Fredrich, 2012; Bouncken, Fredrich, Ritala, & Kraus, 2017; Jakobsen & Steinmo, 2016; Ritala, 2012; Yami & Nemeh, 2014). However, those works do not contextualize innovations into the different phases of technological development in which they may occur.

During the first phase of pinball development (era of ferment, 1930–1947), no coopetitive behaviors were identified. The second phase of selection (1947–1970) was characterized by a balanced coopetition (Bengtsson & Kock, 2000; Yami, Chappert, & Mione, 2015) and led to numerous architectural and modular innovations (84.4%; Table 5). During that period, the number of innovations was the highest (1.39 per year). After the selection of the dominant design (Era of incremental change, 1970–2014), the number of architectural innovations decreased significantly (16.7%), whereas the number of incremental innovations increased significantly (33.3%). The number of innovations per year was the lowest (0.27 per year). Those results are coherent with Anderson and Tushman's (1990) as well as Murmann and Frenken's (2006) work: the industry entered a phase of incremental changes, which did not challenge the design but reinforced it.

From the 90s onward, relationships among manufacturers worsened. Competitive coopetition (Bengtsson & Kock, 2000; Yami et al., 2015) was the predominant mode of strategic behaviors. No architectural innovation was incorporated into the dominant design. Individual attempts to renew the design emerged but none succeeded (Table 5). Thus, our findings contribute to the debate on the impact of coopetition on innovation. We show that coopetition can be fruitful for incremental, modular, and architectural innovations. However, coopetition does not entice actors to introduce a disruption to change the dominant design. In the case that we studied, actors were trapped in the dominant design and tried to improve it with competitive technologies but did not manage to create a radically new design.

Absorptive capacity and appropriability regime: Lessons from the historical analysis

In the dominant design literature, the results of the strategic maneuvers depend on the appropriability regime (Teece, 1986) and the absorptive capacity (Cohen & Levinthal, 1990). In a context of coopetition, the firm's ability to acquire knowledge from external sources and to protect its innovations against imitation is relevant in increasing the innovation outcomes of collaborating with its competitors (Ritala & Hurmelinna-Laukhanen, 2013).

In our study, the ability of manufacturers to regularly and quickly integrate new technologies (mechanical, electrical, electronic, digital, and video technologies) to strengthen the dominant design demonstrates a strong absorptive capacity. However, this study highlighted that the pinball machine industry was characterized by a weak appropriability regime (e.g., difficulty protecting design components, patent infringements, and non-exclusivity of key resources, such as designers). Hurmelinna-Laukkanen and Puumalainen (2007) differentiate among five main mechanisms to strengthen the appropriability regime. However, in the studied case, those mechanisms did not successfully lead to value appropriation. Tacit knowledge

was difficult to protect as several key individuals (particularly designers) regularly changed employers or were working simultaneously for several manufacturers. Mechanisms of institutional protection (more particularly patents) provided a weak protection as shown by short imitation delays. Exclusive exploitation licenses (with movie theaters, music stars…) were signed. However, as plenty of licenses were agreed upon, they did not represent a scarce asset. As each manufacturer imposed a worldwide renowned brand, none of them managed to gain a competitive advantage. Human resource management did not permit the protection of key human assets. Technical protection tools (passwords, specific protocols…) were not broadly used as operators imposed standardization (such as operating instructions, maintenance, and stocks of spare parts). Finally, the continuous development of new products to take advantage of a time-based advantage provided deceptive results. The imitation timeframe was often short due to retro-engineering practices.

Thus, our results are not consistent with the findings of Ritala and Hurmelinna-Laukkanen (2013), who analyzed absorptive capacity in a coopetitive environment and identified the positive impact of a high appropriability regime, which is not present in our research.

In spite of a weak appropriability regime, pinball machine manufacturers benefitted from coopetitive relationships. American manufacturers that existed in the mid-1940s experienced steady growth and became worldwide leaders. European manufacturers (the Italian Zaccaria and the Spanish Recel) remained marginal participants in the industry, although they had access to a substantial domestic market. Even the Japanese manufacturers, Data East and Sega, which were leading innovators in electronic technology development, did not challenge the Chicago manufacturers' competitive positions. Consequently, coopetitive relationships allowed market development, innovation, and economic performance over a long time period, and protection against common rivals. These observations align with the conclusions of Ritala (2012).

However, in the literature focusing on the development of innovation through coopetitive relationships, most researchers identify formal agreements between firms. These agreements usually lead to the creation of joint ventures and joint patents (Gnyawali & Park, 2011). One of the key success factors is the identification of the right structure to achieving common innovation projects (Fernandez et al., 2018). In the Pinball industry, the coopetitive relationships were developed without a formal agreement among the manufacturers and implementation of intermediation structures. Studies in other contexts should be conducted to assess the scope of this result.

However, from the perspective of pinball machine manufacturers, the 1990s were characterized by a decline in interest and an increase in competitive behaviors. Thus, the nature of coopetitive relationships changed (Sanou, Le Roy, & Gnyawali, 2016), and this had impact at the industry level. Actually, renewed efforts were undertaken in multiple directions but were less concerted and deliberate. Thus, our analysis demonstrates that as relationships became more competitive, the situation for all pinball machine manufacturers deteriorated. As long as coopetitive relationships were maintained, manufacturers were able to grow. Thus, as described by Bengtsson and Raza-Ullah (2016), we considered coopetition as a continuum between purely competitive and cooperative relationships. Whereas during the first periods of our study, actors had aligned their expectations and focused on legitimizing and increasing the adoption of their activity, during the last period, they had a different set of expectations. The rules and goals of competition were reformulated (Dorn et al., 2016), which eroded the overall benefits that actors could draw from their relationships. However, this observation should be tested in other contexts because we cannot assess whether more-coopetitive relationships would have enabled the pinball machine manufacturers to survive.

Conclusion

The aim of this research was to contribute to the current literature regarding the development of a dominant design using the coopetition framework to obtain an improved understanding of the interplay among actors engaged in this development. We identify how coopetitive relationships may lead to the development of a dominant design. Our historical analysis regarding the development of a dominant design in the pinball machine industry details the characteristics of that dominant design (which occurred from the 1970s onward) and demonstrates that it results from a coopetitive process. Because manufacturers differentiated their offerings, innovated, and simultaneously imitated others, increased competition resulted. Simultaneously, external threats and the need to collectively respond to clients and partners prompted the manufacturers to cooperate with one another.

Our study shows that firms might benefit from collaborating with competitors to create a dominant design, even with a weak appropriability regime. Thus, this case study suggests that as a theoretical framework, coopetition allows for the development of new perspectives for research regarding technological cycles, particularly with respect to the selection of dominant designs. Our observations also confirm or invalidate conclusions from previous works on coopetition strategies.

However, numerous questions remain. First, the observed industry has specificities that may limit the generalization of our results. These limitations include the requirement for participants to legitimize their activity and a weak appropriability regime. Studies in other contexts should be conducted to assess the scope of our results. Furthermore, our historical

method did not allow us to study in detail how firms manage and organize their relationships (e.g., how pinball manufacturers and their managers dealt with antagonistic relationships). Certain authors have demonstrated that coopetition has an impact on organizational arrangements and on project structures (Bengtsson & Kock, 2000; Fernandez et al., 2018). Our *a posteriori* analysis did not allow us to produce results regarding 'coopetition management' (Le Roy, Fernandez, & Chiambaretto, 2019). Future research may investigate these specific aspects of coopetition.

References

Abernathy, W. J. & Utterback, J. M. (1978). Patterns of industrial innovation. *Technology Review, 80*(7), 40–47.

Akrich, M., Callon, M., Latour, B. & Monaghan, A. (2002a). The key to success in innovation Part I: The art of interessement. *International Journal of Innovation Management, 6*(2), 187–206. doi: 10.1142/S1363919602000550

Akrich, M., Callon, M., Latour, B. & Monaghan, A. (2002b). The key to success in innovation part II: The art of choosing good spokespersons. *International Journal of Innovation Management, 6*(2), 207–225. doi: 10.1142/s1363919602000562

Anderson, P. & Tushman, M. L. (1990). Technological discontinuities and dominant designs: A cyclical model of technological change. *Administrative Science Quarterly, 35*, 604–633. doi: 10.2307/2393511

Arranz, N. & Arroyabe, J. C. (2008). The choice of partners in R&D cooperation: An empirical analysis of Spanish firms. *Technovation, 28*, 88–100. doi: 10.1016/j.technovation.2007.07.006

Arthur, W. B. (1989). Competing technologies, increasing returns, and lock-in by historical events. *The Economic Journal, 99*(394), 116–131. doi: 10.2307/2234208

Astley, G. & Fombrun, C. J. (1983). Collective strategy: Social ecology of organizational environments. *Academy of Management Review, 8*(4), 576–587. doi: 10.5465/amr.1983.4284657

Batson, B. J. & Bellgraph, B. B. (2008). *Pinball passion*. Playfield Productions.

Bengtsson, M. & Kock, S. (2000). 'Coopetition' in business networks – To cooperate and compete simultaneously. *Industrial Marketing Management, 29*(5), 411–426. doi: 10.1016/s0019-8501(99)00067-x

Bengtsson, M. & Kock, S. (2014). Coopetition – Quo vadis? Past accomplishments and future challenges. *Industrial Marketing Management, 43*(2), 180–188. doi: 10.1016/j.indmarman.2014.02.015

Bengtsson, M., Kock, S. & Lundgren-Henriksson, E.-L. (2019). Coopetition research. Rooting and future agendas. In A.-S. Fernandez, P. Chiambaretto, F. Le Roy & W. Czakon (Eds.), *The Routledge companion to coopetition strategies* (pp. 13–22). Abingdon: Routledge. doi: 10.4324/9781315185644-2

Bengtsson, M. & Raza-Ullah, T. (2016). A systematic review of research on coopetition: Toward a multilevel understanding. *Industrial Marketing Management, 57*, 23–39. doi: 10.1016/j.indmarman.2016.05.003

Bijker, W. E., Hughes, T. P. & Pinch, T. (Eds.). (1989). *The social construction of technological systems, new directions in the sociology and history of technology*. Cambridge, MA: MIT Press. doi: 10.1017/s0025727300049516

Bouncken, R. B. & Fredrich, V. (2012). Coopetition: Performance implications and management antecedents. *International Journal of Innovation Management, 16*(5), 1250028, 1–28. doi: 10.1142/s1363919612500284

Bouncken, R. B., Fredrich, V., Ritala, P. & Kraus, S. (2017). Coopetition in new product development alliances: Advantages and tensions for incremental and radical innovation. *British Journal of Management, 29*(3), 391–410. doi: 10.1111/1467-8551.12213

Bouncken, R. B., Gast, J., Kraus, S. & Bogers, M. (2015). Coopetition: A systematic review, synthesis, and future research directions. *Review of Managerial Science, 9*(3), 577–601. doi: 10.1007/s11846-015-0168-6

Brandenburger, A. M. & Nalebuff, B. J. (1995, July–August). The right game: Use game theory to shape strategy. *Harvard Business Review*, pp. 57–71. doi: 10.1016/0024-6301(95)90326-7

Castaldo, S., Möellering, G., Grosso, M. & Zerbini, F. (2010). Exploring how third-party organizations facilitate coopetition management in buyer-seller relationships. In S. Yami, S. Castaldo, B. Dagnino & F. Le Roy (Eds.), *Coopetition: Winning strategies for the 21st century* (pp. 141–165). Cheltenham: Edward Elgar Publishing. doi: 10.4337/9781849807241.00016

Cecere, G., Corrocher, N. & Battaglia, R. D. (2015). Innovation and competition in the smartphone industry: Is there a dominant design? *Telecommunications Policy, 39*(3–4), 162–175. doi: 10.1016/j.telpol.2014.07.002

Chabaud, D. & Germain, O. (2006). Re-using qualitative data in management science: A second choice? *M@n@gement, 9*(3), 191–213. doi: 10.3917/mana.093.0199

Chiambaretto, P. & Dumez, H. (2012). The role of bundling in firms' marketing strategies: A synthesis. *Recherche et Applications en Marketing, 27*(2), 91–105. doi: 10.1177/205157071202700205

Chiambaretto, P. & Rigaud, E. (2013). Coopétition, hétérogénéité des consommateurs et stratégies de ciblage. *Journal of Social Management/Revue Européenne des Sciences Sociales et du Mangement, 11*, 98–131.

Choi, P., Garcia, R. & Friedrich, C. (2009). The drivers for collective horizontal coopetition: A case study of screwcap initiatives in the international wine industry. *International Journal of Strategic Business Alliances, 1*(3), 271–290. doi: 10.1504/ijsba.2010.030427

Christensen, C. M., Suárez, F. F. & Utterback, J. M. (1998). Strategies for survival in fast-changing industries. *Management Science, 44*(12-part 2), S207–S220. doi: 10.1287/mnsc.44.12.s207

Cohen, W. M. & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*(1), 128–152. doi: 10.2307/2393553

Colmer, M. (1976). *Pinball an illustrated history*. New York, NY: New American Library.

Cusumano, M. A., Mylonadis, Y. & Rosenbloom, R. S. (1992). Strategic maneuvering and mass-market dynamics: The triumph of VHS over beta. *Business History Review, 66*(1), 51–94. doi: 10.2307/3117053

Czakon, W. & Czernek-Marszatek, K. (2019). Trust in tourism dyadic and network coopetion. In A.-S. Fernandez, P. Chiambaretto, F. Le Roy & W. Czakon (Eds.), *The Routledge companion to coopetition strategies* (pp. 83–92). Abingdon: Routledge. doi: 10.4324/9781315185644-8

Czakon, W. & Dana, L. P. (2013). Coopetition at work: How firms shaped the airline industry. *Journal of Social Management, 11*(2), 32–61.

Depeyre, C. & Dumez, H. (2010). The role of architectural players in coopetition: The case of the US defense industry. In S. Yami, S. Castaldo, B. Dagnino & F. Le Roy (Eds.), *Coopetition: Winning strategies for the 21st century* (pp. 124–141). Cheltenham: Edward Elgar Publishing. doi: 10.4337/9781849807241.00015

Dorn, S., Schweiger, B. & Albers, S. (2016). Levels, phases and themes of coopetition: A systematic literature review and research agenda. *European Management Journal, 34*(5), 484–500. doi: 10.1016/j.emj.2016.02.009

Dussauge, P. & Garrette, B (1999). *Cooperative Strategy*. Competing Successfully through Strategic Alliances. Chichester: Wiley.

Dyer, J. H. & Singh, H. (1998). The relational view: Cooperative strategy and sources of inter-organizational competitive advantage. *Academy of Management Review, 23*(4), 660–679. doi: 10.5465/amr.1998.1255632

Ehrhardt, M. (2004). Network effects, standardization and competitive strategy: How companies influence the emergence of dominant designs. *International Journal of Technology Management, 27*(2–3), 272–294. doi: 10.1504/ijtm.2004.003956

Fernandez, A.-S., Le Roy, F. & Chiambaretto, P. (2018). Implementing the right project structure to achieve coopetitive innovation projects. *Long Range Planning, 51*(2), 384–405. doi: 10.1016/j.lrp.2017.07.009

Fernandez, A.-S., Le Roy, F. & Gnyawali, D. R. (2014). Sources and management of tension in co-opetition case evidence from telecommunications satellites manufacturing in Europe. *Industrial Marketing Management, 43*(2), 222–235. doi: 10.1016/j.indmarman.2013.11.004

Fernández, E. & Valle, S. (2019). Battle for dominant design: A decision-making model. *European Research on Management and Business Economics, 25*(2), 72–78. doi: 10.1016/j.iedeen.2019.01.002

Funk, J. L. (2003). Standards, dominant designs and preferential acquisition of complementary assets through slight information advantages. *Research Policy, 32*(8), 1325–1341. doi: 10.1016/s0048-7333(02)00121-x

Garud, R. & Karnøe, P. (2003). Bricolage versus breakthrough: Distributed and embedded agency in technology entrepreneurship. *Research Policy, 32*(2), 277–300. doi: 10.1016/s0048-7333(02)00100-2

Garud, R., Jain, S. & Kumaraswamy, A. (2002). Institutional entrepreneurship in the sponsorship of common technological standards: The case of Sun Microsystems and Java, *Academy of Management Journal, 45*(1), 196–214. doi: 10.2307/3069292

Geroski, P. A. (1995). What do we know about entry? *International Journal of Industrial Organization, 13*, 421–440. doi: 10.1016/0167-7187(95)00498-x

Glaser, B. & Strauss, A. (1967). *The discovery of grounded theory. Strategies for qualitative research*. Chicago, IL: Aldine Publishing Company. doi: 10.1007/978-3-658-13213-2_59

Gnyawali, D. R. & Park, B. J. R. (2009). Co-opetition and technological innovation in small and medium-sized enterprises: A multilevel conceptual model. *Journal of Small Business Management, 47*(3), 308–330. doi: 10.1111/j.1540-627x.2009.00273

Gnyawali, D. R. & Park, B. J. R. (2011). Co-opetition between giants: Collaboration with competitors for technological innovation. *Research Policy, 40*(5), 650–663. doi: 10.1016/j.respol.2011.01.009

Gnyawali, D. R. & Ryan Charleton, T. (2018). Nuances in the interplay of competition and cooperation: Towards a theory of coopetition. *Journal of Management, 44*(7), 2511–2534. doi: 10.1177/0149206318788945

Gnyawali, D. R. & Song, Y. (2016). Pursuit of rigor in research: Illustration from coopetition literature. *Industrial Marketing Management, 57*, 12–22. doi: 10.1016/j.indmarman.2016.05.004

Hamouti, R., Robert, F. & Le Roy, F. (2014). Individual strategy, vertical cooperation or coopetition strategy: What is the best strategy for product innovation? *Innovations, 1*(43), 135–161. doi: 10.3917/inno.043.0135

Heaton, J. (2004). *Reworking qualitative data*. Thousand Oaks, CA: Sage.

Hekkert, M. & van den Hoed, R. (2004). Competing technologies and the struggle towards a new dominant design. *Greener Management International, 47*, 29–43. doi: 10.9774/gleaf.3062.2004.au.00005

Helms, M., Cook, H. & Fisher, D. (1997). *Pleasure machine, the history of pinball*. New Video Images.

Henderson, R. M. & Clark, K. B. (1990). Architectural innovation: The reconfiguration of existing product technologies and failure of established firms. *Administrative Science Quarterly, 35*(1), 9–30. doi: 10.2307/2393549

Huberman, A. M. & Miles, M. B. (2002). *The qualitative researcher's companion*. Thousand Oaks, CA: Sage. doi: 10.4135/9781412986274

Huhtamo, E. (2005). Slots of fun, slots of trouble. An archaeology of arcade gaming. In J. Raessens & J. Goldstein (Eds.), *Handbook of computer games studies* (pp. 3–21). Cambridge, MA: The MIT Press. doi: 10.1162/leon.2007.40.2.207

Hurmelinna-Laukkanen, P. & Puumalainen, K. (2007). Nature and dynamics of appropriability: Strategies for appropriating returns on innovation. *R&D Management, 37*(2), 95–112. doi: 10.1111/j.1467-9310.2007.00460.x

Jakobsen, S. & Steinmo, M. (2016). The role of proximity dimensions in the development of innovations in coopetition: A longitudinal case study. *International Journal of Technology Management, 71*(1/2), 100–122. doi: 10.1504/ijtm.2016.077976

Jensen, R. (1979). What is Pinball? *Amusement Review*, 2, 3–4.

Joosten, J. (Ed.). (2012). *Pinball Magazine*, 1. Utrecht: Unigroove Publishing.

Joosten, J. (Ed.). (2013). *Pinball Magazine*, 2. Utrecht: Unigroove Publishing.

Joosten, J. (Ed.). (2014). *Pinball Magazine*, Special Issue. Utrecht: Unigroove Publishing.

Joosten, J. (Ed.). (2015). *Pinball Magazine*, 3. Utrecht: Unigroove Publishing.

Joosten, J. (Ed.). (2016). *Pinball Magazine*, 4. Utrecht: Unigroove Publishing.

Joosten, J. (Ed.). (2018). *Pinball Magazine*, 5. Utrecht: Unigroove Publishing.

Katz, M. L. & Shapiro, C. (1985). Network externalities, competition, and compatibility. *The American Economic Review, 75*(3), 424–440. https://www.jstor.org/stable/181480

King, J. L., Gurbaxani, V., Kraemer, K. L., McFarlan, F. W., Raman, K. S. & Yap, C. S. (1994). Institutional factors in information technology innovation. *Information Systems Research, 5*(2), 139–169. doi: 10.1287/isre.5.2.139

Klepper, S. (1996). Entry, exit, growth, and innovation over the product life cycle. *The American Economic Review, 86*(3), 562–583.

Klymas, P. (2019). Organizational culture models of coopetitors. In A.-S. Fernandez, P. Chiambaretto, F. Le Roy & W. Czakon (Eds.), *The Routledge companion to coopetition strategies* (pp. 117–127). Abingdon: Routledge. doi: 10.4324/9781315185644-11

Kœnig, G. (2004). *Management stratégique. Projets, interactions & contextes*. Paris: Dunod.

Lee, G. K. (2007). The significance of network resources in the race to enter emerging product markets: The convergence of telephony communications and computer networking, 1989–2001. *Strategic Management Journal, 28*(1), 17–37. doi: 10.1002/smj.566

Liebowitz, S. J. & Margolis, S. E. (1995). Path dependence, lock-in, and history. *Journal of Law, Economics, & Organization, 11*(1), 205–226. doi: 10.2139/ssrn.1706450

Le Roy, F., Fernandez, A.-S. & Chiambaretto, P. (2019). From strategizing coopetition to managing coopetition. In A.-S. Fernandez, P. Chiambaretto, F. Le Roy & W. Czakon (Eds.), *The Routledge companion to coopetition strategies* (pp. 36–46). Abingdon: Routledge. doi: 10.4324/9781315185644-4

Maletic, G. (2010). *Tilt, the battle to save pinball, the future of pinball*. LLC.

March, J. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*(1), 71–87. doi: 10.1287/orsc.2.1.71

Mariani, M. (2019). The role of policy makers and regulators in coopetition. In A.-S. Fernandez, P. Chiambaretto, F. Le Roy & W. Czakon (Eds.), *The Routledge companion to coopetition strategies* (pp. 105–116). Abingdon: Routledge. doi: 10.4324/9781315185644-10

Mione, A. (2009). When entrepreneurship requires coopetition: The need for standards in the creation of a market. *International Journal of Entrepreneurship and Small Business, 8*(1), 92–109. doi: 10.1504/ijesb.2009.024107

Murmann, J. P. & Frenken, K. (2006). Toward a systematic framework for research on dominant designs, technological innovations, and industrial change. *Research Policy, 35*, 925–952. doi: 10.1016/j.respol.2006.04.011

Nalebuff, B. J., Brandenburger, A. & Maulana, A. (1996). *Co-opetition*. London: Harper Collins Business.

Nieto, M. J. & Santamaría, L. (2007). The importance of diverse collaborative networks for the novelty of product innovation. *Technovation, 27*(6), 367–377. doi: 10.1016/j.technovation.2006.10.001

Peng, T. J. A., Yen, M. H. & Bourne, M. (2018). How rival partners compete based on cooperation? *Long Range Planning, 51*(2), 351–383. doi: 10.1016/j.lrp.2017.10.003

Ritala, P. (2012). Coopetition strategy – When is it successful? Empirical evidence on innovation and market performance. *British Journal of Management, 23*, 307–324. doi: 10.1111/j.1467-8551.2011.00741.x

Ritala, P. & Hurmelinna-Laukkanen, P. (2009). What's in it for me? Creating and appropriating value in innovation-related coopetition. *Technovation, 29*(12), 819–828. doi: 10.1016/j.technovation.2009.07.002

Ritala, P. & Hurmelinna-Laukhanen, P. (2013). Incremental and radical innovation in coopetition – The role of absorptive capacity and appropriability. *Journal of Product Innovation Management, 30*(1), 154–169. doi: 10.1111/j.1540-5885.2012.00956.x

Ritala, P., Kraus, S. & Bouncken, R. B. (2016). Introduction to coopetition and innovation: Contemporary topics and future research opportunities. *International Journal of Technology Management, 71*(1–2), 1–9. doi: 10.1504/IJTM.2016.077985

Ritala, P. & Sainio, L. M. (2014). Coopetition for radical innovation: Technology, market and business-model perspectives. *Technology Analysis & Strategic Management, 26*(2), 155–169. doi: 10.1080/09537325.2013.850476

Ritala, P. & Tidström, A. (2014). Untangling the value-creation and value-appropriation elements of coopetition strategy: A longitudinal analysis on the firm and relational levels. *Scandinavian Journal of Management, 30*(4), 498–515. doi: 10.1016/j.scaman.2014.05.002

Rosenbloom, R. & Cusumano, M. (1987). Technological pioneering and competitive advantage: The birth of the VCR Industry. *California Management Review, 29*(4), 51–76. doi: 10.2307/41162131

Rossignoli, M. (2011). *The complete pinball book* (3rd ed.). Atglen: Schiffer.

Ruben, A. (2018). *Pinball wizards, jackpots, drains and the cult of the Silber ball*. Chicago, IL: Chicago Review Press.

Sanou, F. H., Le Roy, F. & Gnyawali, D. R. (2016). How does centrality in coopetition networks matter? An empirical investigation in the mobile telephone industry. *British Journal of Management, 27*(1), 143–160. doi: 10.1111/1467-8551.12132

Santamaria, L. & Surroca, J. (2011). Matching the goals and impacts of R&D collaboration. *European Management Review, 8*(2), 95–109. doi: 10.1111/j.1740-4762.2011.01012.x

Schubert, C., Sydow, J. & Windeler, A. (2013). The means of managing momentum: Bridging technological paths and organisational fields. *Research Policy, 42*(8), 1389–1405. doi: 10.1016/j.respol.2013.04.004

Shalhoub, M. (2002). *The pinball compendium, 1, 1930–1960s*. Atglen: Schiffer.

Shalhoub, M. (2004). *The pinball compendium, 2, 1970–1981*. Atglen: Schiffer.

Shalhoub, M. (2005). *The pinball compendium, 3, 1982 to present*. Atglen: Schiffer.

Shapiro, C. & Varian, H. R. (1998). *Information rules: A strategic guide to the network economy*. Cambridge, MA: Harvard Business Review Press.

Shibata, T. (1993). Sony's successful strategy for compact discs. *Long Range Planning, 26*(4), 16–21. doi: 10.1016/0024-6301(93)90053-i

Silverman, D. (2000). *Doing qualitative research: A practical handbook*. London: Sage.

Simon, H. A. (1962). The architecture of complexity: Hierarchic systems. *Proceedings of the American Philosophical Society, 106*, 467–482.

Smith, W. K. & Tushman, M. L. (2005). Managing strategic contradictions. *Organization Science, 16*(5), 522–536. doi: 10.1287/orsc.1050.0134

Soh, P. H. (2010). Network patterns and competitive advantage before the emergence of a dominant design. *Strategic Management Journal, 31*(4), 438–461. doi: 10.1002/smj.819

Srinivasan, R., Lilien, G. L. & Rangaswamt, A. (2006). The emergence of dominant designs. *Journal of Marketing, 70*(2), 1–17. doi: 10.1509/jmkg.70.2.1

Stake, R. E. (1994). Case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 236–247). Thousand Oaks, CA: Sage Publications.

Stewart, D. (1984). *Secondary research: Information sources and methods*. Newbury Park, CA: Sage.

Suárez, F. F. & Utterback, J. M. (1995). Dominant designs and the survival of firms. *Strategic Management Journal, 16*(6), 415–430. doi: 10.1002/smj.4250160602

Sullivan, B., Jacobsen, C. & Rickard, E. (2010). *Special when lit*. Steam.

Sydow, J., Windeler, A., Schubert, C. & Möllering, G. (2012). Organizing R&D consortia for path creation and extension: The case of semiconductor manufacturing technologies. *Organization Studies, 33*(7), 907–936. doi: 10.1177/0170840612448029

Teece, D. J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research Policy, 15*(6), 285–305. doi: 10.1016/0048-7333(86)90027-2

Tellier, A. (2015). Le déclin des écosystèmes d'affaires: quelles leçons tirer de la chute des «trois géants de Chicago»? *Revue Française de Gestion, 41*(248), 23–39. doi: 10.3166/rfg.248.23-39

Tellier, A. (2017). Whatever happened to the 'great escape'? Lessons from the rise and decline of the pinball ecosystem. *International Journal of Technology Management, 75*(1–4), 121–141. doi: 10.1504/ijtm.2017.10006143

Tushman, M. L. & Rosenkopf, L. (1992). On the organizational determinants of technological change. In B. Staw & L. Cummings (Eds.), *Research in Organizational Behavior,* Greenwhich, CT: JAI Press.

Tomlinson, P. R. (2010). Co-operative ties and innovation: Some new evidence for UK manufacturing. *Research Policy, 39*(6), 762–775. doi: 10.1016/j.respol.2010.02.010

Tushman, M. L. & Anderson, P. (1986). Technological discontinuities and organizational environments. *Administrative Science Quarterly, 31*(3), 439–465. doi: 10.2307/2392832

Tushman, M. L. & Murmann, P. (1998). Dominant designs, technology cycles and organizational outcomes. *Research in Organizational Behavior, 20*, 231–266. doi: 10.5465/apbpp.1998.27643428

Utterback, J. M. (1994). *Mastering the dynamics of innovation*. Cambridge, MA: Harvard Business School Press.

Von Burg, U. & Kenney, M. (2003). Sponsors, communities, and standards: Ethernet vs. token ring in the local area networking business. *Industry and Innovation, 10*(4), 351–375. doi: 10.1080/1366271032000163621

Weber, R. P. (1990). *Basic content analysis*. Newbury Park, CA: Sage. doi: 10.4135/9781412983488

Yami, S., Chappert, H. & Mione, A. (2015). Séquences stratégiques relationnelles: le jeu coopetitif de Microsoft dans le processus de normalisation OOXML. *M@n@gement, 18*(5), 330–356. doi: 10.3917/mana.185.0330

Yami, S. & Nemeh, A. (2014). Organizing coopetition for innovation: The case of wireless telecommunication sector in Europe. *Industrial Marketing Management, 43*(2), 250–260. doi: 10.1016/j.indmarman.2013.11.006

Yin, R. K. (2009). *Case study research. Design and methods* (4th ed.). Applied Social Research Methods Series, Vol. 5. Thousand Oaks, CA: Sage.

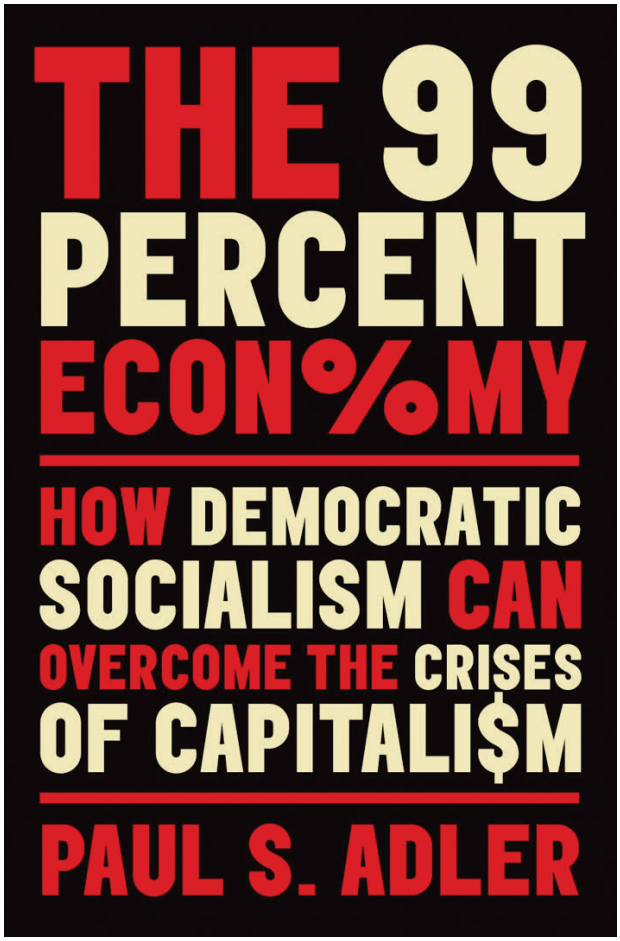
M@n@gement

UNPLUGGED: THE CRITICAL CORNER

Management, Socialism, and Democracy: A Dialog with Paul S. Adler on His Recent Book, *The 99% Economy: How Democratic Socialism Can Overcome the Crises of Capitalism*, Oxford University Press, 2019

Régis Martineau[1] and Paul S. Adler[2*]

[1]ICN Business School, CEREFIGE, Nancy, France; [2]University of Southern California, Marshall School of Business, Los Angeles, USA 90089



Paul, you teach in a business school, and yes, you are a socialist. As any critical scholar in management knows, that necessitates a strong ability to manage ambivalence. In your book, you need a lot of this skill to navigate both apparent and real contradictions, and you marshal this skill to propose an unusually radical way out of the dramatic crises we are facing. Looking back over your book, I made a list of some of the contradictions you had to resolve in the process of presenting your book's main argument.

A first contradiction: how can we call for replacing capitalism with socialism, and at the same time study and teach management? Business schools and management generally promote capitalism, and yet it is capitalism itself, you argue, that is responsible for the growing irrationality of our economic system and blocks us from overcoming the biggest challenges we face in society today. Are critical scholars in management dishonest and disloyal passengers of a boat they want to sink?

Fortunately, you dispel this contradiction and the associated distasteful vision of our jobs: yes, we can be critical of business without denying that there is some knowledge - in what we teach and what businesses do – that would be precious for a future democratic and socialist society. We should not throw the baby (managerial knowledge) out with the bath water (capitalism). To put it in another way, you argue that it is not because our economic system has reached its limits that we should throw away all we know about the management of organizations. On the contrary, we could use our managerial knowledge to help us decide democratically on how to manage strategically the use of our economic resources. By doing so, you reconnect with a classical Marxist idea: compared to previous economic systems, capitalism indeed represented progress in many regards – including managerial knowhow – but it is time now to replace capitalism with socialism in order to move on to a new phase of human progress.

A second ambivalence immediately appears. In an early part of your book, you convincingly demonstrate that our

***Corresponding author:** P. S. Adler, Email: padler@usc.edu

current economic system cannot overcome the crises that it has played such a big part in creating. Capitalism, like alcohol, cannot be at the same time the cause and the solution of the problem. But, on the other hand, we all know that prior efforts to create socialism have created despotic and anti-democratic nightmares, as in the Union of Soviet Socialist Republics and eastern Europe during much of the 20th century. The second contradiction risks leading your argument into a dead end.

You overcome this by mobilizing your 30-odd years of research in organization studies. Indeed, in your academic research, you have demonstrated that in several 'high road,' capitalist firms we can find traces of what you called 'enabling bureaucracy' and of other organizational means for sustaining employees' commitment to a shared organizational purpose (Adler & Borys, 1996; Adler & Heckscher, 2018). You have argued that it is a mistake to assume that big capitalist organizations, with their highly formalized hierarchies and systems and procedures, can be reduced to exemplars of 'despotic capitalist exploitation,' of the 'iron cage,' or of the 'iron law of oligarchy.' You have promoted a more 'optimistic' view of bureaucracy, echoing Gouldner, du Gay and others. You don't deny the reality of bureaucracy's role in exploitation and domination, but you argue that in capitalist businesses, that aspect coexists with bureaucracy's more productive aspects, as an effective tool for coordinating the efforts of the 'collective worker.'

And now, in this book, you take this idea and transpose it to the level of society. If some huge businesses have succeeded in organizing internally the coordination and collaboration of so many thousands of people and business units, why couldn't we do the same at an even wider scale – on the scale of the entire economy – in a democratic socialist context?

A third ambivalence: your book is at the same time reformist and radical. It is reformist, insofar as you do not reject management, and you see real continuity between capitalism and socialism, in particular in how socialism could build on these big-company management practices. But it would be a mistake to conclude that your book is another proposal for a reformed, kinder, and gentler capitalism. You are quite adamant – and offer a range of arguments for your view – that capitalism is unable to overcome the six crises you identify: economic irrationality, workplace disempowerment, unresponsive government, environmental unsustainability, social disintegration, and international conflict. You discuss rather sympathetically the various reform models that are currently promoted (ethical capitalism, regulated capitalism, social democracy, and digital revolution) but argue that we have a very good reason to believe that such reforms – while they might somewhat mitigate those crises – cannot overcome them, because they do not attack their root cause, namely, the private-enterprise capitalist system. Walking readers patiently from a description of these crises, to a diagnosis of their root causes, and to a critique of the limits of reformist solutions, you try to bring readers to see that we have little choice but to socialize the ownership of, and democratize the control over, society's productive resources. You offer a radical vision, far beyond social democracy or a mixed economy.

In doing so, you open up a surprising new arena for dialogue – between progressive managers who seek to build 'better organizations' and activists in labor and on the left who seek a socialist transformation. You also create a bridge between management and organization studies and the political science field: what can current management practice teach us about how could we organize, concretely, a democratic socialist society?

I encourage readers to judge for themselves the robustness of your arguments. Your book describes several examples of companies that have pushed in a progressive direction and whose strategic management practices might form a template for socialist planning practice. You highlight in particular innovative management practices that promise to make centralized decision-making more participative, standardize practices without stifling innovation, support collaboration and at the same time encourage productive competition, and synthesize collectivism and individualism. And toward the end of the book, you offer a provocative description of how a democratic socialist society could use these principles to ensure that socialist central planning is both effective and democratic.

Although your argument opens a dialogue between managers and other spheres of civil society, it is also an uncomfortable one – both for left radicals and reformist progressives. Let us first consider your challenge to the left radicals. In France and the United Kingdom, for example, militants on the left are very suspicious of managers, private-sector companies, multinationals, and business schools. They are unlikely to be receptive to the idea that they should take lessons from big American firms or business school professors. As critical management scholars, how could we overcome this skepticism? Did you try? Do you think that there are, somewhere in the United States (US) or elsewhere, some movements ready to listen to your argument?

> Thank you, Regis, for such a generous overview of my book. Your question is a fair one. I had a very specific audience in mind in writing this book: the young people who were excited by Bernie Sanders campaign in 2016. Many of them had little idea what the word socialism meant, but embraced the label as a way of expressing their feeling that some very radical change was urgent. This was my main audience.
>
> Public opinion polls in the US show that most people under 40 do not associate the term socialism with the 'bad old USSR,' but with the idea for a more egalitarian society. Their enthusiasm

for this idea, however, will not sustain for long a real movement towards socialism unless we can explain how socialism can avoid the problems encountered by 20th century socialism. That was the challenge I tried to address.

One way to do that could be to review the history of last century's efforts to build socialism, identify their successes and failures, and use this forensic approach to offer some recommendations. There are quite a few terrific books that do that.

I took the other path: I attempted to find in the world around us now some exemplars that would inspire confidence that socialist economic planning at a national scale could indeed operate democratically and effectively.

So where do we find such exemplars? Many on the US left refer with enthusiasm to the New Deal. That is a great reference point – every high-school student has learned about it, and political figures on the left often celebrate its accomplishments. But this is only a good reference point if you want to argue for social-democracy – for a society where the economy is composed of firms competing for profits but where government imposes serious regulations and sustains a robust welfare system, and where the 'social partners' work to find compromises. There is no doubt that such a form of society would represent great progress in the US. But I don't see how this form of society can overcome the six big crises that I focus on and that you just listed: social democracy could mitigate these crises, but has not and cannot overcome them. And overcoming them is getting urgent, especially on the environmental front.

Where else to find exemplars? In European countries like France, with some legacy of social-democracy's brighter years, you might focus on some big public-sector agencies that work well and draw lessons from them. Here in the US, however, such agencies are much harder to find. Conservatives in the US have done an effective job undercutting the effectiveness of our public services, so few people find much inspiration there.

Some socialists refer to worker cooperatives. That's a great reference point if you want to talk primarily about one of the six crises – workplace disempowerment. But it does not help us much in thinking about the other five crises, because these are all wider and more systemic in nature. To solve these systemic crises, we have to find our way to democratic decision-making at the national, indeed international level, not just at the enterprise level. We need a sharper image of a society with a comprehensively planned economy.

My response to this challenge was based on this simple idea: the big capitalist firm is an island of planning (albeit in a sea of market competition). In their internal strategic planning, firms encounter, in miniature, the same basic challenges as a socialist society will face in its planning efforts at the national level, namely, how to ensure that planning is both democratic and effective. By effective, I mean that it yields sufficient levels of innovation, efficiency, and motivation. Some of these firms have been pretty innovative in finding ways to overcome those challenges. If we squint hard enough to abstract from the capitalist character of these firms, we can form a pretty good idea of how socialist planning could be both democratic and effective.

Most young people – including most of those who supported Sanders – work in mid-sized or larger business organizations. While there's plenty to hate about the way most of these organizations function, and while those on militant left make it a point of pride to denounce those despotic features at every opportunity, my bet is that most people feel much more ambivalent (to use the term you introduced) about their work experience. In many organizations, strategic planning works pretty well to get people and units to work together (even if it's ultimately only for profits) (see Adler, 2012). So I figured I could make a case for socialism by getting readers to imagine that we used the best of these corporate planning techniques to make decisions about our whole economy.

For already-committed, already-sophisticated, left militants, my book offers mainly some new ways we can defend socialist planning ideas against the counter-arguments coming not only from the right but also from the reformist left.

Interesting approach! But now let's consider the other side – progressives and democrats who fear such a 'strong' version of socialism, one based on wide-ranging nationalizations and comprehensive (rather than merely 'indicative') planning. Indeed, as we said, you identify private property as the cause of our problems, and you want to socialize ownership of the bulk of society's productive resources (including land and housing). How do you bring readers around to even considering such a radical vision?

I try to show why such a radical change is needed to overcome each of the six big crises. The clearest case is surely the climate emergency (see Adler, 2015). According to the 2018 National Climate Assessment, if we stay on our current course, the world will see increasingly frequent and destructive wildfires, hurricanes, ice-storms and heat waves over the coming decades. Lower water tables and rainfall levels will cause massive crop failures. Rising sea levels will force millions to flee coastal areas.

Climate scientists tell us that the world must get to net-zero carbon emissions by 2050 to have a reasonable chance of avoiding chaotic breakdown. Moreover, wealthier countries such as the US will need to fully decarbonize much faster than that – by 2030 at the latest – to accommodate the poorer countries' slower decarbonization trajectory.

And in order for us to meet this 2030 goal, industry will be forced to abandon or rebuild trillions of dollars in assets. In the US that means not only rapidly shutting down the fossil-fuel companies such as Chevron and ExxonMobil and Peabody Coal, but also radically transforming the working assets of companies whose products run on oil – companies such as General Motors, Boeing, United Airlines, and FedEx. And further afield, there are vast swaths of our economy whose products and processes contribute to climate change, and which therefore must be radically and rapidly transformed – agriculture, cement, mining, forest products, water systems, chemicals, plastics, and many consumer products. And further afield again, climate change means we need massive

investments in infrastructure – sea walls, a new electric grid, new water supply systems, strengthened bridges, etc.

While there are a few industries that might see in all this a wonderful business opportunity (solar energy, green consulting, civil engineering), for most businesses, the extent of retooling required would saddle their shareholders with huge losses. Moreover, even if we elect a government determined to drive this transition, we cannot meet this goal without bankrupting a huge number of firms. Had we started this transition 40 years ago, when the science was already clear, perhaps we could have avoided this situation, but now it is probably too late. Given the massive strain on the solvency of so many businesses that this rapid transition would entail, it is simply impossible to see how it can happen without socializing the ownership of most of our industry and using that control to plan a comprehensive overhaul of our systems of production.

Your argument is also unusual for a critical scholar in management. Traditionally, Critical Management Studies (CMS) does not celebrate but rather denounces managerial discourses and practices. CMS focuses on the negative side of management – indeed, CMS scholars often denounce the very idea of management. Do you think that CMS, to be more impactful, should evolve to a more optimistic or positive attitude?

Your premise is quite right: many of the left and in CMS in particular seem to feel that to acknowledge any positive value for capitalism or management would be to undercut their critique. I think the opposite is true. Most people see capitalism as having brought real improvements in working people's lives over the longer term and on average. Few people deny that this has come with terrible costs. But our critique of capitalism degenerates into polemic if we can't find a way to acknowledge those benefits (see Adler, 2002).

More: when you consider the framing of our rhetoric, surely the very strongest position for us is to account for those benefits in a way that not only doesn't weaken our critique but is part of our critique. And that's what I find most appealing about Marx's way of conceptualizing the 'dialectical contradiction' between the socialization of the productive forces and the persistence of private property. Capitalist competition stimulates the progressive socialization of production, yielding productivity and affluence, but this very process simultaneously renders increasingly obsolete the capitalist private-enterprise property system – manifested in ever-wider and -deeper crises – and builds the material foundations for a post-capitalist world (see Adler, 2007).

In our management journals, we are seeing growing enthusiasm for ethnographic studies on alternative and activist movements, alternative forms of organizations (e.g., cooperatives, nongovernmental organizations, associations, nonprofit organizations, spontaneous occupations, and recently in France we see the development of 'Zones à Défendre' known as 'ZADs'). There is also a craze for 'holacracies' or 'liberated companies.' Yet, in your book, you rely mainly on examples from more traditional companies. Why not exploit what's exciting and new about these new forms?

I don't see how we address the wider and deeper problems the world faces today absent a massive shift at the national economy level away from private enterprise and competitive markets to socialized ownership and cooperative planning. So long as enterprises have to compete for investment funds from profit-driven investors, it makes little difference to our capacity to solve these bigger problems whether these enterprises are traditional businesses, workers coops, or holacracies. So the big question is then: how can we ensure that such national economic planning functions the way we want it to? These traditional enterprises have something to teach us about that, due to their massive scale and complexity and the performance pressures they are under. So their managerial innovations hold some unusually useful lessons for us.

In this book, you defend a 'positive' attitude, without denying the dark times that the crises of capitalism are preparing for all of us. This is an intermediary position between the very pessimistic 'catastrophists' or 'survivalists' on one side; and the (over) confident market or technology enthusiasts on the other. It makes me think of the recent 'post-growth' proponents, or eco-socialists, or radicals who try to establish local 'oases.' Do you think that with this book you contribute to this type of emerging mood (if it does exist)?

I return to Rosa Luxemburg's 'socialism or barbarism' dictum: on the hand, we have reason to hope – a better world is surely possible, and local experiments and oases remind us of that – and on the other, we have reason to fear – the consequences of not making this leap to socialism are increasingly dire. Can we live with that ambivalence? Surely.

Your emphasis on the climate crisis makes me wonder if you think that 'red is the new green': that a real ecologist project must be joined with a Marxist reading.

Yes, I am inspired by the growth of eco-socialist thought. This project still encounters some resistance on the left because people worry that we are putting the defense of animals and ecosystems ahead of the defense of people. That resistance is fading fast as the environmental crisis accelerates, and as the necessity of a socialist response to this crisis becomes more obvious. I love the French slogan that has emerged recently: 'end of the world, end of the month – same struggle'.

You have not quoted Marx in your book. Given the fact that for over 20 years you have been persistent in your efforts to legitimate Marxism in management studies, that's quite surprising. Why? To put it in another way, who is this reader you imagine, one who seems to be rather reluctant to read Marx?

Yes, this is an interesting feature of my book. Readers with a background in Marxist thought should find much that is familiar here, even if I don't explicitly call out those ties. But I was writing

primarily for people who have had zero exposure to Marxist ideas. We do not have the legacy you have in France of Marxist inspired parties and discourse. And without that background, I think it's unrealistic to expect my audience to dive into Marx. So I had a choice to make: either introduce readers to those ideas or try to make the argument in my own common-sense terms. I took the latter route … and then hedged my bet: my book, with 150 pages of text, has another 40 pages of endnotes for readers who want to go further, and in those endnotes, readers will find a whole library of Marxist thought. Even there, however, I don't discuss Marx's work, but try to provide a bridge to it via other people who have used his ideas and brought them to life.

But further on Marx and Marxism: the only direct reference to Marx in the entire book – buried in a tiny note – is in the third chapter of your book, where you build a very interesting argument based on Marx's notion of 'socialization.' Do you think that the Marxist community will be critical of how you use this concept?

I hope not! I use the term socialization to refer to the growing interdependence of productive activity. I think that corresponds pretty precisely to Marx's usage. The thesis is simple: the progressive socialization of productive activity both facilitates and renders increasingly imperative the corresponding socialization of property. I think that's a classic Marxist thesis. To return to the earlier point: I think Marxists have lost track of this idea because they have become so wary of acknowledging anything progressive about capitalism.

It is very hard for a scholar to present normative propositions. Yet, very frequently in the second part of the book, you adopt a strongly normative position. How do you justify that?

I describe this book as 'research based, and public facing': it is published by Oxford University Press, but it is not addressed primarily to a scholarly audience, nor is it popularizing scholarly work. It is an argument for socialism – but an argument, not just a polemic. I did my best to identify counter-arguments at every step, and offer reasoned defenses. But of course, in the end, it is indeed a normative work.

We all know the traps of the words we choose in this type of political proposition. Why and how did you choose the expression 'democratic socialism'? Is this a way of taking distance from ideas of communism, anarchism, communalism, and the other strands of utopian thought?

Indeed, a complicated issue! In the US today, socialism has come – thanks to the extremist positions of the Republican party – to refer to any system where government plays more than the minimal role allowed by ideologues like Milton Friedman. I take that as my starting point. There's nothing gained by saying it's stupid: words mean what people use them to mean. So then I ask what kind of socialism we should be aiming for if we want to overcome the big crises and challenges we face. I argue that the 'moderate' forms (regulated capitalism or social democracy) won't suffice, and that we need a pretty radical form – one that involves a big dose of centralized planning. And if that's the goal, the biggest concerns – widely acknowledged – are whether such system can operate democratically and effectively. Democratic socialism seems like as a good a label as any for that.

It's true that Sanders has said that he aims for policies like those in Scandinavian social democracy, but he is a smart guy who knows the difference. I take him to be saying that his campaign will aim at social democracy, knowing full well that the resistance of the capitalist class will force us to go further if we don't want to retreat. So my book aims to prepare Sanders' supporters for that bigger struggle ahead,

I realize that other people have used the term democratic socialism to mean a model in which market competition rather than planning will still guide enterprises' decisions, but where government regulations and the cooperative constitution of those enterprises will yield a better world. This is a model that attracts a lot of interest in the United States, because we have such a long tradition of seeing the main enemy as big business and centralized government – a tradition that advocates decentralization and 'small is beautiful.' But I am yet to see an account of such a system that shows how we overcome the big challenges we face without a hefty dose of central planning. So I call my model democratic socialism and use the opportunity to argue that democracy is not reducible to local independence – it's a principle for governing our interdependence. Democratic socialism, as I see it, is the extension of democratic decision-making to the governance our country's entire economy.

References

Adler, P. S. (2002). Critical in the name of whom and what? *Organization, 9*(3), 387–395. doi: 10.1177/135050840293003

Adler, P. S. (2007). The future of critical management studies: A paleo-Marxist critique of labour process theory. *Organization Studies, 28*(9), 1313–1345. doi: 10.1177/0170840607080743

Adler, P. S. (2012). The sociological ambivalence of bureaucracy: From Weber via Gouldner to Marx. *Organization Science, 23*(1), 244–266. doi: 10.1287/orsc.1100.0615

Adler, P. S. (2015). Book review essay: The environmental crisis and its capitalist roots: Reading Naomi Klein with Karl Polanyi. *Administrative Science Quarterly*, 60(2), 13–25. doi: 10.1177/0001839215579183

Adler, P. S. & Borys, B. (1996). Two types of bureaucracy: Enabling and coercive. *Administrative Science Quarterly, 41*(1), 61–89. doi: 10.2307/2393986

Adler, P. S. & Heckscher, C. (2018). Collaboration as an organization design for shared purpose. In P. Hiller, L. Ringel, & C. Zietsma, (Eds.), *Research in the Sociology of Organizations* (pp. 81–111). Bingley: Emerald. doi: 10.1108/S0733-558X20180000057004

M@n@gement

UNPLUGGED

We All Became Wambats! From Pillar to Post with the Analogy between Publishing Scientific Prose and Producing Cubic-Shaped Poop[1]

Sébastien Liarte[1,2,3,4]

[1]Université de Lorraine, Nancy, France; [2]Université de Strasbourg, Strasbourg, France; [3]CNRS, France; [4]BETA, Nancy, France

Researchers are well aware that university breaks are often the most inspiring periods for writing, in particular academic articles. Still, one cannot prevent our relatives from questioning why we are not more available for them. This is what happened when my daughter came to me with her bag full of tricky questions.

- Daddy, come play with me!
- (*grumbling as I come out of my mental focus*). Not right now, honey, I'm working.
- (*the little angel was getting slightly pissy*) But … it's Christmas break! You're supposed to be on holidays! Just like your students! Just like us!
- (*feeling like I had to* justify myself) Yes … alright … I know sweetheart … but I have to finish this paper.
- But you always have a paper to finish … or to start … I can't believe it! Why do you always keep working on your articles … Are you less gifted than the others? Do you have to work harder than the others?
- (*damnit, sneaky little girl! This was not even a silly question*) Mhmmm … You're probably right … But you know, publishing in an academy journal is not that easy. It is really hard work!
- But why? What is an article actually made of?
- (*alright, let's try to keep her mind off of trickier questions by talking about my job*) Well … an article, you know, is quite a simple thing: you report your research to a broader audience. Just picture your presentations during your science classes, you see?
- (*obviously rejoiced, as she seemed to have understood it all in a flash*) Alright, so it's very easy, you just write down your thoughts, describe the experience, share the results and … *tadam* ! -
- (*getting into details*) Yes, you're spot on … well, not fully but that is how it roughly goes. And there are a few implied rules to follow on top of that.
- Implied … rules? What are you talking about?
- (*Alright, calm down Professor Snape, you are not talking to your students. Well, anyway even they are usually clueless about what I mean.*) There are rules that have to be followed but are not written anywhere.
- (*Clearly not happy with my answer*) How do we get to know them then?
- You learn them from experience, or from being taught by someone who knows them.
- Oh, that's right! Just the way the teacher does with us.
- Yes, you are lucky to have a teacher who shows you the way things work. And just like your teacher, there are people over here, who assess our work, give us a grade, and tell us how we can improve it. Even though most of the time, they just tell us that our subject is not that interesting and that we should not waste our breadth over it.
- (*she is not one to give up that easily*) Most of the time? Everyone says that? So everyone sucks?
- Some people more than others … well, some have to spend more energy than others at work … and it depends on the journal you are targeting … But yes, that is how it goes.
- (*Now she seemed really surprised*) Alright, so publishing is somehow exceptional, like an accomplishment … Shouldn't it be the other way around, if publishing is the purpose of your job?
- You are right … But there are several reasons why it is not that straightforward.

***Corresponding author:** Sébastien Liarte, Email: sebastien.liarte@univ-lorraine.fr

[1.] My acknowledgement goes to Maxime Duda for his conversational English language skills.

- Ah … I see. In fact, you guys, the researchers in management… you are wambats!
- (*first time I hear that word*) Pardon me young lady?
- Wambats! Dad, do you even know about wambats? The wambat is such a great animal! It is the only living creature who produces cubic shaped doo-doos.
- Great… I'm trying to tell you things about my daily work in an adult way and you bring it down to bathroom jokes.
- No way, Dad, it's exactly the same thing! Making a cubic poop is just like publishing an article: it is really, really difficult. No colon is ever naturally made for that, no one shows you how to do it and that is what makes wambats so unique. They pile up their most beautiful cubic shaped dumps, and at the end, the one with the highest pile of cubic dejections becomes the leader!
- Your comparison is funny … because in our work community, the one who manages to release the most impressive articles in the best journals, the one who stacks the most written production, turns out to become the boss! Our top researcher!
- That is exactly what I'm telling you, you guys are wambats! And of course, these animals get stronger over and over because those who manage to make the most cubic-shaped poops are those who survive the longest … And as a result, they mate among themselves!
- That's right! This is how Evolutionary mechanisms go: some of us adapt to our environment and get stronger, we become experts in cubic poops…gahhh… I mean experts in writing more accurate articles. We emulate each other as we are living among our wombat counterparts.
- Alrighty, I think I have seen that on YouTube … First of all, their diet is important. Apparently, they eat very dry things to produce the perfectly shaped dejection. On top of that, it seems like some parts of their colon have a different springiness. That is how you get the best cubic-shaped poop.
- Same goes for our shi … sorry, I mean our sheets … of paper, the best newspapers and journals: an environment that offers the best resources (dry food for wambats, advice from close colleagues for researchers), a 'special personal talent' (a more flexible intestine or writing skills) and a lot of work to achieve greatness.
- See, I was right, Daddy, you're all wombats!
- You could see it this way …
- But… why are you doing this? The wambat has its own reasons … For example, it is an animal with poor eyesight. And everyone knows that a stack of poop is more visible from afar and smells stronger.
- Well, you could say the same about us! Sometimes finding out who works harder, or better, is useful. It is not an easy thing to sort out as our works are difficult to evaluate and compare. In a perfect world, you would have to read them all, this is a hell of a hard work … So, stacks of pretty cubes are handy! Evaluation boards are sometimes just a group of shortsighted wambats who feel lost in the middle of stacks of cubic-shaped poop.
- (*Stubborn little thing, she would not give up*) But who decides if your poop is truly cubic? How do they assess it?
- Well, there's a whole system of evaluation behind it. There are heads of academic journals and chief editors, who ultimately decide whether the poop is cubic enough to be part of the stack. Specialists and evaluators assess the cubic-ness, and even sometimes advise us on shaping them best. Then, on a collective level, there are filters that grade the quality of the poop, those are the academic journal's rankings.
- But everyone plays that game? Isn't there anyone who is trying to do something else? Like a triangular poop?
- Well, some people do not get in line, indeed! If for some reason, we don't want to make cubic-shaped poop, we can try triangles, balls, etc., like books, press articles, videos. But the problem remains: it is like squaring the circle …and even worse, the stacks might smell less. Other people try to change the filter, the evaluation rules to determine the very definition of what is cubic or not. Tools can be changed to prove that triangles are in fact cubes. But at the end of the day, stacking remains difficult …
- (*with a little bit of mischief*) Oh yes, your rankings are like thermometers. If you want to live in a country with 20° all year round, you can move to Marrakech, or you can build a thermometer that always points to 20°C … But if you go for the second option, it will not prevent you from feeling cold anyway.

She eventually stared at me with a stern look, and raised one last meaningful question.

- But don't you feel sad sometimes? A wambat is a cute animal, but… you, you keep striving to get better results, better-shaped poop, working always harder … doesn't it ever feel absurd and sad?
- Ah well … my sweet darling … I leave that opinion to you. On my end, I have to go back to my shapeless piece of poop … and stack my pile until it is high and smelly enough.