

Toward a dynamic capabilities' diffusion model for international business headway of SMEs: evidence from the metallurgic and metal-mechanic (MMI) sectors

Diffusion
model for
international
business

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Abstract

Purpose – This paper aims to explore the characteristics of capability exchange within internationalizing small and medium enterprises (SMEs) of the Portuguese metallurgic and metal-mechanic sectors.

Design/methodology/approach – Multiple case research instrumentalizes a (manifest) content analysis based upon qualitative data gathered from the interviewing of the strategic apex of four multinational enterprises, codified in the light of the well-known Weber protocol.

Findings – The results uncover the existence of a multi-diffusional approach with a bi-directional regime of transferability, where reciprocal transference is non-simultaneous. Operational rigidities are asserted to be stifling the diffusion of capabilities across subsidiaries and hindering higher economies of learning.

Research limitations/implications – The current paradigm of international capabilization of the sector requires substantial enhancements in its design for the benefit of the firm's international competitiveness, growth and wealth.

Originality/value – Organizational capabilities are a determinant of competitiveness. Hitherto, the phenomena of (capabilities) mobility and transferability are still acknowledged as a clear gap. This study opens, therefore, avenues on international capabilization in relation to the modeling and testing of global dynamic capabilities and its replicability across industries.

Keywords SMEs, Capability-diffusion, DC-mutability, DC-transferability, Global dynamic capabilities (GDCs), Internationalizing small and medium enterprises (ISMEs)

Paper type Case study



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Introduction

Background framework

Nowadays, business ecosystems encounter unparalleled challenges as to their ultra-dynamism, hypercompetition and hypervelocity, commonly perceived by the organizations as to a résumé of external environmental traits, namely, volatility, uncertainty, complexity and ambiguity (VUCA). Right from its inception, it has involved a combination of factors, such as the rise of the knowledge economy, the intense global competition or significant technological advancements (Peng and Lin, 2017). The prior elements has outlined immediately above seems to be steered by the policymakers' interference through regional development strategies currently taken to promote supportive environments for the fostering of innovative startups (aka, *entrepreneurial ecosystems*) focused mainly on high levels of human capital(ization) and upskilling of labor with implications for the competitiveness of both newcomers and incumbents and subsequently shaping the ecosystem's stakeholders spectrum or the market's organizational ecology (Spiegel and Harrison, 2018; Laamanen *et al.*, 2016; Spiegel, 2015). Moreover, innovation-driven contemporary international business ecosystems are additionally influenced by the openness of the two-sided market logic of the sharing economy and the appearance of *big bang disruptors* increasingly defying the positioning of both dominant and matured established enterprises (Abrantes, 2020a; Rong *et al.*, 2018; Laamanen *et al.*, 2016; Downes and Nunes, 2013).

On the incumbents-side, such market hindrances are unavoidable circumstances to be dealt with (Arora *et al.*, 2020; Teece *et al.*, 2016; Held *et al.*, 2000). Yet, firms possess the ability of strategic (re)fitting, since as claimed in earlier literature, their bundle of *technological and social capabilities and their distribution in space, are not carved in stone but evolve, and this presents countries with new challenges and opportunities* (Fagerberg and Shrolec, 2016, p. 777). Hence, some scholars argue that capabilization of the firm as being of paramount importance for their strategic agilization, and herein, posit *dynamic capabilities (DCs)* as *the* most suitable recipe to high-changing, hypercompetitive environments and to the establishment of long-lasting advantages (Teece *et al.*, 2016; Cepeda and Vera, 2007; Lawson and Samson, 2001; Amit and Schoemaker, 1993).

For instance, the capabilities of the firm, especially the subset of founders and managers-owned ones, both cognitive (e.g. foreign language skills or international education) and managerial capabilities (e.g. particular technical competencies or internal coordination experience) are perceived as determinant factors of accelerated international expansion (Gulanowski *et al.*, 2018). Yang and Lütge (2019) emphasize the hidden potential of mergers and acquisitions particularly from emergent multinational enterprises for the efficient acquisition of valuable resources and capabilities in developed economies. Likewise, Peng and Lin's (2017) research on the internationalizing of small and medium enterprises (ISMEs) reveal furthermore the particular importance of capability-building of two separate sets of DCs, namely, global marketing capabilities (GMCs) and global product-design-capabilities (GPDCs) because of their effects on two outputs of a firm's performance, i.e. growth and profitability. This is consistent with the results of Pinho and Prange (2016) advocating the influence of explorative capabilities – value-adding and disruption ones, in which GMCs and GPDCs fit in, as moderators for international performance.

Regardless of the espoused business-level strategies, a quasi-universal consensus as to the importance of international capabilization seems to exist across resource base-theorists within strategic management literature. Nonetheless, *capability dissemination* seems though a phenomenon underexplored and appealing for a significant contribution. In this context, this research focuses, therefore, on the scattering of organizational capabilities (OCs), tested

within the microsphere of ISMEs of the Portuguese metallurgy and metal-mechanic (MMI) sectors to understand the role played by them in shaping the strategic agilization of the firm to environmental hindrances. Herein, three OCs were purposively selected for an empirical test in this sector, namely, the *networking capability (NC)*; the *research and development capability (R&DC)*; and, the *product-level innovation capability (PdIC)*.

The selection of those OCs is further explored on the *theoretical framework* section. Nevertheless, these capabilities may be preliminarily introduced here, as a subset of the DCs, which have been asserted in earlier research as the most important ones in *strategic importance* and *relative strength*, conveying long-term or sustainable competitive advantages (SCA) in markets of moderate to high turbulence (Frasquet *et al.*, 2018; Teece, 2014; Ambrosini *et al.*, 2009; Rothaermel and Hess, 2007; Weerawardena *et al.*, 2007; Eisenhardt and Martin, 2000). Paradoxically, the theme of global dynamic capabilities' (GDCs) mobility and transferability observe a shortage of scholar's devotion, seemingly incongruent with the preponderant role of GDCs in the context of multinational enterprises (MNEs') (*societal, network and territorial*) *embeddedness* within international markets and firm's performance (Frasquet *et al.*, 2018).

A triad of GDCs are alleged to play a decisive mediating effect upon the pace and scope of future capability-building and dissemination of other DCs (and so, underpinning the future of MNEs): an *absorptive capacity (ACAP)*; a *networking* ability and an *innovation* potential (Rodríguez-Serrano and Martín-Armario, 2019; Engelman *et al.*, 2017; Teece, 2014; Weerawardena, *et al.*, 2007; Zahra and George, 2002). Inevitably, these GDCs are commended as a future research avenue as to their *foci* upon foreign embeddedness as further explored at the *gap-scoping and research aims* section (Wu and Vahlne, 2020; Khan *et al.*, 2020; Elsahn *et al.*, 2020; Ambulkar *et al.*, 2015; Schilke, 2014). In addition, most recent research underpins the relevance of capability's transferability (surrounding these targeted OCs), for the fulfillment of a lack of corporate talent management strategies across multinational company (MNCs), supported also on the ease-to-transfer across practitioners and policymakers of technology and innovation management scholarship (Elsahn *et al.*, 2020; Napathorn, 2020).

The targeting of the MMI sector for the empirical testing is because of their solid position in the national economy with a large exporting and outward investing track, which constitutes a favorable scenario of investigation. Furthermore, the MMI possesses a high potential for rising sophistication and differentiation to accommodate complex scenarios of environmental VUCA), i.e. a high potential for further capabilization (up/reskilling), as asserted by the *national model of competitiveness* (Bento, 2011).

A multiple case research covers two-thirds of the segments (S_n) of the MMI, *metallic and electrical products* and *transportation equipment* and excludes *basic metallurgies*. The two initial segments represent the vast majority of the organizational ecology in the sector (97% of the firms; 73.5% of revenue and 95.4% of employability) (Banco de Portugal, 2017). An open-end enquiry was conducted across pivotal informants of the strategic apex of each of the selected firms. Seven units of analysis (UAs) were observed, with the participants/UAs being purposively targeted because of their potential valuable insights allow for the building of a data set toward the saturation point of information.

Gap-scoping and research aims

Prior studies in dynamic capabilities theory (DCT) were dubbed as allegedly holistic approaches, criticized for their utility, meaning and teleological stance (Di Stefano *et al.*, 2010; Arend and Bromiley, 2009; Winter, 2003). Such critique appeals to sharper gap-targeting with wider contributions and opening of further research avenues.

Accordingly, the clear gap observed in the literature regarding the diffusion processes of GDCs is addressed here. The rationale for pursuing such a gap (diffusion processes) is the particular attention of DC theorists to the explanatory nature of the firm's competitiveness and performance, leaving open avenues for further significant contributions in this subfield (Akrofi, 2016). Arora *et al.* (2020) and Schilke (2014) suggest that apart from the research gap, the transferability is an issue from the incumbent's side, as firms reveal an ineptitude (apparent in relation to SMEs) or simply that the transference is too thin to enhance short-term returns. This is supported also by Pereira *et al.* (2019) findings over a decade of research upon the subset of emerging small and medium enterprises in three European markets (France, Germany and UK), which reveals that the higher the investments on DCs, the higher was their translation into firm's agility in relation to embeddedness and technological performance.

Previous endeavors to fulfill this gap are acknowledged, for instance, in the studies of Arora *et al.*'s. (2020) on the gauging of GDCs evolution or Ambulkar *et al.* (2015) and Schilke (2014) tracking the formation GDCs (as, alliance management; new product development (NDP) or resilience); however, not centered on the framework of GDCs' diffusion. Likewise, the two-year project (the *global capability framework for public relations and communications management*) highlighted by the University of Huddersfield (UK) represented a large contribution to the framework of GDCs, as a Delphi study on public relations and communication management capabilities, regrettably, which was solely concerned with the "identification" of GDCs, disregarding "mobility" and "transferability" as well (Thurlow *et al.*, 2018; Fawkes *et al.*, 2018). In addition, Jerez-Gomez *et al.* (2005) have developed a DC measurement framework with limited application to general capabilities or capability-bundles, yet with the virtue of broadening horizons for alternate research paths on the future modeling of scales and measurement units toward OCs.

Hence, this research requires that it will be open to a substantial contribution, which would address the major GDCs as suggested in the earlier literature and therein to draw concrete measures for a future framework of GDCs diffusion, as exhibited in section *Conclusions*. In this sense, a triad of capabilities are cumulatively tested: an *NC*; a *R&DC*; and, a *PaIC*. Thus, on the prior assertion of DCs being key-determinants of a firm's differentiation and wealth, it must, therefore be prescribed the successful dissemination of GDCs, essential for its achievement. Consequently, the significance of this research lies in the instrumentalization of the duality of *capability-requirements* (CR) on the transferee-side and the *capability-gaps* (i.e. transferor's intention versus CR) through a multiple-case study of a mature global industry (Abrantes, 2020b; Teece, 2019).

Here, the selected cases, chosen deliberately, over non-dominant incumbents within the target population of ISMEs, as these are the largest majority of the organizational ecology in this sector. In this context, the aims of this investigation are: to grasp the general capability-dissemination of the sector (Aim 1 or A1); and, to explore the capability mutations endured for adapting to market-specific challenges (Aim 2 or A2). Aim 1: it addresses the core topic under investigation while in Aim 2 the ability to streamline the capability's transference as a determinant factor of adaptation to country-specific VUCA business ecosystems. According to the descriptive-exploratory purpose of this research, which is inherent to the aims presented above, the article proceeds with a theoretical revision of the DC's literature, narrowed to a triad of critical aspects of, mobility, transferability and mutability. Hereafter, the methodology unveils the research design, a (multiple) case (four MNCs of the MMI sector), the sampling approach, the data collection and analytical procedures (*vis-à-vis* interviews and content analysis (CA)), followed by the discussion as to the findings and the respective extrapolation of its conclusions.

Theoretical framework

Micro-foundations, conceptualization and theoretical framework

Rooted in the resource-based view (RBV) of the firm, the DCs theory seem to extend and revitalize the OC's research, as DCs were considered the ultimate source of competitive advantage (Wang and Ahmed, 2007; Cepeda and Vera, 2007; Eisenhardt and Martin, 2000).

Early definitions of DC were then a remedy for the RBV theory competitiveness limitations in rapidly changing markets, hypercompetitive and high-velocity environments (Teecce and Pisano, 1994). Although the growing attention garnered by DCs led to the emergence of a plurality of definitions, deriving from a triad of motives, the nature; the complexity; and interdisciplinary of this concept (Helfat and Peteraf, 2009). Such heterogeneity, which populates the dynamic capabilities view (DCV), seemed however, to converge into a dual pathway of two separate streams of thought (the *Teecian* and *Eisenhardtian*) by their clear conceptions (Peteraf *et al.*, 2013):

The firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments (Teecce *et al.*, 1997, p. 516).

[...] organizational and strategic routines by which companies achieve new resource configuration, according to market dynamism as markets emerge, collide, split, evolve, and die (Eisenhardt and Martin, 2000, p. 1107).

The first, the *Teecian* (or also so-called *TPS* approach) it comprises an eclectic attribute-base, which was derived from the possessed competencies within a firm (Barreto, 2010). Henceforth, the original conceptualization incorporated auxiliary features of (timely and effective) sense and seizing of opportunities (Pitelis and Teece, 2010). The second (the *Eisenhardtian* or *EM* approach), a more parsimonious in nature while exploring the DC-deployment phenomenon, postulated that a DC is a firm-level matured specific ability reinforced by its continuous exercise and routinization. Yet, multiple other definitions incorporated similar characteristics (Lessard *et al.*, 2016; Al-Aali and Teece, 2014; Barreto, 2010; Helfat *et al.*, 2007).

Hence, it may be inferred that the epithet "dynamic," referring to an OC, entails an underlying ability to "influence" third capabilities (as a sum of *integration* + *reconfiguration capacities*) and/or to foresee environment challenges whether they are opportunities or threats. In this sense, the dynamism resides on two elementary morphological features of all DCs, i.e. *interaction* and *flexibility*. The interaction with other capabilities encompasses the enrichening of its resource-base through integration, while its flexibility encompasses the ex-ante ability to reconfigure itself, as to the predisposition to be modified and adapted to harsh environmental changes.

Hence, interaction is a key element to connect with and integrate components of other capabilities, which *per se* is dependent upon the complementarity of the multiple resources involved in the architecture of the capabilities. Thus, the DCs are formed by the underlying recombination of resources that hold their morphology and allow their applicability into and market utilization. The virtues of interaction are particularly noticed in its outputs, such as more sophisticated innovation-launching, deriving from the recombination of the resource-base and furthermore perceived by other incumbents competing in the same industry as a form of causal ambiguity, i.e. hard-to-be-understand; and subsequently, hard-to-imitate (Grant, 2016). Therefore, such interactionism is within the strategic management literature perceived as a mechanism of deterrence against imitators.

On the other hand, *flexibility*, is subsequent to higher-fluidity in resource's integration, as the ability to quickly rearrange the allocation of resources of the firm and reconfigure

organizational systems is essential to the reconfiguration (Doz and Kosonen, 2011). Unsurprisingly, it is the association of flexibility with resource-fluidity (Doz and Kosonen, 2011; Junni *et al.*, 2015); and furthermore, the assertion that *strategic agility* is a meta-capability against VUCA, involving *strategic sensitivity* (the awareness to comprehend the surrounding environment), *leadership unit* (fast and bold decision-making); and *resources fluidity*, formulated as follows (Doz and Kosonen, 2011).

On the contrary, the “non-dynamic” OCs are restrained in influence to its own boundaries, regardless of the extent of possession and level of utilization of a capability. In this sense, it appears to be consensual in the DCV the existence of a double-tier of capabilities, the first-order capabilities (DCs) and the zero-order capabilities (non-DCs). The latter are commonly termed as *operational capabilities* or *ordinary capabilities* (Zollo and Winter, 2002; Teece, 2014). Some scholars advocate though the existence of two additional tiers. One identifying capabilities with an inner potential of renewal or total reconfiguration (*second-order capabilities*) and another, referring to *meta-capabilities* or *third-order capabilities* (e.g. strategic agility or international ambidexterity) associated with the bundling into combinative capabilities (Abrantes *et al.*, 2020; Teece, 2016; Beer, 2013; Prange and Verdier, 2011; Danneels, 2008; Collis, 1994).

First-order capabilities have been typified within different parameters, as incremental and regenerative capabilities (as to the pace), individual or collective capabilities (as to the possession), cognitive, managerial and substantive (as to the utility), global or non (as to their geographical span) and threshold, consolidation, value-adding and disruption capabilities (as to the internationalization of the firm) (Eggers and Kaplan, 2013; Helfat and Peteraf, 2009; Zahra *et al.*, 2000; Prange and Verdier, 2011). The next section will focus in particular on the batch of GDC, assumed to hold wide functional and geographical mobility features and is, therefore, readily testable in the context of this research topic (i.e. *capability diffusion*).

Mobility and global dynamic capabilities

Despite the primary virtues of DCs yielding the formation of sustainable advantages to the firm, it is furthermore acknowledged as to their potential of duplication (Eisenhardt and Martin, 2000), mobilization and transferability (Abrantes, 2020b; Wang and Ahmed, 2007; Madhok and Osegowitsch, 2000; Luo, 2000) including on a global scale while adapting to environmental challenges (Weerawardena *et al.*, 2007; Griffith and Harvey, 2001). Moreover, some scholars recognize the phenomenon of *mutation* of attributes along the capability’s transference process, claimed to be associated with the purpose of adjusting to the destiny markets (Abrantes, 2018; Wang and Ahmed, 2007). The latter supports the reasoning of (capability) *mobility* across markets, here defined as an *inner trait of an OC, allowing its transferability, relocation and/or shared-utilization by third parties inside/outside the firm*. In this sense, the construct of mobility is key to grasp what a GDC is.

GDCs are ascribed as to their purpose:

[. . .] to create, deploy, and upgrade organizationally embedded and return-generating resources in pursuit of sustained competitive advantages in the global marketplace (Luo, 2000, p. 355).

Beyond the enhancing of firm-specific advantages (FSAs), GDCs are additionally foreseen as enterprise risk resilience dampers against internal organizational threats and bias regarding:

- Internal communication.
- Decision-making.
- Monitoring processes (Bogodistov and Wohlgemuth, 2017).

Thus, the effects of GDCs are noticed at the organizational capital tier (Engelman *et al.*, 2017). These scholars, on their research over 500 firms in South America confirmed these effects upon the structural capital of the firm, beyond intellectual or human capital gains (as the most visible and direct ones), being, therefore, assumed as a straightforward determinant of the ability in the present and future to further absorb, retain and use multiple capabilities, whether acquired or transferred ones.

Naturally, prior literature realized GDCs as a subset of first-order capabilities, in which, as to the *modus operandis* of their transferability, scholars emphasize a flexible transference for succeeding in achieving to SCAs (Griffith and Harvey, 2001). Such *flexibility* is argued to be obtained through the tailoring of their transference to each market, as a casuistic transference, here dubbed as an *idiosyncratic approach* toward transferability. Conversely, Lawson and Samson (2001) devalue *flexibility* and the morphological *adaptation* to local/foreign markets. These authors consider these “capabilities” (strategic flexibility and adaptation), as distinct attributes (instead of DCs), built-in on their seven components model of a GDC:

- (1) Vision and strategy.
- (2) Harnessing the competence base.
- (3) Organizational intelligence.
- (4) Creativity and ideas management.
- (5) Organizational structure and systems.
- (6) Culture and climate.
- (7) Technology management.

However, some of these “components” were, on the contrary, portrayed by other scholars as GDCs; for instance, referring to adaptation (Wang and Ahmed, 2007); creativity (Cepeda and Vera, 2007; Zahra *et al.*, 2000) or technology management (Helfat and Peteraf, 2009).

Although avoiding such philosophical discussion, GDCs are then classified as *managerial* and *cognitive*, here inventoried from a collection of articles for future memory in both categories: as *ACAP; adaptation; alliance management; change orientation; creativity; coordination; entrepreneurship; innovation; information technology processes; knowledge creation/usage/recombination; marketing; networking; organizational learning; power exercising/controlling; product development; strategic decision-making, patching; research and development; resilience or technology management* (Rodríguez-Serrano and Martín-Armario, 2019; Bogodistov and Wohlgemuth, 2017; Engelman *et al.*, 2017; Ambulkar *et al.*, 2015; Ambrosini *et al.*, 2009; Oliver and Holzinger, 2008; Weerawardena *et al.*, 2007; Wang and Ahmed, 2007; Cepeda and Vera, 2007; Rothaermel and Hess, 2007; Nielsen, 2006; Zahra *et al.*, 2000; Arthurs and Busenitz, 2006; Verona and Ravasi, 2003; Buckley and Carter, 2002; Zahra and George, 2002; Lawson and Samson, 2001; Griffith and Harvey, 2001; Eisenhardt and Martin, 2000; Teece *et al.*, 1997).

Whether GDC is a subset of a DC as defended by Luo (2000) or a meta-capability as advocated by Lawson and Samson (2001) the common denominator in prior scholar’s reasoning seems to be the geographical span (i.e. global marketplace), with the *locus* of attention placed on their *geographical mobility*. Here, we hinged it with the notion of *functional mobility*, as the strategic management field, supported on prior and current industry practices, observes MNCs cumulatively the transferring of capabilities to other functional areas of the organization. This pattern is consistent with existing theory on corporate diversification and organizational structure, as multidivisional form designs

are not obstructive of resources and capabilities transference across divisions whether through a “related-constrained” or “related-linked” model of transferability (Volberda *et al.*, 2011). This means that as GDCs incorporate both geo and functional mobility attributions and their ample sharing is feasible across strategic business units (SBUs), regardless of the location, activities, synergies and role in the corporation. Thus, a GDC is likely to incorporate both geo mobility and functional attributions despite the hindering forces counter-playing to the external environment as foreign entry or mobility barriers (Bain, 1956).

Nevertheless, Fernandez-Moya and Fernandez-Perez (2019) and Rodríguez-Serrano and Martín-Armario (2019) argue that firms are unwillingly “locked-in” into a path dependency phenomenon, in which, prior learning traits condition subsequent knowledge-gains, being, therefore, deterministic of a chain of learning, shaping both the ability of organizational-stakeholders to communicate, process-structure and target the needs of capabilities (as “capabilities’ dissemination capabilities”). On the other hand, this path dependency shapes the ability of what ought to be transferred, in terms of breadth, pace and relevance (as the effective capabilities diffusion). This refers to an ACAP argued to be a prominent status of preparedness of the firm, as to their openness and awareness to, for the further acquisition, utilization, development and opportunity-seeking, which is foundational for posterior learning and for the cross-integration of that learning. Thus, we may infer, an association between born-in or early-developed in, high knowledge bundles and enhanced capability. Teece (2019, p. 193) termed this *ex ante* preparedness status as the *sensing and sense-making apparatus*, which entails the reevaluation of scenarios within particular business ecosystems and the recalibration of opportunities and threats. This sensing and sense-making exercise allows the firm to determine their needs of critical capabilities and bottlenecking assets to be acquired or enhanced.

Hence, this *ex ante* ACAP refers to Zahra and George’s (2002) definition of *potential absorptive capacity (PACAP)* to further acquisition and assimilation, preceding the *realized absorptive capacity (RACAP)*, as its inherent processing and exploitation (or utilization). Thus, the PACAP is argued to be fulfilled by the Teeceian sensing and sense-making apparatus (of scenario evaluation and analysis of opportunities and threats) while the RACAP as an outcome of the prior, corresponds to the achievement of critical assess and capabilities (Teece, 2019). Noticeably, the ACAP is a decisive preliminary skill for the adoption of a DC on the transferee’s side, and the DCs framework assumes that market endeavors (of sensing/sense-making) are a determinant cognitive and managerial stimuli for altering the *PACAP and RACAP* and reducing the path dependency’s effect (Engelman *et al.*, 2017).

In this context, Fernandez-Moya and Fernandez-Perez (2019) and Rodríguez-Serrano and Martín-Armario (2019) claim that a “favorable” organizational culture for enhancing RACAP is a seminal element on building an organizational learning capability and subsequently for the renewal of human capital; which, in turn, is fundamental for the DC dissemination (Mohamud and Sarpong, 2016). An organizational culture’s architecture aligned with the Kanter’s (1983) notion of *integrative organization*, is postulated by Rodríguez-Serrano and Martín-Armario (2019) because of the virtues of four integrative cultural behaviors, namely, openness to change and learning; focus on a continuous search for information; audacity; and, risk-taking. Moreover, it is claimed as anchors of integrationism, two seminal cultural dimensions, also advocated by Teece (2019), a *market orientation* and an *entrepreneurial orientation*. These dimensions are perceived as critical for the pursuit of two different (but cumulative) models of aprioristic learning: the *explorative and exploitative* one (Gonzalez and Melo, 2019). The first (exploration) relates to the

recognition and *capture* of new apprenticeships, while the second (exploitation) referring to the *assimilation* and *applicability* of knowledge as a market response; moreover, the latter constitutes the foundation for further and/or more accelerated up/reskilling and for the signaling within the organization of specific CR (Gonzalez and Melo, 2019). Mobility and potential transferability of DCs are then profoundly dependent on the strategic apex's prior cognitive and managerial capabilities, as to the understanding of the need to develop a prior learning through the joint adoption of an explorative model for accomplishing higher PACAP and RACAP, which is associated with the gaining of sensing and sense-making capabilities also referred in to by Weber and Tarba (2014) and Abrantes (2020a) as a sense of alertness (as a component of a capability – strategic agility), which is explanatory of the importance of market and entrepreneurial orientation as critical behavioral dimensions for higher preparedness for, and more acknowledge about, for the effective sharing of multiple capabilities organization wide.

Methodology

As a comparative case study research, the methodological rigor asserted here (of design and methods) complies with the “minimum standards” pronounced by Krehl and Weck (2019), as to the circumscription of the objectives, approach and research questions (RQs), case study selection strategy and potential trade-offs. Data that is exposed here is scrutinized in the light of CA instrumentalizes Gioia *et al.* (2013) qualitative data analysis (QDA) procedure with regard to *axial coding*, furthermore anchored on the *Weber protocol* to circumvent bias as to the analytical generalizations made on the topic (Weber, 1990). In addition, the updateness of this CA methodological procedure is corroborated by other qualitative research projects in different quadrants within the social sciences domain (Elsahn *et al.*, 2020; Crosina and Pratt, 2019; Vuori and Huy, 2016).

Hence, fitting Yin's (2003) Type 4 case research, a multiple-case design with embedded UAs is built with the purpose of reaching the saturation point of data as to the triad of capabilities under observation, i.e. NC; R&DC; PIIC as critical ones to adapt to VUCA business ecosystems (Bickman and Rog, 2009; Strauss and Corbin, 1998; Mason, 2010; Myers, 2013).

The collection of data is focused on the Portuguese MMI sector, and within this sector, four internationalized SMEs were instrumentalized because of the rationale presented at the initial section. Here, the selection of participants per sampled firms (Table 1) is circumscribed to the strategic apex of the firms (F) because of their informant-potential to reach the point of saturation within the gathered data.

In Table 1, the hermeneutic UAs identify the events of data collection, of *vis-à-vis* authorized data collection with each participant (P_n) at the Cávado Region in the North of Portugal, using an interview guide with open-ended questions (prompts) iterated across the participants and complemented with emerging questions (probes) for triggering the further development of data with a non-serial order of collection based on the participant's availability.

The participating organizations were randomly labeled from F1 to F4. Two being medium-sized (F1; F2) and the remaining ones small-sized enterprises (F3; F4). F1 to F3 belong to Segment 2 of the MMI (i.e. *metallic and electric products*), while F4 to Segment 3 (i.e. *transportation equipment*). The low coverage of Segment 1 (i.e. *basic metallurgic*) among the Portuguese organizational ecology led the authors to exclude the last segment from this study (Banco de Portugal, 2017). In aggregate, the four sampled firms represent 0.93% of the sectors' annual revenue and 0.04% of the whole organizations in all segments and using 1.1% of the active population of the MMI. The distribution of sampled firms per segment

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follows their representativeness level, in which, metallic and electrical products (Segment 2) accounts over 90% and transport equipment (Segment 3) approximately 7% of all firms in the MMI (Banco de Portugal, 2017).

A semi-structured *vis-à-vis* qualitative enquiry is conducted upon seven key-informants in the targeted firms comprising of a blending of prompt/probe questions. The analysis of transcribed data encompassed the usage of an a priori hierarchical design. Here, Miles and Huberman's (1994) CA general framework is combined with Gioia *et al.* (2013) data codification method. As to the latter (data codification) to avoid bias, Weber's (1990) protocol is applied to data manipulation. Thus, the QDA methodological procedure is designed in a dual-tiered codification fashion (first-order and second-order coding). The first-order coding corresponds to the matching of coding units, while the second-order to their theoretical dimensions. Each capability under observation was attributed a coding unit associated with a code identification (Cid). Evidence of the observed capabilities' s transference where codified by the annotation of respective and unique quotation labels.

In this context, four RQs were formulated deriving from its aims (A_n):

RQ1. What relationship-building aptitudes are transferred across the MNC?

RQ2. How is research and development upskilling/reskilling prioritized as to its dissemination?

RQ3. How is NPD introduced in the marketplace(s)?

RQ4. Do these capabilities in *RQ1*, *RQ2* and *RQ3* suffer adaptive mutations?

A diagrammatic representation of the research framework draws the intertwining of the components in the empirical test.

A general aim (A1) addresses the phenomenon of capability-diffusion, accompanied by a specific aim (A2) and *RQ4* focused on the observation of potential mutations in the three capabilities. The remaining RQs address separate capabilities. *RQ1* targets the dissemination of NCs, while *RQ2* and *RQ3*, research and development and product-levels innovations.

Furthermore, the topic (capability-diffusion) directed the authors through the establishment of a set of philosophical assumptions of ontological and epistemological nature related to the mobility of these capabilities. First, it is assumed a transferability processes are triggered whether by the headquarters (HQ) or a subsidiary (S), comprising multiple points of destiny and

Firm	NUTS	UAs		Method	Collection participant per firm			
		Id	UA/firm		Order	IQs	Id	Position
F1	112-Cávado	UA1	2	OEI	7	Probes/prompt	P1	CEO
F1		UA2	2	OEI	2	Probes/prompt	P2	KAM
F2		UA3	2	OEI	6	Probes/prompt	P3	Dir
F2		UA4	2	OEI	1	Probes/prompt	P4	KAM
F3		UA5	2	OEI	3	Probes/prompt	P5	CEO
F3		UA6	2	OEI	4	Probes/prompt	P6	KAM
F4		UA7	1	OEI	5	Probes/prompt	P7	D/CFO

Table 1.
Partaking firm (Fn)
and participants (Pn)

Note: (CEO – Chief Executive Officer; CFO – Chief Financial Officer; Director; IQ – Investigative question; KAM – Key Account Manager; Nomenclature of Territorial Units for Statistics; OEI – Open-ended interview; UA – Unit of Analysis; P-Participant)
Source: Own elaboration

involving multiple transferors and/or transferees. Second, the transference may entail reciprocity (i.e. bi-directional transference), and/or discretion and partial selection of transferable properties. Third, it is assumed that transferability is not instantaneous, as the capabilization is a gradual phenomenon, which requires a time from its initiation (t_0) until its effectuation (t_1). Finally, as the marketplaces are perceived as unequal but also in constant change, it is also assumed a Teecean reasoning in which a transferred capability may be mutated either by reconfiguration or renewal. Thus, it is supposed that a globally-distributed capability is differentiated morphologically in sophistication and adaptability along its geographical span.

According to the research framework presented in Figure 1 and the latter assumptions, then a set of propositions (P_n) subsequently deriving from the RQs were fashioned prior the data mining:

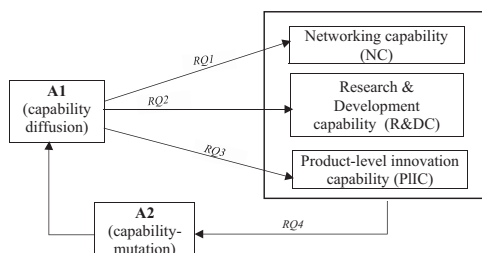
- P1.* Relation-building capabilities related to market stakeholders (clients and suppliers) is partially disseminated and constrained by the governance model.
- P2.* R&D is mostly uplifted internally and/or by the demand-side than jointly with other parts (e.g. incumbents or upstarters, research institutions, academics, communities of expertise and other business/social relations).
- P3.* NPDs are simultaneously introduced in multiple markets, despite at a dissimilar tempo and with customization.
- P4.* Capabilities suffer casuistic mutations, whether partial (reconfiguration) or total (renewal) depending on the perceived value in the market or ACAP of transferees and/or challenges faced at the general environment and industry-specific business ecosystem.

The propositions (*P1* to *P3*) are interrelated to the testing of capability-diffusion while *P4* to the subsequent phenomenon of mutation, and each proposition is congruent to a separate RQ with an equal numbering ($RQ1 \cong P1$; $RQ2 \cong P2$; and so forth). The next section exhibits the features of the QDA test, as the coding categories/units and the outputs of data according to the methodological choice of treating manifest content disclosed above in this section.

Data analysis

Target population and sampled firms

Within the MMI sector, the sampled firms (Table 1) match the distribution of the MMI as mentioned in Sections 1 and 3 with a representativeness level allowing further inferences in terms of analytical generalization as presented in the research design in the previous section.



Source: Own elaboration

Figure 1.
Research framework
for capability-
diffusion testing

RIBS

Further internationalization-related (secondary) data is presented below for contextualization of the breadth of capability-diffusion's potential (Table 2).

It may be observed that the sample firms are solid incumbents with a mature foreign establishment track, expressed both in longevity figures and number of marketplaces' commitment, which constitute a stable scenario, which is favorable for the testing of capabilities diffusion, especially concerning the *RQ3* and *P3* (Table 3).

Data mining

For the coding of manifest content, a codification system was designed with three coding categories, namely, dimensions, themes and units. The first (dimensions) referring to the topics under analysis (diffusion and mutation), the second (themes) refers to their attributes of the GDCs and the third (units) to the constructs or capabilities under observation (Table 4).

The QDA methodological procedure entails the usage of the coding units through the assessment of the content obtained from the participant's narrative, which is subsequently

Table 2.
General description
of the partaking
firms (F1–F4)

Firm	Classification	Foundation	First abroad	Revenue	Equity (M Eur)
F1	Medium	1993	1997	38.88	12.5
F2	Medium	1968	1985	89.28	0.3
F3	Small	1994	2012	19.91	17.99
F4	Small	1987	1987	3.04	0.6

Note: (Revenue is expressed in Millions of Euros per year (M. Eur/Year); and Equity in M. Year)
Source: Own elaboration

Table 3.
Case-study:
aggregated data
(F1~F4)

Firms	No. markets	Foreign markets		RA	RA/TR (%)
		Longevity (<i>n</i> years)			
F1	4	22		15.78	40.59
F2	16	32		63.9	64.9
F3	5	3		57.94	58.55
F4	20	8		2.10	40.86

Note: (RA – Revenue Abroad; TR- Total Revenue)
Source: Own elaboration

Table 4.
GDCs – coding
categories

Dimensions	Themes	Coding units
Capability-diffusion (Cd)	Cognitive (Cog)	Networking (NC)
Capability-mutation (Cm)	Managerial (Man)	Research and development (R&DC)
	Incremental (Inc)	Product-level innov (PIIC)
	Regenerative (Reg)	
	International exploration (Iexplor)	
	International exploitation (Iexploi)	

Source: Own elaboration

associated with the conceptualizations along the interview. Whenever a coding unit or a construct is uncovered in the transcript, then it is materialized into a quotation as evidence of the observed phenomenon.

Quotations were used as an instrument for the synchronization of meaning (i.e. sense-making) to enlighten the capability-diffusion on the focal industry and cases. Thus, each piece of information transmitted from the participant potentially codifiable (*signifier*) may be converted into the focal concepts (*signifieds*) (Gioia et al., 2013; Krippendorff, 2004; Miles and Huberman, 1984). Furthermore, the causal relations built between constructs and analytical generalizations derived from the three axial codes designed for testing the dissemination inside the organization, comply with Weber's (1990) protocol for ensuring both internal and external validity.

Initially, a word crunch was applied according to the truncations below (Table 2) for the two dimensions of diffusion and mutability:

Here, the relative frequencies of the word crunching exhibited a fairly equal distribution per medium-sized (F1; F2) and small-firms (F3; F4) in both dimensions, despite the participants verbalized in their speech the concern a higher concern has to the first dimension (diffusion), as the aspects of transference and absorption of competences were dominant in the set of quotations (47%) with 53 records out of 114.

Although the data exhibited in Table 5 (word clouding) is deprived of a meaning system, it is a pure quantitative output with no interpretation by the outside-researcher, delivering frequencies of verbalized words regardless of its meaning, and therefore, not comprised in the QDA analytical procedure defined in the Section 3 in terms of theoretical matching of signifiers/signifieds (Table 6).

Truncation	F1	F2	F3	F4	<i>n</i>	<i>F</i>
Transfer (1)	32	4	16	1	53	0.47
Absorb (2)	2	9	0	0	11	0.1
Adapt (3)	15	28	2	2	47	0.41
Renew (4)	2	0	1	0	3	0.03
Total dimension Cd (1); (2)	34	13	16	1	–	–
Total dimension Cm (3); (4)	17	28	3	2	–	–

Table 5.
Word clouding (cd
and Cm)

Source: Own elaboration

Codes	F1			F2			F3			F4			F1–F4		
	<i>N</i>	<i>f</i>	<i>F</i>	<i>n</i>	<i>f</i>	<i>F</i>	<i>n</i>	<i>f</i>	<i>F</i>	<i>n</i>	<i>f</i>	<i>F</i>	<i>n</i>	<i>f</i>	<i>F</i>
Cognitive	34	–	0.19	30	–	0.17	52	–	0.29	5	–	0.03	121	–	0.68
Cog/NC	28	0.82	0.16	14	0.467	0.08	32	0.62	0.18	0	–	–	74	0.62	0.41
Cog/R&C	6	0.18	0.03	16	0.533	0.09	20	0.39	0.11	5	1	0.03	47	0.39	0.27
Management	22	–	0.13	5	–	0.03	20	–	0.11	9	–	0.05	56	–	0.32
Mgt/PIIC	22	1	0.13	5	1	0.03	20	1	0.11	9	1	0.05	56	1	0.32
Total (<i>N</i>)	56	–	–	35	–	–	72	–	–	14	–	–	177	–	–

Notes: *N* represents the number of observed quotations; *f* the relative frequency per participant (within themes “cog” or “mgt”) cognitive or managerial capabilities; *F* is the relative frequency in the overall of observations

Source: Own elaboration

Table 6.
Frequencies of axial
coding of GDCs

RIBS

Hence, the QDA process required the usage of complementary tools. Thus, a quotations query is applied with the output diagrammatically represented in Table 5, to triangulate data outputs for confirmatory purposes. Here, each participant corresponds to a UA. F1 to F3 counted with two participants each ($UA(f1, f2, f3) = 2$) and F4 a single one ($UA(f4) = 1$), as in principle F4 contains (supposedly) as two UAs, as the chief executive officer it accumulates temporarily the responsibility of chief financial officer of the firm.

The level of coding reveals an average of 44.25 per firm (and 25.29 per UA) comprising an aggregate of 177 quotations or signifieds. The sum of F1–F4 accounts a relatively similar distribution (F1 = 0.42; F2 = 0.2; F3 = 0.41; F4 = 0.08) with central dispersion figures in coding of $S = 0.143$ and $S2 = 0.02$.

Firms F1 to F3 possessed a higher incidence on cognitive capabilities in F3 (max = 52) and conversely F4 higher figures of managerial capabilities. Within the cognitive capabilities, F1 and F3 encompass a significant number of quotations on NCs than on research and development ones. On the contrary, F4 coding on cognitive capabilities illustrates higher figures of R&DC than NC, such as F3. Thus, two medium-firms (F1 and F2) and a small-firm (F3) demonstrate their orientation toward cognitive capabilities, which encompass all sampled cases from the Segment 2 (metallic and electric products) of the Portuguese MMI sector, while the sampled firm from Segment 3 (transport equipment) is driven toward the managerial capabilities here tested (i.e. PIIC). We recall the selection of these types of GDCs coming from the theoretical review as being asserted by other scholars, their virtues and importance under VUCA business environments.

Additionally, the association of categories, as the second-order coding initiated in Table 5 with themes-coding units, is repeated between dimensions and coding units.

First, it is observed that all firms possess both practices of Cd and Cm phenomena. Second, data in Table 7 demonstrate a low-level of correspondence between general coding and transferability-related/mutability-related coding. Third, the figures of mutability exceed the ones of transferability, which indicates that reconfiguration or renewal may not occur at every effective transference moment and/or an independent process co-occurring beside effective transferability flows. The latter issue (i.e. independence of capability-mutations, from its mobility) is not core to this study, and therefore, it may constitute a research angle to be explored in further research endeavors.

Furthermore, F3 as the firm with the highest intensity of coding expressed in quotations is also the one with the highest association to the transferability phenomenon (Cd) and the second-lowest with regard to mutations (cm). However, the differences in figures of the cross-tabulations are not significant. In general, it is observed that co-occurrence (Table 6) is rather incipient, and therefore, researchers refrained from using the Cooc matrix for triangulating data for confirmatory purposes. Additionally, intra-subsidary transferability revealed a lower incidence (0.35714) than headquarters-subsidary one.

Table 7.
Cross-tabulation of
dimensions
(diffusion; mutation)
with coding units

GDC	N	F1		N	F2		N	F3			N	F4	
		R&D	PII		R&D	PII		R&D	PII	R&D		PII	
Cd	2	–	2	–	1	–	14	3	7	–	–	1	
Cm	5	–	3	3	4	5	4	2	3	–	1	6	
Cd/N	0.01	–	0.01	–	0.01	–	0.08	0.02	0.04	–	–	0.01	
Cm/N	0.03	–	0.02	0.02	0.02	0.03	0.02	0.01	0.02	–	0.01	0.03	

Source: Own elaboration

Findings

An ample cooperation is noticed across the firm's structure revealing a positive intra-organizational integration of organizational main functions and their underlying capabilities. Cross-enterprise integration is mostly observed with institutional clients, as clients' inputs to the focal firms (F1–F4) are instrumentalized within the radius of R&D activities.

An accentuated level of corporate centralization is observed as capability-transferences flow is mostly encountered from HQs to subsidiaries (S), discerning the adherence of the MMI to the Japanese model (Proposition 1/*PI*) of the *central hub* or a *hub-and-spoke model* with the HQ assuming the role of central connector, being the formalized power or the firm's authority in a top-down transference regime (Ghoshal and Bartlett, 1990). Thus, a cooperative sharing culture is acknowledged, yet mediated to a great extent by the intervention of the HQs. Reciprocal transference intra-subsidiaries is not the dominant paradigm, yet with evidence of its existence. Bi-directional transference seemed non-simultaneous determined a different time intervals and duration of the transference.

The typology of capabilities mostly from HQ-S privileged NCs, which tended toward the subset of relation-building ones (*RQ1; P1*). Priority is given to R&D capabilities over open innovation projects, which seem to exist at a joint effort with the customer-base but then triggered by the latter's technological needs of evolution (*RQ2; P2*). The inputs from local clients determined the R&D capabilization at the focal subsidiary and shaped the corporate HQs R&D's agenda. Here, the capabilization seems to follow a reversed route (from S to HQ). The capability-diffusion as to the product-level innovation follows an establishment chain, targeting first the focal customer (or co-innovating partner), then spreading through the marketplace and region (*RQ3; P3*). Again, it flows mostly from HQ-S, being emphasized as a standardization of skills, which is typical of organic structures. In this sense, the innovation capabilities are related to the adoption of their own PIIcs and their accommodation in the portfolio or products/services (*R4; P4*), denoting a reconfiguration of capabilities with the purpose of market-specific customization.

Despite the phenomenon of capability-diffusion (Cd) uncovers the attempt to foster cooperation, a centralized structure comes with the downside of loss of autonomy by the subsidiaries, which is deterministic of fewer intra-subsidiary sharing (*PI*). Thus, capabilization-diffusion is here asserted to be hampered by the firm's architecture. The firms (Fa–F4) adopt an identical organizational design, a *professional structure* (as further discussed at the conclusions). Moreover, a gap is perceived between capability-possession and capability-diffusion. The speech of the participants presented a breadth of capabilities with a minor part being disseminated across the firm. This clearly calls for the design of a capabilization diffusion model, especially when, the signifieds of participants in this research corroborates with DCT arguing that a DC have an intrinsic potential to influence other capabilities including the operational ones.

Limitations and future research

Within the strategic management field, the DC framework has emerged in the past two decades as a relevant body of theory enhancing the success of international businesses through an organic growth mode. Although, scholarly research gravitates mostly around holistic discussions exploring the microfoundations and deployment of firm-level capabilities. Thus, the amalgamation of definitions in the DCV seems to be entangled in a web of conceptual redundancy, terminological heterogeneity and semantic blurriness, as corroborated by other scholars. For instance, some capabilities with a hazy theoretical circumscription touch the thresholds of others, such as the patching capability (Eisenhardt and Martin, 2000) or improvization capability (Cepeda and Vera, 2007) or the NC

(Weerawardena *et al.*, 2007) and the alliance management capability (Eisenhardt and Martin, 2000).

We argue that the theoretical advancement of this field lies not solely on iterations and tests of replicability, which may imprison its development, but on pursuing new lines of investigation, such as the ones related to topics as, processes and systems of dissemination, ecosystems of capability, capability clusters, capability-building communities and their spill-overs to other quadrants of society, both theoretical and methodological contributions. For instance, concepts such as, transferability, mutability, regeneration, remain deprived of a universal and unequivocal distinction. Likewise, within the theme of capability-diffusion, other relevant conceptualizations such as transitivity and reciprocity are widely unexplored.

Furthermore, on the methodological side, OCs' literature holds a wide potential as to the exploration of the dearth of research on the modeling of GDCs but also on scaling and measurement aspects with clear and universal metrics (Helfat and Peteraf, 2009; Rothaermel and Hess, 2007). The awareness of an absence of a solid methodological ground appeals, therefore for the deepening of research endeavors, theoretical, methodological, on their intersection, using different methodological approaches and methods and accounting the interdisciplinarity potential within the social sciences spectrum.

Conclusions

Recognizing the established intertwining in prior literature of capability-possession and firm's competitiveness, and a general lack of studies with this nature, the authors immersed into the mapping of effective capabilities' transference, due to their assumed impact on the establishment of FSA and future economic rents. Thus, the contribution of this research lays both on the targeted gap but also on the singularity of the results and findings below exposed.

Substantial steps were taken with this study as to the comprehension of how MNCs scatter their OCs, as the results deriving from the test at the MMI sector were quite clear, as to the interpretation of their meaning. The uniqueness of this study resides in the unravelling of:

- The influence of the governance model on the agility to administer the GDCs diffusion.
- A dyad of co-existing capability-dissemination approaches (the *generalist* and the *idiosyncratic*); in which, one (the idiosyncratic) is conflicting with the structure's configuration (i.e. a *professional burocracy*).
- The urge for the fashioning of a *global capability's administration model (GCAM)* model, as all the tested firms (F1–F4) lack on a systematic approach for the worldwide administration of their competencies and combinative capabilities, which has direct repercussions upon their competitiveness and on the current/future organization's wealth.

Thus, as the latter has inherent implications on the industry's (MMI) *Ricardian* relative comparative advantage overseas; and subsequently, on the firm-level competitiveness (FSA) of its incumbents, it is here nurtured a sense of urgency for the launch of a prompt course of action. Furthermore, it is here drawn a concrete path for practitioners in the industry and future avenues of research within the DC framework.

Regarding Aim 1, as to the rendering of the general capability process in the sector, the participating firms revealed a structural agility to fully transfer the three tested DCs across

organic units (*aka*, subsidiaries). Furthermore, on the transferee-side, it was observed a mutation of their features upon arrival, tailoring them toward market-specific requirements. Thus, such capabilities were perceived to be, not solely transferred, but adherent to a Teeccian “reconfiguration” (or partial renewal), in which, their morphological characteristics were adapted to achieve competitive gains and strategic fitness to the hosting business ecosystems.

The CR at the transferee’s side are noticeably accounted for prior to the effective capability diffusion, as the participating firms in this study seemed to adopt a dual diffusional approach (A1), a *generalist* (as an “industry recipe” for all organic units) and an *idiosyncratic* one, matching the CR of the transferees (Arora *et al.*, 2020; Abrantes, 2020b). The first (generalist approach), denoted an endowment of capabilities through a blind dissemination mode, disregarding the transferee’s necessities at each organic unit, being self-centered on the alignment toward the goals of the firm, as verified with the transference of NCs and PIICs. Furthermore, this transference mode it was observed to be intrinsically dependent upon the organizational structure and governance model with an accentuated feature, the organizational design seemed to constrain the transferability process and dissemination. Here, the participating firms possess an identical structure configuration, a Mintzbergian *professional bureaucracy* one driven toward the *standardization of skills*, in which, the coordination of international businesses is highly centralized at the corporate HQ functioning as a central connector (a hub), identical to the Japanese governance model (“hub-and spoke”) (Lunenburg, 2012). Subsequently, a spurious relation was observed in this (generalist) approach between the CR of the transferee and the capability-delivery (CD) by the transferor, concerning (two out of three) of the tested GDCs: NCs and PIICs. This constitutes a capability-gap, as an existing discrepancy of $CR_{(x)}$ to the $CD_{(y)}$ of both NCs and PIICs is materialized into a deviate transference of a capability y instead of a required x ($CR_{(x)} \neq CD_{(y)}$), a partial transference of substantially lower proprieties ($CD_{((1-x); x<1)} < CR_{(x)}$) and a null transference ($1 - \sum(CR_{(x)} - CD_{(x)}) = 0; CD_{(x)} \rightarrow 0$).

Concurrently, an idiosyncratic approach (Aim 2) reveals a selective diffusion, in which, capabilities are conveyed in a discretionary mode from the transferor to transferee because of their greater fitness to market specificities, as noticed with the R&DC diffusion. Here, a true relation is observed as to the R&DCs. Ergo, this approach holds a mismatch to the organizational design of the participating firms, which are committed to the diffusion of homogeneous bundles of capabilities across the whole organization. A true relation is observed in the idiosyncratic approach as to the transference of R&DCs. Yet, the corporate HQ assume a moderating role, dictating on a top-down manner the transference of the R&DCs and being rather parsimonious as to the cross-organizational disclosure of sensitive-knowledge whether with the origin on closed-system’s research (as the dominant paradigm) or on open-system’s research involving their customer-base.

As to the directionality, capabilities were noticed to be diffused in a bi-directional and non-simultaneous manner with the central-hub (the HQ) orchestrating and monitoring their dissemination. Here, it perceived some reciprocation, as the interchanging process accounted in some organic units a dual role as transferors and transferees. The transference’s channel span has though not been measured, as the established ties across organic units (and the underlying number of involved organizational stakeholders per unit) were not under the scope of this investigation constituting then an avenue for heuristic studies concerning the transference channels and their range of (uniflex/multi-flex) ties. Furthermore, it is observed that GDCs transference is non-synchronized (or non-simultaneous) as to the time interval and length.

A positive structural agility to formalize the transference and local mutation of capabilities, is conversely accompanied by an operational non-agility regarding the mechanisms of practice/transference. This operational rigidity is materializable in the greater extent of effective transferees occurring mostly from HQs to subsidiaries through a centralized regime. Thus, the

latter is hampering the subsidiaries activities and the fostering of a global *collaborative culture* with the *motivation and willingness to integrate and share knowledge* (MISK) as a ground intercultural framework, described in prior literature as being foundational of the collective interests over individual knowledge-holders, and contributing decisively to the intensification of the flow and quality of sharing (Gonzalez and Melo, 2019, p. 1203; Zhang and Cao, 2018). Here, Rodríguez-Serrano and Martín-Armario (2019) research on born-global SMEs asserted that the transference of GDCs is decisively influenced by the shared culture and intra-communicative interaction (aka *integrative culture*) across organizational stakeholders, which, in turn, is essential for the recognition, assimilation and application of knowledge. With regard to the success of the transferability process, it may then be assumed a double loop of responsibilities, clearly applicable to the participating firms. The first loop is related to the corporate responsibility of executive officers toward the establishing of a favorable culture of cooperation, adopting a leadership and governance mode most favorable to capability-building and wide-circulation of, including intra-generational transference (as to the case of family-business) and intra-subsidiaries transference (Fernandez-Moya and Fernandez-Perez, 2019). The second loop refers to each organic unit's duty toward their own capabilization path, as prior capabilities (or their RACAP) are essential for recognizing new CR and signaling dissimilar prerequisites from other areas of the organization. This means managers and remaining personnel at unit-level are prominent agents revealing hiatus, emergent trends and opportunities for competence-building and mapping CRs.

It is recommended that a triadic course of action should be undertaken to overtake such operational rigidity's obstacle, to attain an efficient dissemination route and subsequent build on competitive-advantages. First, it is proposed that the flexibilization of the international cross-coordination mechanism, regarding the currently adopted governance model of a *federative management organization* (Ghoshal and Bartlett, 1990). This need is especially noticed to one particular business process (i.e. capability's transferability) for both functional and geographically dispersed organic units. Organizations are proposed to empower the middle managers' line to a joint-administration of selective capability-transference, shifting partially the dominant paradigm toward an idiosyncratic approach, in which, the determination of competencies endowment is casuistically accounted, aiming at targeting the most suitable to country/subsidiary-specificities.

Second, consolidate human capital by acting upon a seminal component of the organizational capital (the shared culture) and re-shaping their espoused norms of cooperation. A second concrete proposal is the creation of structures of stakeholder's cross-cooperation and networking, with informal and independent structures (e.g. professional discussion groups or communities of expertise) to reduce the single reliance upon the formal channels of learning, commonly affected by a myriad of corporative challenges, as internal resources competition or constraints and managerial prioritization of decisions, based on the MISK principles. Here the notion of "cross-cooperation" entails the whole supply chain network members as an open-system of informal sharing.

Finally, this research brought to the light the unavoidable prominence of the design of a GCAM, considering the dissimilar CR and aiming at fulfill specific capability-gaps across SBUs and subsidiaries, while interpreting the organization as a system, therefore tackling major intra-organizational capability dissemination's hindrances:

- Un-optimized economies of learning.
- Competitive constraints.
- Segmentalist organizational cultures.

Such model (GCAM) may furthermore, shape the spectrum of capability diffusion, plus the agents involved in its administration and the mutability processes, with functional and geographical mobility (i.e. GDCs), which have transversal managerial implications as to a broad range of issues, as the structure, resource and competence-base, firm-specific advantage, strategy design and returns. Thus, the latter constitutes a clear contribution for the advancement of the knowledge surrounding the transference and administration of GDCs within MNCs with a profound impact on operational, financial and strategic goals and organizational success and future wealth.

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