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Post-merger integration

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Abstract

This article discusses post-merger integration (PMI) and the trade-off between the economic benefits and costs that arise when organizations merge under a new organizational structure and reconfigure their businesses and resources. To reconfiguration scholars, PMI is a crucial tool for firms to reconfigure resources, product lines, and business units to adjust to internal and external environment needs. Other scholars focus on organization design, shedding light on structural integration following an acquisition and exploring key trade-offs of this process. We integrate reconfiguration and organization design aspects on choices of what and how to integrate after mergers and acquisitions, questions that have often been treated separately. We then outline how to design and conduct empirical research on PMI. We conclude by offering ideas for future research.

Keywords: Post-merger integration, Reconfiguration, Structural integration, Corporate strategy, Autonomy-coordination dilemma

Looking at the growth strategies of iconic firms like L'Oréal, Cisco, Johnson & Johnson, AB Inbev, and Cemex, there can be little doubt that mergers and acquisitions (M&A) are a powerful tool for achieving corporate growth. Done well, M&As provide a strong basis for a firm's growth and survival. They enable merging firms to reconfigure their businesses, by which we mean adding, redeploying, recombining, or divesting assets and resources with the goal of strengthening the resource base (Karim and Capron 2016). Done badly, they can end in decline or failure, often creating more headlines than value for the firm. Indeed some studies suggest that 70% of deals fail to achieve their objectives (for a review, see King et al. 2004; Halebian et al. 2009).

Acquisitions are a crude means of obtaining specific resources in pursuit of growth. They often come with unneeded resources that the acquiring firm is obliged to restructure and divest during the post-merger integration (PMI) phase. The targeted resources will in turn need to be redeployed across the merged firm to yield synergistic benefits. The core question remains whether the acquiring firm has the capability to integrate the target to an appropriate extent and within a reasonable amount of time.

The process of integration may occur within the target, in the acquirer's existing businesses, or in a newly formed business unit. It can happen soon after the acquisition or be phased in over time. Ultimately, value creation from an acquisition will require new resource creation that draws on the existing skills and resources of the newly combined firm. Without the integration to generate new resources, the acquirer will almost always have overpaid for a target that merely continues to operate as before, the purchase of its shares being akin to a passive investment in the stock market.

Both academics and practitioners stress the crucial role played by PMI in the success of M&A (Zollo and Meier 2008). The PMI process typically comes up against obstacles related to capturing synergy, client disruption, structural integration, employee retention, loss of identity and/or independence, customer retention, emotional trauma, loss of status, and learning challenges. These are so diverse in nature and magnitude that they have given rise to multiple definitions of PMI (see discussion in Graebner et al. 2016). Here, we define post-merger integration as *the process that unfolds in the aftermath of the deal closure to reconfigure merging firms by redeploying, adding, or divesting resources, lines of products or entire businesses, in order to achieve the expected combination benefits*.

Accordingly, we focus on two core questions: (1) *what* do firms integrate post-merger, i.e., which resources, product lines, or businesses are reconfigured in order to create the expected value? and (2) *to which extent* do firms pursue structural integration (vs. autonomy) to achieve an optimal level of reconfiguration?

We begin by outlining the evolution of the academic literature targeted at answering these two central questions. To do so, we draw on two complementary streams that developed in parallel and have been applied to the analysis of PMI. Reconfiguration scholars view PMI as crucial for firms to reconfigure resources, product lines, and business units to adjust to the internal and external environment—thus focusing on the locus (*what*) of PMI. Scholars with a focus on organization design use PMI as a setting to shed light on structural integration choices and explore key trade-offs in organization design choices—i.e., the *extent* to which firms structurally integrate. We explore the assumptions underlying existing literature in these two streams, as well as units of analysis and key constructs in the domain. We discuss the challenges of designing and implementing empirical studies on PMI and how scholars have tackled the topic. We conclude by outlining the implications of previous findings for organization design as well as potentially interesting directions for future research.

In this primer, we take a step towards integrating the fragmented research on PMI by bridging research on resource reconfiguration and organization design. Other work on PMI has emphasized learning and more sociocultural perspectives, going beyond the scope of this paper (for a comprehensive review of PMI studies, see Graebner et al. 2016).

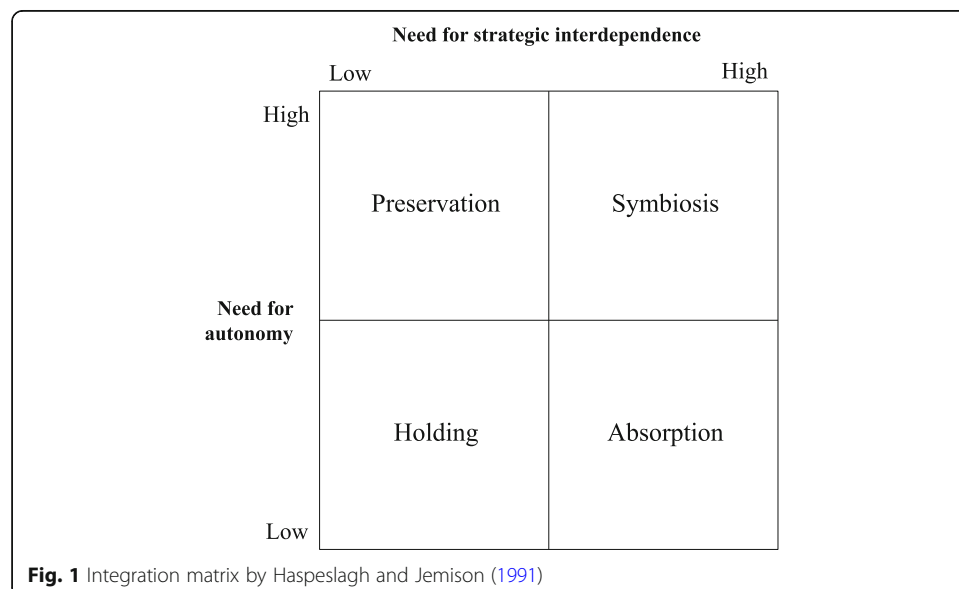
Evolution of the literature on PMI

PMI and its challenges for managers were first discussed by scholars who focused on the M&A phenomenon and adopted a holistic, practitioner-oriented approach to the process. The traditionally held belief among practitioners was that targets were to “disappear” and fully be integrated by an acquirer, or that the integration choice would rely on rudimentary characteristics such as size of targets. Haspeslagh and Jemison (1991) cast doubt on this view and adopted a contingent view; the ultimate goal of the PMI process being to find the most effective way to create value with a new bundle of resources that is formed when two organizations merge, while balancing the economic benefits and organizational costs involved. In their seminal work, Haspeslagh and Jemison (1991) place the transfer and application of strategic capabilities, based on the value-creation logic pursued by the acquiring firm (consolidation, extension, exploration) at the heart of PMI. Capability transfer can take the form of operational resource sharing as well as the transfer of functional and general management skills, each with its respective organizational challenges, requiring different levels of structural integration.

Considering both the strategic need for capability transfer and the organizational needs of the target, Haspeslagh and Jemison (1991) synthesize the implications for PMI through their four-alternative “integration matrix” (Fig. 1): Considering the need for strategic interdependence of acquired and acquiring firm and the acquired firms’ need for organizational autonomy to operate optimally, acquirers choose between absorption, symbiosis, preservation, and holding. Acquirers will choose to absorb an acquired target if the target does not require high autonomy to pursue its functions, and if there are strong interdependencies between target and acquirer. Mergers are characterized as symbiotic when neither of the merging firms are dominant in the newly formed entity, and rather mutually support each other’s endeavors. This PMI approach is beneficial if interdependencies are high and the targets’ capabilities require more autonomy to be preserved. When interdependencies are low and autonomy is important to maintain targets’ capabilities, acquirers can choose to nurture targets to pursue their strategic goals, “preserving” the acquired firm. In other deals, acquirers choose an approach referred to as “holding,” where the benefits of a transaction might mainly stem from sharing financial and management resources, without pursuing any further integration.

Acquirers can make mistakes at either end of the integration process. Where a firm is simply too slow or cautious about integrating the target for fear of disrupting its existing organization and the people that created the target’s value (preservation), it will end up having paid a premium for resources it does not use. Other firms end up destroying capabilities by being overly aggressive, restructuring and integrating the target’s resources too quickly or too coarsely (absorption).

The seminal contribution of Haspeslagh and Jemison (1991) paved the way for a generation of M&A scholars who then focused on unpacking the PMI process. With a focus on capability transfer, their work took a resource-centered stance that was rooted in practitioners’ needs as well as the emerging resource-based view of the firm (Penrose 1959), which gained traction in the mid-1990s, complementing more traditional industrial organization-based studies. Indeed, until the mid-1990s, most studies on M&A in the strategy domain had been influenced by the



works of industrial organization scholars and the diversification literature (Rumelt 1974) and examined the relatedness-performance relationship in M&As.¹

Shifting the focus of analysis from industry to resource level, the resource-based view of the firm (RBV) became a key lens through which to study M&A as a means of combining bundles or resources from different corporate parents to create value. This perspective inspired more applied and empirical scholars to further explore the RBV contribution. By the late 90s, researchers had picked up on the RBV in the context of M&A, alliances—and PMI.

In parallel, researchers started analyzing the role of organization design choices in the context of PMI, drawing on a different tradition. In the early days of the strategy field, the prevailing view in the literature was that strategy was enabled or constrained by the firm's structure (Chandler Jr 1962); in turn, structure could influence strategy. This approach also showed to be fruitful to analyze M&As which yield combination benefits only if the merging firms manage to set up a structure conducive to the exploitation of those synergies.

Key PMI decisions

Merging bundles of resources: what should be integrated to reap combination benefits?

For firms, it is important to understand what (which targets, business units, resources and assets, product lines) they should integrate. Integration choices may not affect the whole of an acquired firm at the same time and to the same extent. Academic researchers therefore assess integration choices not only at the business level but also on smaller levels of analysis.

Among the terms coined to account for post-merger changes in the stock of resources, product lines or businesses are “resource redeployment,” “restructuring,” “resource transfer,” “business reconfiguration,” and “asset divestiture.” In an effort to make this stream of research more consistent, Karim and Capron (2016) recently provided a synthesis of those studies under the label “reconfiguration.”

Resources play an important role in driving reconfiguration in the PMI process. The idea of reconfiguration of resources is linked to the tradition of the RBV and the established notion that resources need to be altered on an ongoing basis—reconfigured—to create value (Eisenhardt and Martin 2000; Teece 2007; Helfat et al. 2007). This view offers an interesting perspective from which to study the role of resources in the M&A and specifically the PMI process—from the front-end assessment of resource complementarity between merging firms to back-end considerations of resource redeployment between them. Its scholars have investigated the nature of the redeployed resources in PMI, the direction of the redeployment (to or from the target), frictions in redeployment, and the co-occurrence of resource divestiture. This line of inquiry finds that resources are frequently redeployed between target and acquiring firms following acquisitions, notably to fill resource gaps for the receiving unit. Resources subject to contractual mechanisms (and hence market failure) such as R&D, manufacturing, and marketing resources are more likely to be redeployed (Capron et al. 1998). For acquiring firms, Karim and Mitchell (2000) find that acquisitions play a major role in business reconfiguration, enabling firms to deepen and significantly expand the scope of their current resources.

Examining patterns of resource redeployment and asset divestiture following acquisitions, Capron et al. (2001) find that post-acquisition resource redeployment leads to asset divestiture

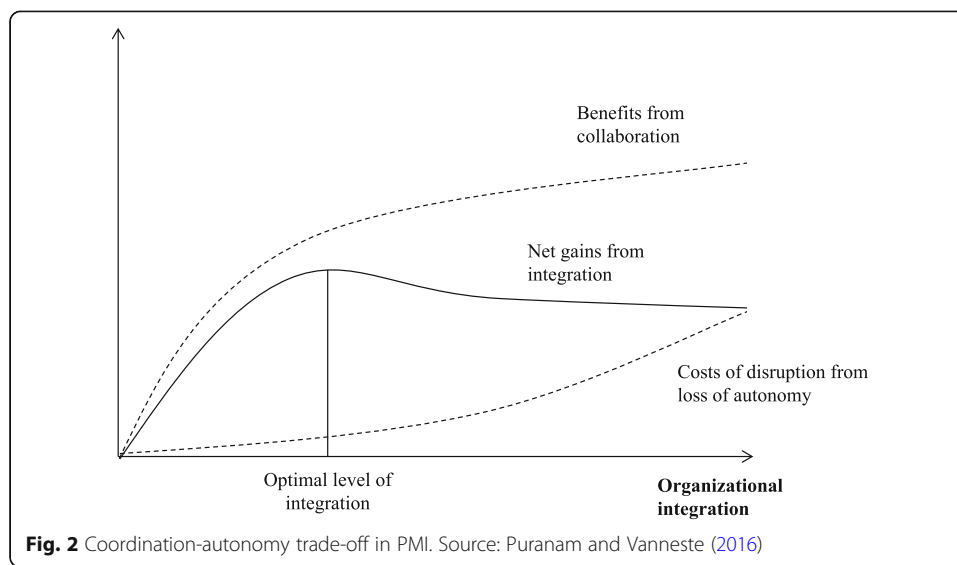
from the business that receives the redeployed resources. Since acquisitions offer an opportunity to reconfigure resources within firms, asset divestiture is a logical consequence of this. Acquisitions can also be an effective reconfiguration mechanism when complemented by internal reconfiguration (Karim 2006), acquired units being reconfigured sooner and more often than internal ones, i.e., found to be more “malleable components of the organization.” In sum, firms choose the components, business units, product lines, or resources of acquirers or targets that are to be integrated and reconfigured in the PMI process.

Merging structures: which degree of structural integration should be pursued?

In order to effectively merge their bundle of resources to reap combination benefits and change their resource base, merging firms have to define a suitable structure that involves difficult choices. The choice of organizational structure may be a challenge for an acquirer, since it needs to optimally balance the need for autonomy—often required by the target—with the need for integration to reap the economic benefits. The positive effects of integration on formal organization processes, communication channels, and group identity are referred to as coordination effects (Puranam et al. 2009). There are a plethora of ways to realize coordination effects, for instance through conversion of information systems, integration of human resource divisions, and sales integration (Zollo and Singh 2004). On the other hand, however, a high level of integration entails a loss of autonomy for the target firm, with potentially damaging effects on its innovation capabilities, people retention, and motivation. Autonomy effects can only be realized when a target is not structurally integrated. Taking into account, both the loss of autonomy effects and the gain of coordination effects, at an optimal level of integration the benefits of collaboration, are highest relative to the costs of disruption. This tension is often referred to as the “coordination-autonomy paradox” (Puranam and Vanneste 2016), as presented in Fig. 2.

Researchers have identified contingencies that impact the optimal level of integration as well as mechanisms for resolving the tension between coordination and autonomy effects after an acquisition. For instance, innovative outcomes in the context of technology acquisitions are contingent on the stage of the innovation trajectory of target firms: Integration has less of a negative impact on the innovativeness of targets that have already launched products before being acquired (Puranam et al. 2006). Common expertise and knowledge between target and acquirer prior to an acquisition offer an alternative pathway to resolve the coordination-autonomy dilemma by enabling coordination without disrupting the autonomy of the target (Puranam et al. 2009).

PMI choices that define which resources will be the target of the PMI process and which structure will be the most conducive to combine the merging firms’ resources are also influenced by the firms’ past and current M&A activities. Firms engage in PMI sequentially or concurrently for specific deals and learn from previous experience that enables them to transfer PMI knowledge across deals. Firms might be able to better nuance their PMI process and add more variety to their different integration approaches across deals. The quest for the optimal level of PMI (and thus optimal organizational structure) thus benefits from looking at multiple deals, i.e., M&A programs. Research by Barkema and Schijven (2008) found



that acquirers tended to restructure the organization after a sequence of acquisitions, allowing them to unlock more synergistic potential than when seeking a balanced integration of individual deals.

Post-merger integration: assumptions, (sub)units of analysis and observation, and key constructs

Assumptions

From the abovementioned studies, we note that the two streams we focus on rely on similar assumptions. Scholars assessing what to integrate and reconfigure and scholars assessing how to do that through making organization design choices base their studies on three *common assumptions*: (1) resource heterogeneity, (2) deliberate PMI choices, and (3) value maximizing but boundedly rational managers.

Resource heterogeneity among firms is a core assumption underlying the reconfiguration and structural integration views. It drives the nature and degree of configuration as well as the structural integration choices. By changing the bundles of resources of the merging firms, PMI in turn influences the extent of resource heterogeneity across firms.

This stream of research also assumes managerial intent, i.e., that managers make at least partially deliberate choices before reconfiguring their resource base under a new organizational structure in the wake of an acquisition. Most studies focus on managers who *choose* levels of integration and recombination in order to yield combination benefits, although the process of integration may diverge from their initial intent when merging firms face inertia, resistance, or other implementation frictions.

They further assume that managers are keen to maximize the value of an acquisition and are driven to increase both the efficiency and effectiveness of the PMI process. However, in this deliberate process, managers might have difficulties finding the optimal mix of PMI choices due to their bounded rationality, reflected in a tendency for local search, excessive use of previous templates, overreliance on routines, and limited appreciation of the M&A uniqueness. The challenges induced by bounded rationality are worsened by the presence of substantial information asymmetries that characterize the M&A process.

Units of analysis

Generally, PMI research examines antecedents or outcomes of the PMI process from three perspectives: that of the acquired entity, that of the acquiring firm, or that of the newly combined entity.

Acquired firms or business units

Structural integration is commonly assessed by looking at the target entity as the unit of analysis (Puranam et al. 2009; Puranam et al. 2006), with a focus on the preservation versus absorption of a target entity. In particular, when a target loses its visibility within the newly formed entity, structural integration can be inferred. Other studies examine how acquired firms' characteristics, such as technology life cycle, relative size, or pre-acquisition performance, impact PMI process characteristics (such as extent, speed, or nature of integration) (Karim and Mitchell 2000; Karim 2006). Others look at the effect of the PMI process on the performance of the acquired firms, such as employee retention and innovativeness (Paruchuri et al. 2006; Kapoor and Lim 2007).

To study the financial outcomes of acquired firms or business units can be a particular challenge because financial data on both pre-acquisition and post-acquisition performance measures are rarely available for acquired firms. This particularly applies to acquired units that are integrated and lose their independence and individual visibility. If a unit is integrated, it often ceases to be observable and may no longer report its performance separately from the new parent. Given the difficulty of observing business units and acquired firms of all levels of integration, research is often limited to non-financial outcomes. Studies that do include acquired firms' or business units' performance outcomes have assessed these measures through survey responses (Capron et al. 1998; Zollo and Singh 2004).

Acquiring firms and newly combined entities

PMI studies examine how acquiring firms' characteristics such as relative size, pre-acquisition performance, and structure (centralized vs. decentralized) impact the PMI process (Pablo 1994; Bauer and Matzler 2014). Other studies look at the effect that PMI process characteristics, such as its speed or degree, have on the performance of the acquiring firm (Ahuja and Katila 2001; Barkema and Schijven 2008) or the newly combined entity (Capron 1999; Homburg and Bucerius 2006; Heimeriks et al. 2012). Among studies on the impact of PMI on merging—both acquired and acquiring—firms' performance, a key challenge is to define and observe a counterfactual. Which firms should be compared when looking at the outcome of PMI? One interesting example can be found in Kapoor and Lim's (2007) study, where the authors compare the innovative productivity of inventors from acquired firms to that of non-acquired firms and find that inventors in acquired firms are less innovative (Kapoor and Lim 2007).

Sub-units of analysis

As is apparent from the abovementioned PMI studies, scholars often unpack the entity-level unit of analysis (acquired, acquiring, and combined firm) to study more fine-grained aspects of the PMI process (that we refer to as "sub-units of analysis"), such as resources, product lines, business units, top management teams, and systems.

Resources

In the PMI process, merging firms are reconfigured when their resources are added to, redeployed within, or divested from the new entity formed by acquirer and target firm. Firms have multiple kinds of resources in different areas, including R&D, marketing, finance, management, logistics, and human capital. They need to modify these resources and their underlying routines to adapt to the environment. To understand how they do so, researchers track resource allocation during integration between acquirer and target. The use of surveys has been helpful in providing such insights. Capron et al. (1998) investigated the redeployment of resources in the PMI process, i.e., the modified use of resources after an acquisition, and assessed the extent to which the targets' resources were applied in the acquirers' businesses and vice versa. Capron et al. (2001) not only looked at resource redeployment but also at resource divestment, which could entail the closure of physical facilities as well as cuts to the workforce in various areas as a consequence of M&A.

Lines of products

Another unit of analysis for the purpose of studying reconfiguration is the product line. Karim and Mitchell (2000) view changes to product lines as a form of resource reconfiguration and assess these changes over time. Data on the US medical sector allow them to assess how acquirers and target businesses add and keep product lines and to compare reconfiguration patterns of product lines between acquiring and non-acquiring firms. Overlaps in product lines between acquirer and target are referred to as "resource deepening," while new product lines added to the combined entity are referred to as "resource extensions." Krishnan et al. (2004) use similar data on product line changes in US hospitals.

Business units

Some PMI studies focus on business units as the subjects of integration. For instance, Barkema and Schijven (2008) suggest that integration decisions at the business unit level are initially suboptimal and that businesses are only holistically integrated at a later point. A challenge when looking at the reconfiguration of business units is the availability of data because evidence of how business units within a firm are modified over time is rarely observable. Barkema and Schijven (2008) collected data from annual reports of large Dutch firms. Karim (2006) chose a context that would allow insight into business units—the US medical sector. Observing the business units through detailed analysis of reports, she also tackled the challenge of finding a counterfactual, comparing the modifications of acquired business units to those of internally developed business units.

Target top management teams

Some researchers have argued that the retention of key employees makes it easier for firms to maintain access and benefit from an acquired firm's technologies and capabilities (Ranft and Lord 2002), particularly if the knowledge within the acquired firm is tacit or socially complex. Attrition among key employees has been mentioned in prior research as one mechanism by which a high degree of integration can negatively affect outcomes of M&A (Puranam et al. 2009). Other research analyzes the replacement of key employees such as the top management team as an explanatory variable of acquisition performance (Zollo and Singh 2004).

Systems

Integration from a structural perspective also entails linking equivalent functions of target and acquirer after they form the new entity by aligning or centralizing existing systems. Researchers focusing on systems as their unit of analysis face issues of collecting data, since systems and processes within firms are difficult to observe. Zollo and Singh (2004) assessed via surveys the perceived alignment and centralization of systems, procedures, and products in their sample of US banks. Cording et al. (2008) also used a survey-based approach to account for the alignment of multiple activities between the merging firms, such as human resources, production, marketing, and management systems.

Key constructs

Studies of PMI base their analysis on constructs of reconfiguration, structural integration, the characteristics of the transaction, the relation between acquirer and target, and outcomes.

Reconfiguration

Reconfiguration captures the extent to which assets, resources, business units, or business lines are added, recombined, redeployed, and divested (Capron 1999). Researchers often track these modifications at multiple levels through survey questions posed to key employees or executives involved in an acquisition. Others monitor the recombination of units of interest by coding reports that hold information about products or business lines of targets and acquirers. For instance, Karim and Mitchell (2000) observed changes of business lines and Karim (2006) followed acquired and internally developed business modules.

Structural integration

Structural integration is often conceptualized as a binary construct contrasting, for instance, organizationally distinct vs. non-distinct (Puranam et al. 2009) or aligned vs. non-aligned functions, such as R&D activities (Paruchuri et al. 2006). This type of information can be retrievable from annual reports or press releases. Survey scales have also been used to capture structural integration. For example, Zollo and Singh (2004) used a survey-based approach to assess the extent to which systems, procedures, and products were aligned or centralized after an acquisition. Similarly, Bauer and Matzler (2014) used surveys to measure sociocultural integration, integration of production, marketing integration, and systems integration in their study.

Characteristics of transaction or acquirer-target relation

The characteristics of a deal and the relation of the acquirer-target dyad play an important role in research on PMI. The literature often focuses on deals that are characterized as knowledge- or technology-intensive compared with those that are not. With regards to the acquirer-target relation, analyses often include a measure of relatedness between target and acquirer using SIC codes or resource-similarity measures through surveys (Capron 1999). The dyad of target and acquirer can be further characterized by their “interdependence,” referring to the notion that the value generated by the acquirer when performing a certain activity depends on activity performed within the target. Puranam et al. (2009) conceptualize interdependence by comparing targets producing component technology to those that produce standalone products.

Outcomes of PMI

The consequences of integration choices are often the focus of PMI studies, notably in two respects—in financial terms and in terms of innovation. Financial outcomes can be measured either as return on assets (ROA), considering changes before and after an acquisition (Barkema and Schijven 2008; Zollo and Singh 2004), as stock returns for public acquirers through event studies (Capron and Pistre 2002), or changes in productivity (Bertrand and Capron 2015). When data is unavailable or hard to obtain—which is often the case for data on targets—estimations of financial performance can be assessed through surveys (Capron 1999). Innovation outcomes can be measured as the count of new products, which may be available from annual reports (Puranam et al. 2006), or as the number of patents secured (Ahuja and Katila 2001; Kapoor and Lim 2007).

Design of empirical research on PMI

In this section, we formulate simple guidelines to approach, design, and implement empirical work on questions on PMI, keeping our focus on reconfiguration and organization design perspectives.

Research questions

As mentioned previously, the existing literature on PMI generally seeks to answer one of the following questions: Which resources or units do merging firms reconfigure post-acquisition? What level of structural integration do merging firms pursue post-acquisition? And what is the outcome of the PMI activities? Interesting new research questions could particularly stem from integrating the fragmented fields of research on PMI. In practice, resource reconfiguration and structural integration choices in the PMI process go hand in hand. We dedicate this section to take a first step in this direction by assessing opportunities of research that are at the intersection of reconfiguration view and organization design research.

A first approach to generate new research questions is to add a temporal dimension to the resource reconfiguration and structural aspects of PMI choices by examining sequences and patterns of integration activity. Karim (2006), for example, analyzes which units (acquired or internally developed ones) are reconfigured more often and more quickly. What are other drivers of speed and of the frequency of integration choices? Under what circumstances do structural organizational choices foster swift reconfiguration? Capturing whether and when the effects of the PMI process vary over time is one possibility. Does the autonomy effect that results in demotivation and disruption of routines when integration levels are high fade over time? Can gains from coordination increase over time? Do firms go through cycles of intense integration followed by “hoarding” periods when there is a scarcity of integration skills?

A second approach that can be particularly fruitful is to look at multiple modes of reconfiguration and organization design choices in combination. Comparing reconfiguration activities across different reconfiguration modes and assessing their similarities could hold interesting new avenues for research: Across multiple modes, such as alliance deals and acquisitions, firms seem to garner similar learning in the integration process (Bingham et al. 2015). How does engagement in multiple modes of corporate growth affect PMI choices and outcomes? For instance, we can imagine that firms that engage

in alliances make different integration choices, potentially needing different access to resources in the target. Could integration choices and alliances or joint ventures compete or complement each other? How does the combination of these engagements affect the PMI outcomes?

Research opportunities can also stem from exploring boundary conditions and moderators to basic existing patterns by combining logics of reconfiguration and organization design aspects. Puranam et al. (2009) looked for boundary conditions to, and an alternative pathway around, the coordination-autonomy dilemma. Other moderators such as type of acquirer (financial vs. strategic) or governance of acquirer (listed vs. private firm) may impact how the coordination-autonomy dilemma is managed in the PMI process. Which units do certain firms choose to integrate, and under which organizational structures? How does their motivation for acquiring influence the optimal combination of integration choices?

A matter of particular interest is the effect of internal structure: How does the coordination-autonomy dilemma play out across different types of corporate structural settings? Arora et al. (2014) find that the organization design of firms (centralized vs. decentralized) affects the integration of knowledge. Centralized structures integrate more internal knowledge, while decentralized structures rather integrate external knowledge. Thus, not only does PMI drive structural choices but structural choices also influence M&A and integration choices. This link between the structure of acquiring firms and the integration choices holds another interesting research trajectory. How do ex-ante structures of acquirers affect target selection and their subsequent integration processes?

A fourth avenue is to further explore PMI as a reactive process to external and internal tensions. For instance, researchers could assess PMI in the context of differing external turbulence through institutional or competitive environments. What PMI choices do firms make in more turbulent environments? How does the environment of the target affect the integration process and with which outcomes? Similarly, there may be an interplay between PMI and firms' internal turbulence. An aggressive M&A program can generate internal turbulence, creating a need for more subsequent restructuring. Barkema and Schijven (2008) outlined the partial, suboptimal integration of acquired business units and the M&A threshold that triggers substantial restructuring of a set of acquisitions. When do restructuring activities within M&A programs take place and what triggers them? How does the coordination-autonomy paradox evolve through the deployment of M&A programs?

Setting and operationalization

Once a research question has been defined, it is necessary to identify an empirical setting in which it can be tested. Researchers tend to choose settings in which M&A is a fairly frequent strategic action of firms. For instance, Zollo and Singh (2004) chose the US banking industry in a phase of consolidation precisely because of the increased number of observations. In these various settings, researchers have used different methods to gather private data on integration, often complemented with data from publicly available sources.

Because of its complexity and the often fine-grained nature of its data, PMI research can benefit from qualitative inductive work. For instance, Bresman et al. (1999) used

the special insights that qualitative work offers to investigate the transfer of knowledge in PMI processes. Specifically, the researchers gained insight into the temporality and directionality of knowledge transfer: While the acquiring firms transferred more knowledge to targets immediately after M&A, transfer would become bidirectional later on. Ranft and Lord (2002) explore in-depth case studies to develop a grounded model of PMI. In their work, they suggest that characteristics of knowledge-based resources acquired in M&A affect acquirers' ability to transfer these resources to their own business. They specifically note the importance of tacit and socially complex knowledge resources as critical in the PMI process—distinctions that are important in practice but difficult to assess in larger scale PMI studies. Further, inductive work on simulation could significantly contribute to the PMI field and could instigate the interest in PMI program research.

With its complex object of analysis, PMI research can also deepen the understanding of distinct aspects of the process by resorting to experiments. For instance, Weber and Camerer (2003) performed a laboratory experiment where they grouped their participants in order to simulate cooperation in firms. In a second step, participants of two separate groups were told to work together as a merged unit. The new unit being less efficient, members maintained an overestimated perception of their performance and attributed decreases to other units. In this type of setting, researchers could simulate similar key aspects of PMI processes.

The use of surveys can also be an effective way of accessing fine-grained data on a larger scale, such as those on resource redeployment, the mobility of people, and the nature of tensions in the PMI process (Capron 1999; Cording et al. 2008; Bauer and Matzler 2014). For instance, Capron (1999) used a survey to investigate the extent of resources being redeployed between acquirer and target. Zollo and Singh (2004) used a survey-based approach to explore the link between codified and tacit knowledge from experience and financial performance in the US banking industry. Questionnaires can also be used in combination with other coded or hand-collected data. Zollo and Singh (2004) assessed the extent of PMI through a survey and measured knowledge codification, an additional explanatory variable, as the count of manuals and guidelines within the firm.

Researchers have also found settings in which they can observe and hand collect data on PMI (e.g., Karim and Mitchell 2000; Krishnan et al. 2004). Karim (2006), for example, found a suitable setting in the medical sector where reports gave information about which product lines each firm pursues. Barkema and Schijven (2008) coded restructuring efforts from the annual reports of Dutch multinationals to study the unlocking of synergies through PMI.

As for secondary databases, we outline some data sources below that enable researchers to collect information on deal characteristics, acquirer-target relations, outcomes, and integration. Electronic databases contain useful information on deals, acquirers, and targets. The deals themselves can be identified in SDC Platinum, and information on the involved firms is often available in COMPUSTAT. In these databases, researchers have the opportunity to select companies belonging only to certain industries based on SIC codes. PMI research has in the past focused on the pharmaceutical industry (Paruchuri et al. 2006; Schweizer 2005), communication and information technology (Graebner 2004; Puranam et al. 2006), the health care industry (Karim 2006), the manufacturing industry (Capron 1999), and the banking industry (Zollo and Singh 2004). Holding the industry constant

may allow a sample to be identified that faces relatively similar environmental conditions. Technology firms are often used as the setting when interested in knowledge outputs and exchange in M&A as they produce patents.

Data on innovation outcomes can stem from multiple sources. For instance, product launches can be observed through press releases which can be found in databases such as Lexis-Nexis (e.g., Paruchuri et al. 2006). Patent data has also been used to look at common patent activity between targets and acquirers, available through the US Patent and Trademark Office (USPTO). For technology acquisitions, partial information on integration is accessible through CORPTECH, which holds profiles and descriptions of technology firms. As a proxy, researchers have inferred structural integration from the visibility of a target after an acquisition in this database (e.g., Puranam et al. 2006).

Estimation

From this brief review, we can conclude that studies on PMI focus on integration as either an independent or dependent variable. The typical questions ask if and when integration or reconfiguration occurs, with what outcome, and at what speed. The estimation approaches for both efforts of interest are presented below. We point in particular to estimation techniques that include temporal factors for PMI both as dependent and explanatory variables.

- (1) $PMI_{it} = \alpha + \beta \times Antecedents_{it} + \theta \times Controls + \varepsilon_{it}$
- (2) $Outcome_{it} = \alpha + \beta \times Integration_{it} + \theta \times Controls + \varepsilon_{it}$

Estimating propensity or level of integration (1)

As mentioned above, integration can be either viewed as a binary variable or on an interval scale assessed through surveys. The model depicts possible effects of antecedents to PMI of an entity i (e.g., an acquiring or an acquired entity) at a time t (usually, the year), where ε_{it} is the unobserved error term. PMI of an analyzed entity i can be operationalized as a dichotomous variable. In this case, the model requires conditional logistic regression strategies to be estimated (e.g., Puranam et al. 2009).

Other researchers assess PMI on interval scales as the magnitude of redeployment (e.g., Capron et al. 2001). In such cases, structural equation models and standard linear estimation models are adequate. When the independent variables are dichotomous—for instance, when comparing acquired to non-acquired business units—a t test to compare differences of integration levels between groups is used (e.g., Karim 2006).

Outcomes of integration (2)

In many studies on PMI, the decision to integrate represents the key independent variable. Financial outcomes are usually estimated through standard linear models. For instance, Zollo and Singh (2004) estimate the change in ROA of firms using ordinary least squared (OLS) regression.

When studying PMI choices and PMI outcomes as the dependent variable, it is important to be aware of and to address issues of endogeneity—issues of correlations between any unobserved variables and the error term of the dependent variables (PMI choice or PMI outcome) of our models.

One issue of endogeneity can stem from disregarding heterogeneity among the observations of interest. Solutions for this issue are to include variables that can account for this heterogeneity as controls or to include fixed effects. This way, variance that is not due to the explanatory variable of interest can be absorbed. Therefore, when studying PMI likelihood and extent, researchers should include any variables that would affect the integration decision and are not the scope of their analysis as control variables. Models to estimate PMI outcomes also benefit from the use of relevant control variables. Such control variables include characteristics of acquirers or targets (such as size, age, profitability, R&D investments, ownership structure, and quality) or their relatedness. Any variance that stems from time-invariant differences among the units of analysis can be absorbed, i.e., controlled for, by the usage of firm fixed effects. In studies of PMI outcomes and the likelihood of integration or reconfiguration for a unit i (an acquiring or an acquired entity), researchers therefore often use panel data, which enables the use of firm fixed effects to control for unobservable characteristics of the units of analyses that do not change over time. Researchers may also include year or industry fixed effects to absorb any other variance in their outcomes that is due to unobserved characteristics which are time- or industry-specific and not the focus of their study.

Self-selection into the treatment is also an issue of endogeneity and somewhat trickier to handle. This is particularly true in research on firms' strategic choices and their outcomes, such as the PMI choice, where the decision is the treatment of interest. PMI decisions are evidently not made at random. In the link between PMI choice and its outcome, effects that might be related to the choice of integration might themselves be associated with the assessed outcome. This issue is critical since it hinders the researchers from retaining accurate estimations of the link between the decision and its outcome and cannot be solved by merely adding control variables.

A possible way to account for selection biases is to generate balanced samples in which we try to compare treated units to appropriate control groups. A method that is increasingly used for this purpose is matching models. In these models, the researcher considers observable characteristics that would affect a firm or unit to be treated in the first place. On the example of PMI choice and its outcome, the researcher could separate the link of interest into two stages, the first stage being represented by model (1) in the above, to assess the propensity to be treated based on some observed characteristics. In a second stage (model (2)), the outcome of PMI would be regressed onto the PMI choice, considering the selection bias at the first stage. Both coarsened matching and propensity score matching are ways for researchers to make sure their control and treatment group are comparable. Because the PMI choices are subject to selection bias, controlling for aspects that lead to these choices and the careful application of matching models holds potential for successfully pinning down effects of PMI on firm-level outcomes.

$$(3) \text{PMI-hazard-rate}_i(t) = h(t) \times \exp(\beta \times \text{Antecedents}_i + \theta \times \text{Controls})$$

$$(4) \text{Outcome-hazard-rate}_i(t) = h(t) \times \exp(\beta \times \text{Integration}_i + \theta \times \text{Controls})$$

Estimating timing of integration or outcomes—(3) and (4)

As mentioned earlier, the timing of integration and its outcomes increasingly attract researchers' interest. To estimate the probability of a unit being reconfigured or integrated at time t , or to estimate when outcomes occur after integration, methods of

event history analysis can be applied. The hazard rate in these studies can represent either the integration or reconfiguration of a unit in a firm (simplified specification in (3)), or the outcome of integration (simplified specification in (4)). Both these dependent variables, the duration until PMI or outcomes of PMI, can be specified as explained by time and a set of covariates and parameters.

We distinguish between continuous and discrete time models. In the case of PMI outcomes or choices, the events of interest can most likely occur at any point in a time continuum. While PMI data will usually be restricted to a more discrete form, whereby time is grouped into specific intervals, the choice between discrete and continuous time models can be guided by the underlying phenomenon. Thus, although PMI choices and outcomes might be observed in discrete intervals, PMI research often makes use of continuous time models that do not rely on specific assumptions about underlying hazard functions. For instance, Puranam et al. (2006) use a proportional hazard rate model to assess the hazard of a new product introduction, where integration is one of the covariates of interest. Proportional hazard rate models do not place restrictive assumptions on the probability distribution of the hazard (Puranam et al. 2006). In their study the authors include a base rate of changing states that is the same across all target firms, which is multiplied by the effect of covariates.

As outlined above, studies focusing on PMI outcomes have to address the issue of non-random choice to integrate. Accelerated event time models can address this issue when performing event history analysis. Karim (2006) applied an accelerated event time model to examine at what time reconfiguration or divestment would occur for acquired business units. This type of model requires the assumption of a certain error distribution, which can be challenging. A proportional hazard rate model does not require this type of assumption and leaves time dependency of $h(t)$ in the above formulas (3) and (4) unspecified.

Implications for organization design

It goes without saying that PMI choices greatly affect organization design, since the merged firm will have to create new capacities for processing information and managing task interdependence across merging businesses. The problem of PMI is essentially an organization design problem, with complex grouping and linking activities to design and manage (Puranam and Vanneste 2016). Without the right organization design, the PMI process will likely derail and hinder acquisition performance.

Merging firms often negotiate hard to find the right organization design, i.e., one that reaps combination benefits from the merger. It is thus essential for firms to understand gains and costs of their integration choices in the specific context of the acquisition. Merging firms, both acquirer and target, need to find internal alignment on the motivation behind an acquisition, such as leveraging knowledge or capabilities, and choose the level of integration accordingly (Puranam and Srikanth 2007), before defining the degree of structural integration.

In addition to choosing the right level of structural integration, firms also choose the object of the integration effort, i.e., which units to alter or reconfigure, and which resources. Some studies offer finer granularity on the issue of PMI and give some insight

into the selection of units that are changed in the process of PMI, and how they are changed. Karim's (2006) findings, for instance, suggest a difference in how target and acquirer units contribute to organization design. The choice to divest, redeploy, or recombine resources (e.g., Capron 1999), units (e.g., Karim 2009), or production lines (e.g., Krishnan et al. 2004) is fundamentally a choice of organization design.

To further unpack the PMI decision, merging firms have to make two organizational choices: groupings (units, departments) and linking across groupings (vertical reporting, dedicated liaisons, temporary task forces) (Puranam and Vanneste 2016). The grouping and coupling choices are likely to be complementary. The more firms move towards full absorption, the higher the grouping and linking activities across merging firms. On the independence-absorption continuum, one should observe a broad set of configurations of linking-grouping activities. Furthermore, the choice of geographic or physical location can reinforce or weaken the benefits of integration choices.

Organization design should also be tied to the creation and management of the tension between high and low structural integration. As Puranam et al. (2009) found, the generation of common ground—shared knowledge between acquirer and target prior to the acquisition—increases coordination in such a way that higher levels of integration (and their costs) are unnecessary. This finding offers a way for firms to generate processes and capabilities to identify and increase shared knowledge, potentially without absorbing a target firm.

One organization design issue of PMI regards the organizational structure of a firm. Several studies have outlined the notion of modularity as a key enabler of the PMI process. Modular structures facilitate the post-merger reconfiguration of resources and businesses, enabling merging firms to deepen and extend their resource base (Karim and Mitchell 2000), and to reap inter-temporal economies of scope as they redeploy resources between units over time (Helfat and Eisenhardt 2004). In a modular structure, acquired units take on different functions than internally developed units and, as Karim (2006) finds, acquired units are more often reconfigured than internally grown ones, and can function as a source of value to the acquiring firms.

A final aspect of organization design in the PMI process pertains to the development of an acquisition capability through the accumulation, coordination, and redeployment of knowledge on PMI itself. Zollo and Singh (2004) found that while the mere accumulation of knowledge did not have beneficial outcomes, the existence of a knowledge stock did, in particular at higher levels of integration. Knowledge stock refers to documents, guidelines and manuals dedicated to helping the acquisition and PMI process. Organizational mechanisms such as centralized knowledge functions and M&A functions enable firms to accumulate, codify, retrieve, update and redeploy PMI accumulated knowledge on new M&A deals, building over time a distinctive hard-to-replicate M&A capability.

Future research directions

In the strategy literature on M&A, many questions around the balancing efforts of PMI remain unanswered. We present some possibilities for future research to extend knowledge of PMI, in particular from the perspectives of the reconfiguration view and structural organization design choices.

While previous studies have outlined the processes of reconfiguration as a source of capability creation or focused on structural integration, combining structural integration and reconfiguration is a fruitful avenue of research. Karim (2006), who links the structural design of modularity to the opportunities to reconfigure internally developed and acquired business units, is a notable example. One topic that would benefit from combining both perspectives is alternative paths to the “coordination-autonomy” dilemma. Researchers could further our understanding of whether reconfigurations of selected resources may help solve this dilemma. For instance, it is possible that the integration of certain kinds of resources is more detrimental to the autonomy effects of a target than it is beneficial with respect to coordination effects. Likewise, the anticipated inability to solve the coordination-autonomy dilemma may lead a firm to self-select into certain types of resource reconfiguration.

Temporal perspectives to the issue of PMI also offer promising research directions for both the structural and reconfiguration view. Barkema and Schijven (2008) argue that PMI as a process can span multiple acquisitions over time. The initial integration effort of each deal in and of itself is inevitably suboptimal. However, after a set of acquisitions, firms tend to restructure and make an effort to better integrate subsequent acquisitions. They may experience disruption due to a misfit of previous integration choices, and active acquisition programs can help resolve such internal turbulence.

Researchers in the realm of M&A have also increasingly shown interest in its more fine-grained, micro-foundational aspects (e.g., Nadolska and Barkema 2014). However, we know little about how managers’ human capital affects post-merger reconfiguration and structural integration choices and their outcomes. Some research has instigated interest into how PMI affects individuals within the firm. For instance, Briscoe and Tsai (2011) qualitatively analyzed the change of social ties after M&A. In addition, research has investigated employee attrition as linked to PMI (Puranam et al. 2009). Other reconfigurations of managerial human capital under a new organizational structure could be interesting aspects of the PMI process—for instance, how managerial capabilities might be transferred or shared between target and acquirers. Drivers and outcomes at a micro-level could thus hold interesting insights for PMI research.

While research has studied how internal disruption can be managed through integration programs, it could be interesting to assess the impact of external factors such as the institutional environment or sudden external shifts in technology or regulation on the PMI process. Capron and Guillén (2009) found that strong shareholder rights enabled, while labor rights impeded, the acquirer to make post-merger changes, with a firm’s M&A experience moderating this relationship. One could speculate, for instance, that very disruptive environments may be conducive to more modular approaches that would favor preservation—to remain more flexible and to be able to divest when necessary. Researchers could be interested in the process of *dis*-integration after divestiture.² Scholars could thoroughly assess the reconfiguration of resources between a divested unit and its parent firm, which may have shared resources prior to divestment. Units that are more integrated through processes of PMI would require different processes of divestment than businesses that were not integrated in the first place.

Scholars have increasingly come to recognize that firms cannot usefully contemplate a particular mode of reconfiguration in isolation. Instead, firms must make integrated

reconfiguration decisions about augmenting or deleting resources and businesses (Capron and Mitchell 2009; Rothaermel and Alexandre 2009). Patterns of reconfiguration and how organization design enables them hold interesting insights: One example is the work by Bennet and Feldman (2017), who identify patterns of divestitures and follow-on acquisitions. They find that firms engage in acquisition at an increased rate after they divest units through spin-offs. It is plausible that this pattern indicates the attempt to free up managerial capacity to be redeployed internally.

PMI research would benefit from examining the interplay of M&A with other modes of corporate scope changes, such as internal development, joint ventures, alliances, licensing activities (Capron and Mitchell 2012), or divestiture programs (Feldman and McGrath 2016). Assessment of this interplay would provide opportunities to examine learning spillovers across modes, their complementarity and conflicting aspects, their respective sequence and the capability and governance skill building process, providing further avenues of enquiry in the years to come.

Conclusions

The study of M&A and the complex process of PMI remain an area with many unanswered questions. As a contribution to the existing but fragmented research on this topic, it seems particularly promising to investigate complementarities between organization design and resource reconfiguration perspectives on PMI. The objective of this paper has been to offer an overview on the existing research in these two literature streams and their core elements, and to outline remaining open questions on the topic of PMI. The interaction between organization design choices and resource reconfiguration efforts might not only be critical in the context of M&A, but also across various other modes of corporate scope changes, providing further avenues of enquiry in the years to come.

Endnotes

¹For a review, see Seth 1990.

²See Feldman and McGrath (2016) for a primer on divestitures.

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