

Northumbria Research Link

Citation: Christofi, Michael, Vrontis, Demetris, Thrassou, Alkis and Shams, Riad (2019) Triggering technological innovation through cross-border mergers and acquisitions: A micro-foundational perspective. *Technological Forecasting and Social Change*, 146. pp. 148-166. ISSN 0040-1625

Published by: Elsevier

URL: <https://doi.org/10.1016/j.techfore.2019.05.026>
<<https://doi.org/10.1016/j.techfore.2019.05.026>>

This version was downloaded from Northumbria Research Link:
<http://nrl.northumbria.ac.uk/id/eprint/40273/>

Northumbria University has developed Northumbria Research Link (NRL) to enable users to access the University's research output. Copyright © and moral rights for items on NRL are retained by the individual author(s) and/or other copyright owners. Single copies of full items can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided the authors, title and full bibliographic details are given, as well as a hyperlink and/or URL to the original metadata page. The content must not be changed in any way. Full items must not be sold commercially in any format or medium without formal permission of the copyright holder. The full policy is available online: <http://nrl.northumbria.ac.uk/policies.html>

This document may differ from the final, published version of the research and has been made available online in accordance with publisher policies. To read and/or cite from the published version of the research, please visit the publisher's website (a subscription may be required.)

**Triggering technological innovation through cross-border mergers and acquisitions: a
micro-foundational perspective**

Authors details

Michael Christofi*
University of Nicosia
46 Makedonitissas Avenue, CY-2417
P.O.Box 24005, CY-1700, Nicosia, Cyprus
Tel.: +357 22842054
E-mail: christofi.mi@unic.ac.cy
*Corresponding author

Demetris Vrontis
University of Nicosia
46 Makedonitissas Avenue, CY-2417
P.O.Box 24005, CY-1700, Nicosia, Cyprus
Tel.: +357 22842026, f: + 357 22842050
E-mail: vrontis.d@unic.ac.cy

Alkis Thrassou
University of Nicosia
46 Makedonitissas Avenue, CY-2417
P.O.Box 24005, CY-1700, Nicosia, Cyprus
Tel.: +357 22841716
E-mail: thrassou.a@unic.ac.cy

S. M. Riad Shams
Ural Federal University
Yekaterinburg, Russia
E-mail: Riad.Shams@urfu.ru
Postal address:
kv. 1317
d. 70, ul. Komsomolskaya
Ekaterinburg 620018, Russia

Abstract

Over the past 30 plus years, the development of technological innovation through cross-border mergers and acquisitions (M&As) has captured an increasing amount of attention in business research and practice. The emerging literature on the topic addresses a significant phenomenon, however, it lacks theoretical underpinning and a cumulative empirical inquiry, from a micro-

foundational perspective. Hence, a systematic and integrative research effort seems justified. Accordingly, we systematically review and analyze 30 articles published in 16 top-tier peer-reviewed journals from 1985 to 2018. We provide the first comprehensive systematic review of extant literature, include a critical analysis of these research efforts, identify several methodological, contextual and theoretical issues and problems that need to be addressed and offer avenues for future research. The paper concludes with an integrative framework that provides the basis for both theory and practice to further build on and be guided by.

Keywords

Technological innovation, cross-border mergers and acquisitions, micro-foundations, systematic review, integrative framework.

Highlights

- A literature review on the link between technological innovation and cross-border mergers and acquisitions
- Systematic methodology adopted covering the period 1985 to 2018
- Provided a descriptive and thematic analysis of the findings
- Synthesized the literature findings according to a theme-based logic
- Developed an integrative framework of extant literature

Triggering technological innovation through cross-border mergers and acquisitions: a micro-foundational perspective

Abstract

Over the past 30 plus years, the development of technological innovation through cross-border mergers and acquisitions (M&As) has captured an increasing amount of attention in business research and practice. The emerging literature on the topic addresses a significant phenomenon, however, it lacks theoretical underpinning and a cumulative empirical inquiry, from a micro-foundational perspective. Hence, a systematic and integrative research effort seems justified. Accordingly, we systematically review and analyze 30 articles published in 16 top-tier peer-reviewed journals from 1985 to 2018. We provide the first comprehensive systematic review of extant literature, include a critical analysis of these research efforts, identify several methodological, contextual and theoretical issues and problems that need to be addressed and offer avenues for future research. The paper concludes with an integrative framework that provides the basis for both theory and practice to further build on and be guided by.

Keywords

Technological innovation, cross-border mergers and acquisitions, micro-foundations, systematic review, integrative framework.

Introduction

In today's hypercompetitive and contemporary business environment, businesses across the globe increasingly seek value for their operations via concepts and channels that embrace what really matters to their customers (Christofi et al. 2018; Ferraris et al. 2018; Campanella et al. 2016). Corporate investment in both domestic and cross-border mergers and acquisitions (hereafter referred to as M&As) lies in the heart of this philosophy and in the last decade has reached unprecedented levels on a global scale (Bresciani et al. 2018; Shin et al. 2017; Christofi et al. 2017; Haleblan et al. 2009). In particular, cross-border M&As have become increasingly significant, capturing, in terms of deal value, approximately 40% of all M&A activities (Humphery-Jenner et al. 2017). Such global strategic partnerships have increasingly become one of the most significant international strategies for organizations to enhance their performance (Zhu et al. 2019; Ferraris et al. 2017; ; Hagedoorn and Duysters, 2002).

However, there is considerable evidence that many acquirers fail to gain value from cross-border M&As (Zhu et al. 2019; Huang et al. 2016). Adding to this, various studies argued that strategic and financial variables are non-significant in explaining post-M&A performance and that researchers should focus on other factors (Rozen-Bakher, 2018; Christofi et al. 2017; Weber et al. 2011). To this end, scholars from various disciplines have since endeavored to investigate and provide explanations of post-acquisition performance of cross-border M&As. Thus, linking this research exposure along with its practical significance, cross-border M&A activity has increasingly become a focus of research in various academic disciplines (Graebner et al. 2017; Haleblan et al. 2009). However, even though this research interest has created a significant amount of M&A-related knowledge, the various findings from these distinct disciplines lacks theoretical

integration and its characterized by fragmentation, which limits researchers' abilities to synthesize notable contributions from each discipline (Graebner et al. 2017; Haleblian et al. 2009).

Furthermore, businesses often pursue global strategic partnerships for enhancing their technological capabilities (Alsaad et al. 2018), such as M&As to tap the innovative potential of young, entrepreneurial organizations, which are an increasingly significant source of new technical knowledge and spurs technological innovation (Karagouni, 2018; Graebner et al. 2010). Although several studies have investigated the various factors and dimensions and circumstances for the structural integration of such strategic partnerships at the firm (macro) level of analysis, there is a need to comprehend better the implementation at the group as well as the individual (micro) levels of analysis (Graebner et al. 2010). Adding to this, several researchers have pointed the fragmented nature of extant research on technological innovation and social change spurred by global strategic partnerships, such as cross-border M&As, and the need to deepen its theoretical and test its empirical underpinnings (Graebner et al. 2017; Scuotto et al. 2017). Moreover, based on these observations as well as the importance of cross-border mergers and acquisitions for triggering technological innovation, we recognize the need for a comprehensive and up-to-date assessment of the extant literature and, relatedly, the degree to which this body of research appropriately reflects the necessary information needed, the key issues and challenges faced by businesses in today's era in applying such an innovation capturing strategy.

Furthermore, given the practical and theoretical significance of cross-border M&As in spurring technological innovation and its impact on organizational performance, it is surprising that there are no comprehensive reviews on the topic published in the past three decades. As a result, the domain lacks from a systematic discussion of how these multi-disciplinary findings relate to each other, leaving an unclear understanding of the topic, punctuated by critical gaps. In particular, a

systematic review is important and necessary as it facilitates theory development, closes off areas of inquiry where a vast amount of research exists, and reveals fruitful research paths for new streams where research is needed (Nielsen et al. 2017; Webster & Watson, 2002). We identified only one systematic review paper that discussed the link between M&As and innovation (Dezi et al., 2018) but in a much differing way, which fairly constitutes a very different systematic review than the one we provide here. More specifically, the differences between our systematic review and that of Dezi et al. (2018) are the following. First, in contrast to Dezi et al.'s (2018) review, we focus on cross-border mergers and acquisitions (compared to mergers and acquisitions in general) as well as on the micro-foundational perspective of the link between technological innovation and cross-border M&As (Dezi et al.'s study makes no such distinctions). Thus, Dezi et al.s (2018) review enhanced the knowledge of the link between innovation and mergers and acquisitions but did not distinguish between micro and macro levels of analysis, as well as between domestic and cross-border mergers and acquisitions. Second, another difference and contribution at the same time, stems from the fact that our systematic review provides a much more up-to-date and comprehensive insight into the 'state of the art' than the systematic review conducted by Dezi et al. (2018) in this topic, as we have covered a period of 33 years, compared to approximately 6 years that Dezi et al.'s (2018) review covers (from 2012 to June 2017). Third, in our analysis, contrary to Dezi et al.'s (2018) systematic review, we embraced a theme-based logic for the synthesis part, that allowed us to proceed systematically in the content analysis of the selected studies and identify 8 broad themes that we have used to provide a summary of the key results obtained in extant research. By doing so, in this paper, we also developed an integrative framework that allows us to organize and analyze the existing body of literature in a systematic way, as well as to be used as a tool for researchers to further develop and practitioners to be guided by. In

contrast, Dezi et al.s (2018) review provide no such framework. Thus, to our knowledge, this is the first study that attempts such a comprehensive descriptive and thematic overview of extant literature, as well as the synthesis of the findings in an integrative framework.

In this paper, we aim on addressing these gaps and realities by reviewing and critically analyzing the existing literature on value capturing and value creating factors of technological innovation through cross-border M&As, from a microfoundational perspective, published in top-tier peer-reviewed journals from 1985 to 2018. Based on this review, we document what is known about the interrelationships between specific factors with elements of technological innovation and organizational performance outcomes in the context of cross-border M&As. Adding to this, we also illuminate the gaps in the existing literature, and discuss the implications for research and publishing, with fruitful research suggestions for scholars active in this realm.

Our paper contributes to the technological innovation and M&A literature in three ways. First, the systematic literature review section of the paper is the first systematic attempt to organize and map extant research in a way that enables us to see what we know about value creating and value capturing factors for technological innovation through cross-border M&As from a micro-foundational perspective, as well as their impact on organizational performance. Second, we create an integrative conceptual framework that distinguishes interrelates the critical factors with their intermediary effects and the terminal aims. The framework enables us to provide a holistic conceptual treatment of extant literature from a micro-foundational point of view, as well as to identify the different critical factors through which various intermediary effects influence organizational performance. Third, we identify several research gaps and weaknesses of extant literature, in terms of theory, methodology, context and analysis, and provide a set of suggestions and theoretical avenues for further research in order to expand the boundaries of the domain.

The article is structured as follows. We begin with a discussion and analysis of the key methodological choices taken for our systematic review, including the selection of journals, scientific database, keywords and the steps taken until we reach the identification of the final sample of studies. The next section provides a descriptive analysis of the results of this review, identifies various research gaps and suggests problematic areas in extant research that merit further attention. Following, the thematic analysis and data synthesis section reviews and critically analyzes the main findings from the selected studies and provides an integrative framework of extant research. The final section provides suggested additional topics for future research, identified by the authors of the reviewed studies.

Methodology

Systematic review

In this paper we follow the systematic literature review methodology in reviewing extant research, as it considered particularly useful to review key findings of large and complex research areas (Sengers et al. 2016). Adding to this, it provides the means to identify, select, analyze and synthesize existing literature in a rigorous, transparent and replicable (protocol-driven) manner, leading to robust conclusions about the findings and depth of analysis of the reviewed research area (Vrontis and Christofi, 2019; Leonidou et al. 2018; Atewologun et al. 2017; Christofi et al. 2017; Denyer and Tranfield 2009). Adding to this, there are several studies that highlight the advantages of systematic reviews over other review methodologies (for more details see Danese et al. 2018; Nofal et al. 2018; Christofi et al. 2017; Sengers et al. 2016; Wang and Chugh 2014; Tranfield et al. 2003

Review question

A systematic literature review is driven by a defined research question, from which the search strategy in identifying the relevant articles is determined (Leonidou et al. 2018; Sengers et al. 2016; Xiao and Nicholson, 2013). Based on a dialogue between the authors as regards to: a) the identified research gaps; b) the limitations of a prior review study on the link between innovation and M&As, and; c) the importance of undertaking a comprehensive overview of the topic, (all three points are explicitly analyzed in the introduction section), the research question was settled as: “What are the microfoundations of value-creating and value-capturing factors of technological innovation in cross-border M&As, and their impact on organizational performance?”.

Conceptual boundaries and selection criteria

We began the systematic literature review procedure by defining the conceptual boundaries (Denyer and Tranfield, 2009). First, based on our review question, we focused only cross-border mergers and acquisitions. Thus, other types of global strategic partnerships than M&As (i.e.; out-licensing, strategic alliances) were excluded. Second, we focused on the micro-foundations of mergers and acquisitions in enhancing technological innovation, in terms of the individual and team or project level of analysis. The research, though focusing on the micro-foundational factors (triggering technological innovation through cross-border mergers and acquisitions), it did face one critical methodological dilemma. Specifically, whether the systematic review should include only works relating explicitly to micro-foundations or expand the spectrum to include also those that do so implicitly and/or indirectly as well. The former initially appeared to be the obvious choice that was also the more straight forward one, methodologically. A preliminary study, nonetheless, followed by a provisional analysis in this vein, highlighted the need to redesign the criteria to incorporate also the latter. The reason is that micro- and macro-foundations are, on the one hand, less segregated and distinguishable in actual practice. On the (more important) other

hand, the micro-macro relationship was sometimes found to be both symbiotic and of a mutually affecting nature. In other words, macro-foundational factors (e.g. social and organizational culture) were often found in extant research to have a direct effect at the micro-foundational level (individuals and teams). Our research was thus, redesigned to include papers that focused purely on micro-foundational factors, but also some which dealt with macro-foundational factors, but with explicit direct effect at the micro-level e.g. cultural factors affecting individuals' behavior. This methodological choice is justified through the findings themselves, which collectively portray the symbiotic and mutually affecting nature of the macro-micro relationship and is visible throughout the paper e.g. in the 'particularized interrelation of value-creating and value-capturing critical factors of technological innovation in M&As with their intermediary effects' (table 9 and corresponding findings), and the 'preliminary framework of the micro-foundations of value-creating and value-capturing factors of technological innovation in M&As' (figure 4 and corresponding findings). Based on this perspective, we followed the definition of Fellin et al. (2015) which state that the micro-foundations research focuses on how individual-level factors affect companies, how the interaction between individuals leads to emergent, collective, and organization-level performance outcomes, and how these micro-level variables moderate or mediate the relationships between macro-level factors and vice versa. Finally we focused on technological innovation and related concepts that lead to this innovation outcome. Thus, in cases whereas articles focused on knowledge transfer or knowledge acquisition in relation to innovation performance, we included them in our sample.

Next, we determined the exclusion and inclusion criteria of our review. In terms of exclusion criteria, we applied common practices used in top systematic reviews (e.g., Pisani et al. 2017; Foss and Saebi, 2017; West and Bogers, 2014). Thus, we excluded non-academic peer reviewed articles,

such as book chapters and book reviews, summaries of articles, magazines, editorials, interviews, etc. We also excluded non-English articles, as well as articles not related to business. In terms of systematic literature review timeframe, we did not put any restrictions as we wanted to capture all possible relevant studies on the topic from any given time period. As regards to inclusion criteria, the selected studies need to be within the research boundaries of this review. In addition, we included all types of research methods (qualitative, quantitative and mix methods), as well as all types of papers (conceptual, empirical, reviews).

Search strategy

To better understand the micro-foundations of value-creating and value-capturing factors of technological innovation in cross-border M&As, and their impact on organizational performance, this study uses a systematically emerged sample of articles that incorporate inbound paths for technological innovation within such global strategic partnerships. To establish a good understanding of such research, manuscripts were identified from the top International Business, General Management and Innovation journals in order to capture all three components of our review question: the international nature of mergers and acquisitions, the innovation dimension and the general management element of organizational performance. Adding to this, we also included HRM journals, as we hypothesized that due to the micro-foundational focus of our review and the individual level of analysis, HRM journals could pertain relevant studies that focus on individual characteristics or on HRM practices that shape individual competencies and characteristics.

In deciding which journals to include in the review process, we took into consideration previous state-of-the-art reviews published in top business journals, on topics that relate to the disciplines we want to focus on, or are similar with an element from the research topic of this review. Thus,

we included peer-reviewed journals that are considered to be the leading publication outlets of these four research disciplines, thereby basing our selection strategy on widely accepted lists of top business journals applied in published review articles (Pisani et al. 2017). Thus, the first set of publication outlets in our sample consists of International Business journals, and for which, we followed the systematic review strategy of Pisani et al. (2017). In terms of the innovation element, we followed West and Bogers (2014), thus the review included the 25 most impactful and highly cited innovation management and technology journals as calculated by Linton and Thongpapanl (2004). The third group of publication outlets relates to general management journals. Here, we followed the journal selection applied by Foss and Saebi (2017), Pisani et al. (2017), Wang and Rajagopalan (2015), and Haleblian et al. (2009). The fourth and final set of out publication outlets in our sample consists of HRM journals. In this set, we followed the selection strategy applied by Nolan and Garavan (2016). Table 1 shows the journals selected in the first step of the review process for searching potentially relevant articles.

“Insert Table 1 about here”

We used EBSCOhost’s Business Source Premier and Science Direct databases to search for articles from the journals selected. As frequently conducted in literature reviews (e.g., Leonidou et al. 2018; Foss and Saebi, 2017; Christofi et al. 2017; de Loë et al. 2016), we ran a keyword search on the titles, abstracts, and keywords. Our keyword selection was primarily based on previous state-of-the-art literature reviews on individual elements from our reviewed topic (i.e., we used the search keywords applied by Haleblian et al. 2009, as regards to mergers and acquisitions). The application of standard Boolean operators allowed for the development of a single search formula. The keyword search formula used was: (technology OR technological) AND (innovation OR "technological innovation") AND (M&A OR merge OR acquisition OR

acquire OR "mergers and acquisitions"). As shown in Table 1, this step identified a list of 588 unique articles. Articles were screened and included in the final sample if they met all the inclusion criteria. After excluding non-academic articles, duplicates, and non-relevant papers, the final sample of articles from this step was 16.

At the second step we used EBSCOhost's Business Source Premier database to search for articles from the journals selected. We chose this database as our main search source for this step because it provides a strong level of journal coverage of the relevant disciplines (Christoffersen, 2013). Our keyword search was based on two search formulas. The first keyword search formula used at this step was: (technolog* OR knowledge OR innovat*) AND (cross OR border OR international) AND (M&A OR merger OR merge OR acquisition OR acquire OR "mergers and acquisitions" OR M&As), restricted on the titles, abstracts, and keywords of potential studies. The second search formula was used in combination with the first search formula, using the keywords (microfoundations OR micro-foundations OR "individual unit" OR "individual level" OR "employee unit" OR "employee level" OR "team unit" OR "team level" OR "project level" OR "project unit") within the full text of potentially relevant studies. We applied both search strings because our focus was on the micro-foundational level of analysis and we aimed on excluding articles on the macro-level of analysis. Also, our decision to use the second keyword search formula was based on the huge amount of potentially relevant studies generated by using only the first search formula (33,573 studies).

Using these search methods, we identified 1,926 potentially relevant studies. Next, we applied the inclusion and exclusion criteria which minimized the potentially relevant studies to 604. Then, as frequently done in systematic reviews from top business journals (e.g., Soundararajan et al. 2018; Leonidou et al. 2018; Franco-Santos and Otley, 2018; Vaara and Whittington, 2012), we included

studies published in journals with grade 3, 4 and 4* in all categories from the Association of Business Schools' academic journal guide 2018. This quality criterion is common practice in state-of-the-art systematic reviews because: a) publication in these journals ensures that the quality level for the studies included in the review is of the highest standard (Baldacchino et al. 2015; Wilson et al. 2015) and; b) the inclusion of studies from top-tier journals is used frequently for capturing research trends and scholarly debates when conducting literature reviews in a focused research area (Atewologun et al. 2017; Foss et al. 2010). Thus, we read the titles and abstracts of the identified studies that met the quality criterion, following the use of the exclusion and inclusion criteria. In several cases, by reading the abstracts it was hard to identify or comprehend the objectives, results and conclusions of the articles (Thorpe et al. 2005). Hence, we read the introduction and sometimes the conclusions of these studies in order to decide which studies to include for full text reading and processing. This process yielded a total of 174 studies. Of these papers, 168 were then excluded based on full text reading, leaving us with seven relevant articles. Next, to ensure that we did not miss any relevant articles, we conducted an additional step. In the third step, following Nofal et al. (2018) and Hancock et al. (2013), the identified studies from the previous two steps were searched for citations and references relating to other similar studies. The identified studies were reviewed and eligibility for inclusion was determined based on the same process as the previous literature search step. This step yielded four more papers in the final sample. Lastly, to further ensure that our search strategy did not miss any other highly important articles relating to the focus of our review, we followed Nofal et al. (2018) and we showed our list of identified studies to three experts in the domain and asked them to identify any articles that our search strategy had failed to capture. This final step yielded three more papers. The overall search

strategy is shown in Figure 1. The net result of this five-step process is a collection of 30 articles, all of which are indicated with an asterisk (*) in the references section.

“Insert Figure 1 about here”

Descriptive analysis – mapping extant research

Journal outlets and year of publication

Since 1985, the number of articles published every year, except the first decade whereas research on the topic was scarce, had an increasing trend. Table 2 shows a growing trend, with a peak of the number of articles published in 2016 (n = 6). Even though this research domain was initiated more than 30 years ago, the findings show that as a research area technological innovation and cross-border M&A research from a micro-foundational perspective is at an adolescence stage and grows to a fast degree. In detail, the findings show that scholarly research on the subject has increased dramatically in the second half (since 2005) of the existence of this research stream (200% increase compared to the first 18 years) and that 37% of the papers are published in journals in the past 5 years. This also translates to the fact that this research stream did not remain frozen in time, but follows an evolving path over the years, including new constructs, dimensions and contexts of operationalization.

"Insert Table 2 about here"

Moreover, Table 2 illustrates that extant research had been published in a wide array of publication outlets (16 journals) from various disciplines, including, journals from International Business and area studies (23%), General Management, Ethics, Gender and Social Responsibility (20%), Innovation (17%), Strategy (13%), Human Resource Management and Employment Studies (13%), Organization Studies (10%) and Operations and Technology Management (3%), (see Figure 2 for further details). In terms of publication outlet, the Strategic Management Journal is

the host journal for papers on the reviewed topic, with 4 articles (13%), followed by Research Policy, Journal of International Business Studies, International Business Review, Journal of Management Studies and International Journal of Human Resource Management with 3 articles each (10%). Organization Science hosts two articles on the topic (7%), whereas the rest of the journals have one article publication each.

"Insert Figure 2 about here"

Even though the number of published articles has increased in Innovation, Strategy and HRM journals, the scholarly research on micro-level factors of technological innovation and cross-border M&A research is largely confined to international business and general management journals. This somewhat narrow nature of research on the domain indicates that micro-level factors of technological innovation and cross-border M&A research is primarily a concern of IB scholars and M&A research, rather than Innovation or perhaps, OS scholars. This shows a problematic situation whereas, even though the topic is inter-disciplinary in nature and requires input from various domains, the research as such is conducted by university departments individually. Thus, scholars should conduct future research on the topic in collaboration with colleagues from other business departments to advance the topic in various research areas and achieve fruitful outcomes.

Prolific authors and Prominent publications

In order to interpret the surge of micro-foundations of technological innovation through cross-border mergers and acquisitions, two possibilities exist: (1) prolific author(s) enhancing and expanding the knowledge in the domain and (2) call for papers via a special issue on the topic in a peer-reviewed publication outlet (Bhimani et al. 2018). The investigation towards those two possibilities revealed that only a handful of articles were published via a Special Issue on this topic. On the contrary, the findings from the systematic review of extant literature showed that there was

some concentration of peer-reviewed articles on the topic by prolific authors. Table 3 illustrates the authors with two or more publications in this domain.

“Insert Table 3 about here”

We then continued with identifying the most impactful papers in the topic based on their citations. Analysis based on citations is widely applied as a measurement tool of manuscript quality, as the citations of a study constitute a de facto vote of its contribution towards the accumulation and development of knowledge (Crossan and Apaydin, 2010; Saha et al., 2003). Based on this, we explored our sample’s number of citations. The five most cited studies are Ahuja and Katila (2001; 2315 citations); Bresman et al. (1999; 1369 citations); Birkinshaw et al. (2000; 861 citations); Ranft and Lord (2002; 802 citations); and Hitt et al. (1990; 733 citations).

Type of paper, methodology applied, Sample and Industry

Theoretical articles capture about 13% (n=4 papers). The majority of papers are empirical (87%, n=26) in nature. As regards to the methodology applied, the majority use a quantitative methodology approach (67%), followed by a qualitative approach (20%), whereas the remaining empirical papers use a mixed methods approach. No meta-analyses or literature reviews on the topic were identified. These findings are very important as they illustrate that the domain suffers from a lack of theoretical/ conceptual papers, which are significant and the cornerstone in creating a strong theoretical basis for triggering further empirical research and exploring or testing new research relationships, interrelationships, constructs and dimensions for further enhancing the boundaries of the domain. Thus, future scholars should focus on developing theoretical papers and frameworks by drawing from theories by various disciplines, or to build new theories and theoretical perspectives that will trigger the development of the domain into new research paths.

From the systematic review of the literature several significant methodology-related trends emerge that restrain the advancement of research on technological innovation through M&As from a micro-foundational perspective. Of major concern is the number of studies using a qualitative methodology approach. In particular, from the 26 empirical studies in our sample, only six studies (23%) use a qualitative approach. The majority of studies apply a quantitative approach (n=16, 62%), whereas only a handful of studies use both approaches (n=4, 15%). Thus, the topic of our review lacks from an in-depth analysis and exploration, an issue that future scholars should focus on and solve, as the development of in-depth insights for the phenomenon under investigation will help craft strong theoretical foundations and further enhance the domain.

As regards to the industry context, there was a wide variety and an even distribution between service and manufacturing sectors with a focus on various industries in each sector. Adding to this, a very encouraging finding is the large percentage of studies (54%, n=16), that focus on various industries. Five studies (9%) did not provide information on their industrial focus. Table 4 provides a summary of the industry context that each empirical study focus on in our sample.

"Insert Table 4 about here"

Geographic Analysis of Data and Authorship Origin

We identify 75 authors from universities and institutions in 13 countries (see Figure 3), dominated by the United States of America (n=11, 37%), with substantial contributions from the United Kingdom (n=5, 17%). Following, Finland, Austria and Sweden provide two contributions each, whereas the remaining countries provide one contribution each (see Table 5). Moreover, despite the diversity of countries compared to the number of studies in our sample, 63% are authored by a researcher or research team based in a single country, compared to 33% in two countries and only one study in three or more countries (Table 5). This finding that only a fraction of existing

research involves a truly global research team is surprising, given the international nature of the topic in combination with the plethora of global research networks and available technologies to spark collaboration between countries. Taken from a positive perspective, the findings show that there remains fruitful ground for research collaboration on a global basis.

"Insert Figure 3 about here"

"Insert Table 5 about here"

In terms of sample geographic coverage by empirical studies, the number of countries covered in our sample is extremely narrow as it includes 10 countries in total (Table 6). Developed countries are almost solely studied (96%, n=23 out of 24 empirical studies that provide information as regards to the geographical location of their sample). Regarding the number of countries in a single study, there are only four studies that draw data from several countries. Lastly, despite the recent growth in the study of developing markets, only one study focuses on the BRIC (Brazil, Russia, India, and China) context. As the results show, an important research shortcoming is the tendency of scholars to focus on a limited number of countries and regions. An overreliance on few geographical regions such as the USA could possibly lead to false generalizations for other geographical regions for which our knowledge base is embryonic. Adding to this, the findings of both authors' and the sample geographical location show that research coming from or focusing on Australia or Africa is absent. This is a major concern as these two continents cover a huge geographical population for which we know nothing as regards to the reviewed topic, which in turn provides no knowledge for scholars to further build on or practitioners from such areas to be guided by.

"Insert Table 6 about here"

Thematic analysis and data synthesis

The present section proceeds to analyze the findings of the systematic review in order to categorize the findings into eight different themes/foci, as they prevail in the identified thirty major extant works. Specifically, the review has identified the following eight themes/foci that relate to the papers as indicated in table 7. The same table also links papers with themes/foci noting their relevance as primary, secondary and tertiary. *It is noted that though the themes/foci themselves are not necessarily micro-foundational, the present research and table only refer to the relevant papers' aspects that relate to micro-foundational factors.*

"Insert Table 7 about here"

The section subsequently proceeds to collectively and comprehensively present the various established mainstream theories utilized by the above research works. Conclusively and more importantly, this section ends with a synthesis of the findings into a preliminary multidimensional framework of the micro-foundations of value-creating and value-capturing factors of technological innovation in mergers and acquisitions (and their impact on organizational performance).

Regarding the approach and methodological philosophy underlying the above, our systematic review provides the foundation for constructing this type of framework. This as, per our findings, extant research is typified by complexity and fragmentation that calls for a more wide-ranging understanding of the subject within a comprehensive framework. The findings, in fact, further to the aforementioned complexity and fragmentation, have identified a natural, albeit complex interrelation of subjects; with, even papers with common or similar foci/themes, investigating their mutual subject(s) using a different order of aims, means and ends. The imperative, thus, of providing a complete set of factors, categorised, and interrelated within a comprehensive framework is evident.

Stemming from the above, we apply an appropriate methodology that facilitates the stated aims of the process. Following the procedural approach of Crossan and Apaydin (2010), we start with the main objective of the theories i.e. describing, predicting and/or justifying the researched phenomena within a discipline; establishing in this course their interrelationships and any causalities linking the various elements (Bunge, 1997; Sutton & Staw, 1995). We therefore apply a sequential relationship approach that acts as a building block (Crossan & Apaydin, 2010). Based on this sequential perspective on our conceptual framework, a set of determinants in the form of aims, means and ends, irrevocably leads to our phenomenon of interest, that is, the microfoundations of value-creating and value-capturing factors of technological innovation in mergers and acquisitions, and their impact on organizational performance; frequently as the micro-foundational applications of macro-foundational contexts.

Hereafter, the section presents the eight/themes foci, along with the essence of the works that related to these. The papers therein are those that have the specific theme/focus as their primary one. *And though the themes themselves are largely macro-foundational ones, the selected papers presented handle these in terms of their micro-foundational aspects and effects, with the data synthesis presenting this micro-foundational perspective alone.* Further, as a matter of comprehensiveness and accuracy, and in relation to the hereafter presented ‘themes’, table 8 presents the various mainstream and widely recognised theories applied throughout the selected works.

Finally, the subsequent thematic categorization is neither absolute, nor definitive. It is one of various possible ones; and was selected among other alternative configurations, based on specific criteria, including clarity, terminological visibility within extant works, practicability and applicability of constructs, comprehension, overlap minimization, and multi-perspective outlook.

"Insert Table 8 about here"

F1: Social & Organizational Culture

The first theme identified covers the topic of ‘social and organisational culture’ which is a recurrent theme throughout the systematic review. The present research’s literature review included five papers, which had this as their primary focus, plus another nine that dealt with it as secondary or third. Thus, McCarthy and Aalbers focus on the effects of geographic and cultural difference, and the subject of ‘foreignness’ and ‘newness’, presenting in their empirical findings how these two factors affect the micro-foundational level, leading to higher innovation performance and productivity, as different cultures have a tendency to approach the same problem in different ways, or simply because ‘newness’ leads to innovation. Sears (2018), though also primarily focusing on the ends of absorptive *capacity and overlapping and sharing of knowledge (i.e. themes 2 and 5)*, *they particularly focus on the factors affecting/creating communication capabilities that accelerate integrative innovation (innovative activities in conjunction with acquirers)*. They identify cultural and communication factors as key to absorptive capacity, and highlight particularly (a) language differences as delaying the development of knowledge-sharing routines at the micro-foundational level, and thus, integrative innovations, while expediting independent innovations, and (b) the deterioration of information asymmetries between targets and acquirers as leading to greater opportunities for acquirer intervention into target innovative activities that delay independent innovation. Björkman, Stahl and Vaara, E. (2007) also research (potential) absorptive capacity, which they term as consisting of both ability and motivation on behalf of the receiving organisations’ individuals to obtain and assimilate capabilities. They found that a significant cultural gap between the acquired and the acquiring employees is linked with lower levels of potential absorptive capacity, and that social integration mechanisms will reduce the problems that

are consequent to cultural differences on potential absorptive capacity. They further find that notable cultural differences lead to complementary capabilities that fit with and enhance each other. Moreover, they conclude that (a) high social integration is correlated with higher levels of capability transfer, (b) high levels of potential absorptive capacity is associated with greater capability transfer, and (c) high levels of interunit capability complementarity correlates with greater capability transfer between the two firms (acquired and acquiring). Ahuja and Katila, R. (2001) focus on 'Relatedness' (common skills, shared languages, and similar cognitive structures) and their non-linear impact on innovation output. For high relatedness, they find that innovation output will increase with greater relatedness, but beyond an output this will decrease as relatedness will become greater. For moderate relatedness they find that they enhance the variety of combinations that the firm can use, while maintaining the commonality that facilitates interaction the two firms' knowledge bases. Low relatedness, they state to contribute little to subsequent innovation performance. Finally, Yahiaoui, Chebbi and Weber (2016), pay particular attention to cultural differences and communication in the post-acquisition phase, and to the management of both organisational and national cultural differences. They identify four human relations actions for four distinct cultural end states, namely 'Pluralism', 'Integration', 'Assimilation' and 'Transformation'. In the first, partner companies coexist; in the second partners blend current cultures together; in the third one company absorbs the other; and in the fourth partner companies abandon key elements of their past cultures to adopt fresh norms and values.

F2: Technological Overlap/Similarity

The second theme identified covers the topic of '*technological Overlap/Similarity*' which also arose as a prominently repeating theme throughout the systematic review. Colombo and Rabbiosi (2014) study the subject of 'Technological similarity' and find that this facilitates the replacement

of incompetent and/or less valuable managers, leading to higher innovation performance and productivity. Sears (2018) answers the question of whether communication facilitating characteristics of technological acquisitions differentially affect the speed to the initial post-acquisition integrative innovation and the initial post-acquisition independent innovation. In this context, they conclude that the extent to which partners have developed overlapping knowledge bases substantially affects the acquirer's ability to leverage the acquired's knowledge. They state, in fact, that technological overlap signifies a common vocabulary, conceptual knowledge, and experience which drives efficient interaction and enhances the ability of the firm to rapidly establish the knowledge-sharing routines necessary for integrative innovations. They also conclude that technological overlap can reduce the negative effects that foreign acquisitions and language difference have on knowledge-sharing routines' development. Park, Howard and Gomulya (2018) investigate the micro-effect of M&A on the retention of target firm (acquired's) scientists. They find that the degree of complexity and similarity of the acquired knowledge characteristics is a factor, with greater success being achieved regarding new knowledge creation when the acquired's knowledge is more complex and more different. Finally, Kapoor and Lim (2007) investigate how knowledge-based and incentive-based perspectives complement each other to explain the effects of acquisitions on the productivity of inventors from acquired firms, and, among others, they conclude that higher innovation productivity is achieved when there is greater overlap in routines and moderate overlap in skills.

F3: HRM and Social Capital

The third conspicuous theme stemming from the systematic review is 'HRM and social capital'. Hasegawa (2000), identifies opportunities for innovation in management (through M&As) as stemming from professional management, collective decision-making, strategic orientation that

foster HR development and innovation, and working conditions improvement, including physical conditions, training and job satisfaction. Correspondingly, they identify also opportunities for innovation in production systems management as stemming from flexible teams, workers' multi-skilling and ever-lasting skill improvement, grade based on skills and team performance, and autonomy of the individual worker. Dao et al. (2017) research shared team and task mental models as informal coordination mechanisms, and exploitation and exploration as innovation activities. They find that, shared team and task mental models both positively influence exploitation, while, in terms of exploration, only shared team mental models are useful. They also conclude that informal coordination's effect is only contextual. Paruchuri and Eisenman (2012) focus on the microfoundations of firm R&D capabilities in terms of the inventor networks in a merger, and study how the activities underlying firms' R&D change in the aftermath of a merger. They find that mergers cause anxiety to inventors that reduces their ability to process information and trigger particular responses. These responses are shown to have varying effects on the extent to which inventors' knowledge would be used in R&D activities. Inventors, thus, decrease information processing and reduce the number of channels through which they seek information. Despite the association of such knowledge with richness, flow in communication channels seems to be the primary mechanism for determining its impact. Paruchuri, Nerkar and Hambrick (2006) study acquisition integration and productivity losses in the technical core, and find that productivity of corporate scientists of acquired companies leads to social status and centrality loss, which is disruptive, and leads to the most severe productivity drops. Ranft and Lord (2002) investigate how the nature of the acquired firms' knowledge-based resources, and acquisition implementation, have both independent and interactive effects on the successful appropriation of technologies and capabilities by the acquirer. They deduce that symbolic and cultural autonomy at the individual

and team levels inhibits the transfer of the acquired firm's technologies and capabilities that are based on tacit and/or socially complex knowledge. They also conclude that frequent and rich communications facilitate the safeguarding of the acquired firm's technologies and capabilities, and determine how and to what extent managers facilitate coordination and cross-fertilization of knowledge and activities between the acquired firm and the acquirer. Additionally, they conclude that the proportion of managers from the acquirer appointed to key post-acquisition management roles affects the post-acquisition autonomy of the acquired firm, as well as the retention of acquired employees; and that greater tacitness and/or social complexity of knowledge underlying an acquired firm's technologies and capabilities is positively associated with the use of financial incentives aimed at retention. Retention is further found to be enhanced by financial incentives such as "stay-put" bonuses, long-term contracts with bonuses payable over a period of time, stock option grants exercisable at some future date, and increased base salaries. Further retention-enhancing actions included the evidence of the acquirer's commitment to the acquisition e.g. generating positive media attention about the acquired organization and its new role, frequent visits of top executives, support for travel by the acquired firms' managers and employees to visit the parent firm's facilities, and commitments to invest in the acquired organization, such as support for training and development. Nikandrou and Papalexandris (2007) study the impact of M&A experience on strategic HRM practices and organisational effectiveness to find that (also) rate of innovation is affected by the HR factors of increased HR involvement in strategic decisions, formalisation of HR practices, training and development activities, line management devolvement and internal labour market opportunities. Finally, Aklamanu, Degbey and Tarba (2016) study the role of HRM and social capital configuration for knowledge sharing in post-M&A integration and find that relational, cognitive and structural social capitals affect employees' knowledge-sharing

abilities. And continue to conclude that knowledge sharing is facilitated by the M&A integration team members selection methods (based on referrals versus relevant experience, competence and skills) and the M&A integration team members training methods (team-based formal and informal trainings in a classroom setting versus informal training based on learning-by-doing, hands-on experience, observation and coaching).

F4: Social Community & Integration

The fourth prominent theme is 'Social community and integration'. Verbeke (2010) investigates international acquisition success through the social community and dominant logic dimensions. He argues that the social community perspective reflects two dimensions of international acquisition success, with a reverse knowledge seeking and innovation capacity-building purpose. In the dominant logic dimension he finds that the efficient and effective integration of the two firms requires the acquirer to institutionalize some of its routines (ways of doing things) in the new united organisation. He further concludes that the acquirer should pay a balanced attention to building a unified social community and to achieving the needed commonality in dominant logic, towards improved knowledge sharing and innovation capacity. Due to this being sometimes dysfunctional, attention may need to shift towards building a social community for efficient and effective acquired firm's integration. Bresman, Birkinshaw and Nobel (1999) in one of the earlier works support that mutual adaptation and soft bundling mechanisms (dual-direction socialization) unified a social community, facilitating intra-MNE knowledge flows and innovation capacity. They further prescribed a communication process, visits and transfers towards enhanced integration, which help overcome uneasy relationships, solve inter-cultural problems, positively impact the acquired employees' respect for their acquirers, and reinforce their belief regarding their individual future. Finally, they argue for normative integration or socialization, that is the

development of common sets of values and beliefs as the means to better accumulation and/or assimilation of new knowledge. Bauer, Matzler and Wolf (2016) research integration to find different effects of human and task integration on the innovation outcome after the acquisition. Human integration (creation of shared identity and satisfaction) was actually found to be 'rather destructive', while task integration (transfer and sharing of resources and capabilities) was found to be beneficial for innovation output. Birkinshaw, Bresman and Håkanson (2000), also deal extensively with human versus task integration, with somewhat different results. They identify the key factors affecting task integration (identification and fulfilment of operational synergies) as being: the initial plans for integration, integrating mechanisms used, problems encountered during integration, task specialization during integration, ongoing level of communication, and autonomy of main acquired unit. They also found these to lead to: interaction limitation between the firms, creation of stronger interdependencies between them, and a generally more successful acquisition. Regarding human integration (facilitating positive attitudes towards the integration among employees), they identify the factors of: prior experience, visibility and continuity of leadership, communication process during integration, acquired personnel retained, voluntary personnel loss and integrating mechanisms. Their effect is noted as leading to cultural convergence and mutual respect, greater interdependencies between the two firms, and also a generally positive impact on acquisition success. They finally also identify the combined task and human mechanisms as being: international personnel meetings, mixed project teams, joint R&D meetings, seminars with a cultural awareness topic, rotation of R&D employees, and joint R&D personnel training programmes. Finally, Björkman, Stahl and Vaara (2007) describe social integration mechanisms as comprising personnel rotation, short-term visits, participation in joint training programmes and meetings, membership in cross-unit teams, task forces and committees, involvement of the

acquired employees in management discussions, and quality of communication. They further support that greater cultural differences are related to lower levels of social integration, and that utilisation of social integration mechanisms moderates the relationship between social integration and cultural differences. Moreover, they find that mechanisms of social integration can diminish the negative consequences on potential absorptive capacity by cultural differences. Finally, they find that greater social integration is associated with improved capability transfer between the acquiring and the acquired organization, and that greater operational integration reduces the negative impact of culture-related differences on potential absorptive capacity.

F5: Transfer of Knowledge, Skills and Technology

The fifth theme, *‘Transfer of knowledge, skills and technology’* is inherently central to this research’s aim, and it indirectly related to all other themes as well. We, thus, hereby present the works that have been found to more explicitly hold the theme as their primary focus. James, Georghiou and Metcalfe (1998) identify integrating technology issues in the M&A managerial decision making process as influencing acquisition success and the impact of acquisition on the innovative capabilities of the firm. They predict efficiency gains through rationalising production and R&D facilities and/or the technological synergies that may result from new combinations of knowledge, skills and expertise. Paruchuri and Eisenman (2012) focus on the post-merger intra-firm inventor collaboration network and find that prominent and widely available knowledge has an increased knowledge impact; that less easily accessible knowledge has a decreased knowledge impact; and that inventors’ greater centrality in the intra-firm network has an increased knowledge impact. It is also noted here, that some of the above-reviewed works also have knowledge transfer as central to their research (primary focus in table 7): Ranft and Lord (2002) handle the subject of knowledge transfer in the context of social capital and communications (see above ‘HRM and

social capital' theme), Bauer, Matzler and Wolf (2016) deal with knowledge transfer in the context of human and task integration (see above 'Social and community integration' theme), Ahammad et al. (2016) deal with knowledge transfer in terms of cultural distance and employee retention (see above 'Social and organisational culture' and 'HRM and social capital' themes), and Aklamanu, Degbey and Tarba (2016) deal with knowledge transfer in terms of social capital (see above 'HRM and social capital' theme).

F6: Structure, Processes and Size

'Structure, processes and size' constitutes the sixth theme of the systematic review and focuses, like the previous themes, on works dealing with micro-foundational aspect and effects of macro-environmental factors. Puranam and Srikanth (2007) investigate the grouping of organizational units together within administrative boundaries through structural integration. They identify the coordination mechanisms of programming, hierarchy, and feedback as, when effectively applied, enabling acquirers to successfully leverage what the acquired firm knows. They also link the acquirers' (greater) experience with its greater ability to mitigate the disruptive effects of autonomy loss entailed by integration. Lee and Kim (2016) among other factors, research the effects of acquirer firm size on innovation, and find that small firms as acquirers, due to their simplicity and flexibility are advantageous for cross-functional communication pertaining to market-driven innovation; while large firms as acquirers, due to their developed routines, they are advantageous for communication within individual departments pertaining to technology-driven innovation. Grimpe (2007) particularly researches structural integration strategies and finds that firms revert to three such strategies, based on the need for strategic interdependence and firm autonomy: adjustment, symbiosis and absorption. He further supports that structural linking of R&D units provides the structural basis for exploiting value growth potentials from improved NPD

processes, makes it easier to transfer technological resources, reduces coordination efforts, and facilitates collaboration between the R&D employees. Moreover, he links process redesign 'adjustment strategy' (wide-ranging reorganization efforts in R&D focusing on common processes, structures, and systems) with the outcomes of economic success and high integration quality. Finally, he finds that there is a positive relationship between the standardization of systems with all success variables, with a consistent unification resulting in information, incentive, and control benefits that lead to value growth.

F7: Strategy

'Strategy' and its effects at the micro-foundational level constitute the seventh theme. James, Georghiou and Metcalfe (1998) study (also) strategic aspects of technology management during M&As and conclude that the degree of integration of technology issues in the M&A managerial strategic decision making process influence acquisition success or failure and the impact of acquisition on the innovative capabilities of the firm. They further state the need to train technology managers in technology strategy so as to maximize value from the acquired technological assets. The authors also prescribe involving technology managers throughout the acquisition process to assure a realistic valuation and post-acquisition strategy planning; advise on targeting synergies to achieve efficiency gains through rationalising production and R&D facilities and/or the technological synergies that may result from new combinations of knowledge, skills and expertise; and highlight the imperative of forecast real costs and benefits (further to direct acquisition ones), especially 'soft' ones (at the individual level: time, effort, communication, values, org. culture, moral, change itself etc.). Grimpe (2007) studies strategic micro-foundational aspects through his above-reviewed work (see 'Structure, processes and size' theme) in the form of strategic structural linkage, adjustment strategy and systems standardisation. Inkpen, Sundaram and Rockwood

(2000) study cross-border acquisitions of technology assets and highlight, as strategic key factors in acquisition integration success of cross-border technology acquisitions: acquirer communication styles and vision creation, networking and socialization, and the target employees' sense of 'who is in charge'. They specifically underline communication as vital to ensuring that target employees comprehend the reasons underlying the acquisition, and they denote networking as 'critical to success' through the facilitation of mutual help in new markets, duplication avoidance, special licensing agreements, and common technical standards.

F8: Top Management and Leadership

The final theme arising from the systematic review is 'Top management and leadership', both at the micro-foundational level of leaders and at the company micro-foundational level (individuals and teams). Klavans, Shanley and Evan (1985) , in the oldest of the included works, focus on internal corporate venture management and identify managerial bonuses as correlated to venture success/performance, as also were 'other' indirect or non-monetary incentives. Venture success/performance was also linked to the characteristics of the venture managers, and specifically the 'generalist' managers (as opposed to higher experience and educational background ones). Moreover, their research found that corporate venture departments that adopted mechanisms to identify and exploit opportunities for innovation were more prone to major innovations. Finally, they concluded that growth by acquisitions and growth through internal ventures are not mutually exclusive, with innovative firms doing both. Hasegawa (2000) identifies management styles, 'professional management', collective decision-making and strategic attitude in development and innovation as maximising opportunities for innovation in management through acquisition, and proceed to also make HRM-related strategic recommendations (see 'HRM and social capital' theme section above). Hayton and Zahra (2005) cover the subject of inherited

knowledge and the level of human capital of the top management teams. Individually, they find the latter to increase the potential and realised absorptive capacity, the acquisition and exploitation of new knowledge, the assimilation or understanding of the new knowledge, the transformation of new knowledge through integration and recodification, and exploitation through implementation within new products and processes. These were also found to be enhanced, in the collective/group context, through the diversity of the top management human capital. Hitt, Hoskisson and Ireland (1990) focus specifically on the subject of management commitment. They don't focus on the effect of leadership commitment on M&A success, but, reversely, in a more micro-foundational perspective, on the effects of M&As on managers' commitment to innovation in the acquiring firm. They conclude that the process of the acquisition itself, and the outcome conditions, affect managerial commitment to innovation. And specifically, the degree to which acquisitions act as a substitute for innovation, energy and attention required during negotiations, increased use of leverage, increased size, and greater diversification may affect managers' 'dime and risk' orientations. And because of these effects, managers may reduce their commitment to innovation. Graebner, M. E. (2004) researched how acquired leaders create value in the integration of technology firms. They found that acquired managers play a key role in securing two types of value: 'expected' and 'serendipitous'. In assisting towards these values, acquired leaders achieve the advantages of both integration and autonomy; in parallel facilitating their firms' simultaneous experience of exploration and exploitation. Finally, Zhang et al. (2015), study the effect of leadership style on talent retention during M&A integration (in the Chinese context), concluding that the authoritative, coaching, task-focused and relationship-focused approaches have a positive influence on talent retention and effective post-M&A integration. Moreover, they find that talent retention is a result of authoritative leaders' use of communication, leaders adopting a coaching

style use of an incentive structure, task-focused leaders' use of position and performance, relationship-focused leaders emphasis on the guanxi network, communication and an incentive structure.

An integrative conceptual framework

The findings of the systematic review are hereby collectively and comprehensively presented in a preliminary multidimensional framework (Figure 4) of the micro-foundations of value-creating and value-capturing factors of technological innovation in mergers and acquisitions (and their impact on organizational performance). Specifically, the framework synthesizes the knowledge of the thirty key works into a single schematic representation, comprising of the eight afore-described themes, the critical factors identified by the extant research, their intermediary effects, their terminal aims, and the mainstream theories utilised. Moreover, the factors, effects and aims are uniquely collectively interrelated, allowing a comprehensive schematic representation of the dynamics of the elements and forces underlying technological innovation at the micro-foundational level; purposefully including (rather than excluding) the macro-foundational causes where they have a micro-foundational effect.

'Insert Figure 4 About Here'

The framework (Figure 4) starts with the complex interrelation between the various extant theories utilised by the selected papers, per each of the categorised 'themes'. This is essentially a combined schematic representation of the findings presented above in tables 7 and 8. The framework subsequently portrays the 'critical factors' pertaining to the microfoundations of value-creating and value-capturing factors of technological innovation in mergers and acquisitions, and their impact on organizational performance. These are shown as they stem from the systematic review, in relation to each of the identified 'themes'. Each of these set of critical factors thereafter lead to

a corresponding set of ‘intermediary effects’. The detailed presentation of the individual ‘critical factors’, and more importantly, their specific interrelation to the individual ‘intermediary effects’ could not be incorporated to the figure, for practical purposes. They are, thus presented in the complete form in table (9). The figure concludes with the ‘terminal aims’ relating to microfoundational technological innovation in M&As, as they stem from the selected papers.

"Insert Table 9 about here"

Limitations and Further research

Like any other systematic review, the findings reported in this study should be considered within the limitations context frequent to such review methodologies. First, the findings from this systematic review were identified from specific journals in step one, either applied from existing state-of-the-art reviews, or based on the authors’ judgement, as well as from ABS3 or 4 ranked journals from EBSCOhost Business Source Premier. We recognize that such an approach has its limitations as we may have omitted some relevant studies. However, we believe that a different journal selection would not have altered our findings and main conclusions, as we developed our selection based on a careful examination of the journal coverage and based on earlier reviews from top journals. Adding to this, steps 3 and four, further ensure that our review process covers the majority of relevant research. Despite this, future scholars could review related literature from other databases and journals. Second, the filtering process applied might have also excluded some possible relevant research. However, we are confident that the rigorous process of our systematic review has reduced the possibility that the omitted research would have contained findings that would critically change our conclusions. Third, our review is limited to the micro-foundational perspective of technological innovation through M&As. Thus, we have excluded several articles that focus on the macro-level perspective. Hence, future research could provide a systematic

review and an integrative framework that includes both micro and macro perspectives. Despite these limitations, our study offered various fruitful research directions throughout the descriptive analysis, thematic analysis and data synthesis, for scholars to pursue in the future. Apart from these future directions, we identified several other future research directions proposed by the authors of the reviewed studies, which we summarize in Table 10. In particular, based on the review results, these proposed directions for future research have been identified and stated by various researchers throughout the years, however, they still remain under-researched by the scholar community.

"Insert Table 10 about here"

Conclusion

To conclude, in this paper, we set out to examine the disparate literature on technological innovation through cross-border M&As, from a micro-foundational perspective. Our review summarizes the key value creating and value capturing factors that enable technological innovation in the context of M&As, as well as its intermediary effects and terminal aims. We then advanced the domain by creating an integrative conceptual framework for scholars to further build on and practitioners to be guided by. This framework also helped us address two issues with extant research in this research stream: inferences of association and fragmentation. We hope our review will motivate researchers to further pursue this research area and expand the boundaries of the domain into new research paths.

References

Ahammad, M. F., Tarba, S. Y., Liu, Y., & Glaister, K. W. (2016). Knowledge transfer and cross-border acquisition performance: The impact of cultural distance and employee retention. *International Business Review*, 25(1), 66-75*.

Ahuja, G., & Katila, R. (2001). Technological acquisitions and the innovation performance of acquiring firms: A longitudinal study. *Strategic Management Journal*, 22(3), 197-220*.

Aklamanu, A., Degbey, W. Y., & Tarba, S. Y. (2016). The role of HRM and social capital configuration for knowledge sharing in post-M&A integration: A framework for future empirical investigation. *International Journal of Human Resource Management*, 27(22), 2790-2822*.

Alsaad, A. K., Yousif, K. J., & AlJedaiah, M. N. (2018). Collaboration: the key to gain value from IT in supply chain. *EuroMed Journal of Business*, 13(2), 214-235.

Atewologun, D., Kutzer, R., Doldor, E., Anderson, D., & Sealy, R. (2017). Individual-level Foci of Identification at Work: A Systematic Review of the Literature. *International Journal of Management Reviews*, 19(3), 273-295.

Baldacchino, L., Ucbasaran, D., Cabantous, L., & Lockett, A. (2015). Entrepreneurship research on intuition: a critical analysis and research agenda. *International Journal of Management Reviews*, 17(2), 212-231.

Bauer, F., Matzler, K., & Wolf, S. (2016). M&A and innovation: The role of integration and cultural differences—A central European targets perspective. *International Business Review*, 25(1), 76-86*.

Bhimani, H., Mention, A. L., & Barlatier, P. J. (2018). Social media and innovation: A systematic literature review and future research directions. *Technological Forecasting and Social Change*.

Birkinshaw, J., Bresman, H., & Håkanson, L. (2000). Managing the post-acquisition integration process: How the human iintegration and task integration processes interact to foster value creation. *Journal of Management Studies*, 37(3), 395-425*.

Björkman, I., Stahl, G. K., & Vaara, E. (2007). Cultural differences and capability transfer in cross-border acquisitions: The mediating roles of capability complementarity, absorptive capacity, and social integration. *Journal of International Business Studies*, 38(4), 658-672*.

Bresciani, S., Ferraris, A., & Del Giudice, M. (2018). The management of organizational ambidexterity through alliances in a new context of analysis: Internet of Things (IoT) smart city projects. *Technological Forecasting and Social Change*, 136, 331-338.

Bresman, H., Birkinshaw, J., & Nobel, R. (1999). Knowledge transfer in international acquisitions. *Journal of International Business Studies*, 30(3), 439-462*.

Bunge, M. (1997). Mechanism and explanation. *Philosophy of the Social Sciences*, 27, 410-465.

Campanella, F., Del Giudice, M., Thrassou, A. and Vrontis, D. (2016), “Ambidextrous organizations in the banking sector: an empirical verification on banks’ performance and conceptual development”, *International Journal of Human Resource Management*, doi: 10.1080/09585192.2016.1239122.

Christoffersen, J. (2013). A review of antecedents of international strategic alliance performance: synthesized evidence and new directions for core constructs. *International Journal of Management Reviews*, 15(1), 66-85.

Christofi, M., Leonidou, E., & Vrontis, D. (2017). Marketing research on mergers and acquisitions: a systematic review and future directions. *International Marketing Review*, 34(5), 629-651.

Christofi, M., Vrontis, D., Leonidou, E., & Thrassou, A. (2018). Customer engagement through choice in cause-related marketing: A potential for global competitiveness. *International Marketing Review*. doi: <https://doi.org/10.1108/IMR-04-2018-0133>

Colombo, M. G., & Rabbiosi, L. (2014). Technological similarity, post-acquisition R&D reorganization, and innovation performance in horizontal acquisitions. *Research Policy*, 43(6), 1039-1054*.

Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47(6), 1154-1191.

Danese, P., Manfè, V., & Romano, P. (2018). A Systematic Literature Review on Recent Lean Research: State-of-the-art and Future Directions. *International Journal of Management Reviews*, 20(2), 579-605.

Dao, M. A., Strobl, A., Bauer, F., & Tarba, S. Y. (2017). Triggering innovation through mergers and acquisitions: the role of shared mental models. *Group & Organization Management*, 42(2), 195-236*.

de Loë, R. C., Melnychuk, N., Murray, D., & Plummer, R. (2016). Advancing the state of policy Delphi practice: A systematic review evaluating methodological evolution, innovation, and opportunities. *Technological Forecasting and Social Change*, 104, 78-88.

Denyer, D. and Tranfield, D. (2009). Producing a systematic review. In Buchanan, D. and Bryman, A. (eds), *The Sage Handbook of Organizational Research Methods*. London: Sage, pp. 671–689.

Dezi, L., Battisti, E., Ferraris, A., & Papa, A. (2018). The link between mergers and acquisitions and innovation: A systematic literature review. *Management Research Review*, 41(6), 716-752.

Felin, T., Foss, N. J., & Ployhart, R. E. (2015). The microfoundations movement in strategy and organization theory. *Academy of Management Annals*, 9(1), 575-632.

Ferraris, A., Santoro, G., & Bresciani, S. (2017). Open innovation in multinational companies' subsidiaries: the role of internal and external knowledge. *European Journal of International Management*, 11(4), 452-468.

Ferraris, A., Santoro, G., Bresciani, S., & Carayannis, E. G. (2018). HR practices for explorative and exploitative alliances in smart cities: evidences from smart city managers' perspective. *Management Decision*, 56(6), 1183-1197.

Foss, N. J., & Saebi, T. (2017). Fifteen years of research on business model innovation: How far have we come, and where should we go?. *Journal of Management*, 43(1), 200-227.

Foss, N.J., Husted, K. and Michailova, S. (2010). Governing knowledge sharing in organizations: levels of analysis, governance mechanisms, and research directions. *Journal of Management Studies*, 47(3), 455–482.

Franco-Santos, M., & Otley, D. (2018). Reviewing and theorizing the unintended consequences of performance management systems. *International Journal of Management Reviews*, 20(3), 696-730.

Graebner, M. E. (2004). Momentum and serendipity: How acquired leaders create value in the integration of technology firms. *Strategic Management Journal*, 25(8-9), 751-777*.

Graebner, M. E., Eisenhardt, K. M., & Roundy, P. T. (2010). Success and failure in technology acquisitions: Lessons for buyers and sellers. *Academy of Management Perspectives*, 24(3), 73-92.

Graebner, M., Heimeriks, K., Huy, Q., & Vaara, E. (2017). The process of post-merger integration: A review and agenda for future research. *Academy of Management Annals*, 11(1), 1-32.

Grimpe, C. (2007). Successful product development after firm acquisitions: The role of research and development. *Journal of Product Innovation Management*, 24(6), 614-628*.

Hagedoorn, J., & Duysters, G. (2002). External sources of innovative capabilities: the preferences for strategic alliances or mergers and acquisitions. *Journal of Management Studies*, 39(2), 167-188.

Haleblian, J., Devers, C. E., McNamara, G., Carpenter, M. A., & Davison, R. B. (2009). Taking stock of what we know about mergers and acquisitions: A review and research agenda. *Journal of Management*, 35(3), 469-502.

Hancock, J. I., Allen, D. G., Bosco, F. A., McDaniel, K. R., & Pierce, C. A. (2013). Meta-analytic review of employee turnover as a predictor of firm performance. *Journal of Management*, 39(3), 573-603.

Hasegawa, H. (2000). Global acquisition and knowledge transfer—a case study of company D1. *International Business Review*, 9(5), 587-598*.

Hayton, J. C., & Zahra, S. A. (2005). Venture team human capital and absorptive capacity in high technology new ventures. *International Journal of Technology Management*, 31(3-4), 256-274*.

Hitt, M. A., Hoskisson, R. E., & Ireland, R. D. (1990). Mergers and acquisitions and managerial commitment to innovation in M-form firms. *Strategic Management Journal*, 11(5), 29-47*.

Huang, Z., Zhu, H., & Brass, D. (2016). Cross-border acquisitions and the asymmetric effect of power distance value difference on long-term post-acquisition performance. *Strategic Management Journal*, 38(4) 972-991.

Humphery-Jenner, M., Sautner, Z., & Suchard, J. A. (2017). Cross-border mergers and acquisitions: The role of private equity firms. *Strategic Management Journal*, 38(8), 1688-1700.

Inkpen, A. C., Sundaram, A. K., & Rockwood, K. (2000). Cross-border acquisitions of US technology assets. *California Management Review*, 42(3), 50-71*.

James, A. D., Georghiou, L., & Metcalfe, J. S. (1998). Integrating technology into merger and acquisition decision making. *Technovation*, 18(8-9), 563-591*.

- Kapoor, R., & Lim, K. (2007). The impact of acquisitions on the productivity of inventors at semiconductor firms: A synthesis of knowledge-based and incentive-based perspectives. *Academy of Management Journal*, 50(5), 1133-1155*.
- Karagouni, G. (2018). Production technologies and low-technology knowledge-intensive venturing. *EuroMed Journal of Business*, 13(1), 75-85.
- Klavans, R., Shanley, M., & Evan, W. M. (1985). The Management of Internal Corporate Ventures-Entrepreneurship and Innovation. *Columbia Journal of World Business*, 20(2), 21-27*.
- Lee, J., & Kim, M. (2016). Market-driven technological innovation through acquisitions: The moderating effect of firm size. *Journal of Management*, 42(7), 1934-1963*.
- Leonidou, E., Christofi, M., Vrontis, D., & Thrassou, A. (2018). An integrative framework of stakeholder engagement for innovation management and entrepreneurship development. *Journal of Business Research*.
- Linton, J. D., and N. T. Thongpapanl. 2004. Ranking the technology innovation management journals. *Journal of Product Innovation Management*, 21(2): 123–39.
- McCarthy, K. J., & Aalbers, H. L. (2016). Technological acquisitions: The impact of geography on post-acquisition innovative performance. *Research Policy*, 45(9), 1818-1832*.
- Nielsen, B. B., Asmussen, C. G., & Weatherall, C. D. (2017). The location choice of foreign direct investments: Empirical evidence and methodological challenges. *Journal of World Business*, 52(1), 62-82.
- Nikandrou, I., & Papalexandris, N. (2007). The impact of M&A experience on strategic HRM practices and organisational effectiveness: Evidence from Greek firms. *Human Resource Management Journal*, 17(2), 155-177*.
- Nofal, A. M., Nicolaou, N., Symeonidou, N., & Shane, S. (2018). Biology and Management: A Review, Critique, and Research Agenda. *Journal of Management*, 44(1), 7-31.
- Nolan, C. T., & Garavan, T. N. (2016). Human resource development in SMEs: a systematic review of the literature. *International Journal of Management Reviews*, 18(1), 85-107.
- Park, H. D., Howard, M. D., & Gomulya, D. M. (2018). The impact of knowledge worker mobility through an acquisition on breakthrough knowledge. *Journal of Management Studies*, 55(1), 86-107*.
- Paruchuri, S., & Eisenman, M. (2012). Microfoundations of firm R&D capabilities: A study of inventor networks in a merger. *Journal of Management Studies*, 49(8), 1509-1535*.
- Paruchuri, S., Nerkar, A., & Hambrick, D. C. (2006). Acquisition integration and productivity losses in the technical core: Disruption of inventors in acquired companies. *Organization Science*, 17(5), 545-562*.
- Pisani, N., Kourula, A., Kolk, A., & Meijer, R. (2017). How global is international CSR research? Insights and recommendations from a systematic review. *Journal of World Business*, 52(5), 591-614.
- Puranam, P., & Srikanth, K. (2007). What they know vs. what they do: How acquirers leverage technology acquisitions. *Strategic Management Journal*, 28(8), 805-825*.

- Ranft, A. L., & Lord, M. D. (2002). Acquiring new technologies and capabilities: A grounded model of acquisition implementation. *Organization Science*, 13(4), 420-441*.
- Rozen-Bakher, Z. (2018). The trade-off between synergy success and efficiency gains in M&A strategy. *EuroMed Journal of Business*.
- Saha, S., Saint, S. and Christakis, D. A. (2003). 'Impact factor: a valid measure of journal quality'. *Journal of the Medical Librarian Association*, 91, 42–60.
- Scuotto, V., Del Giudice, M., della Peruta, M. R., & Tarba, S. (2017). The performance implications of leveraging internal innovation through social media networks: An empirical verification of the smart fashion industry. *Technological Forecasting and Social Change*, 120, 184-194.
- Sears, J. B. (2018). Post-acquisition integrative versus independent innovation: A story of dueling success factors. *Research Policy*, 47(9), 1688-1699*.
- Sengers, F., Wieczorek, A. J., & Raven, R. (2016). Experimenting for sustainability transitions: A systematic literature review. *Technological Forecasting and Social Change*.
- Shin, S. R., Han, J., Marhold, K., & Kang, J. (2017). Reconfiguring the firm's core technological portfolio through open innovation: focusing on technological M&A. *Journal of Knowledge Management*, 21(3), 571-591.
- Soundararajan, V., Jamali, D., & Spence, L. J. (2018). Small business social responsibility: A critical multilevel review, synthesis and research agenda. *International Journal of Management Reviews*, 20(4), 934-956.
- Soundararajan, V., Jamali, D., & Spence, L. J. (2018). Small business social responsibility: A critical multilevel review, synthesis and research agenda. *International Journal of Management Reviews*, 20(4), 934-956.
- Sutton, R. I., & Staw, B. M. (1995). What theory is not. *Administrative Science Quarterly*, 40, 371–384.
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207-222.
- Vaara, E. and Whittington, R. (2012). Strategy-as-practice: taking social practices seriously. *Academy of Management Annals*, 6(1), pp. 285–336.
- Verbeke, A. (2010). International acquisition success: Social community and dominant logic dimensions. *Journal of International Business Studies*, 41(1), 38-46*.
- Vrontis, D., & Christofi, M. (2019). R&D internationalization and innovation: A systematic review, integrative framework and future research directions. *Journal of Business Research*.
- Wang, C.L. and Chugh, H. (2014). Entrepreneurial learning: past research and future challenges. *International Journal of Management Reviews*, 16, pp. 24–61
- Wang, Y., & Rajagopalan, N. (2015). Alliance capabilities: review and research agenda. *Journal of Management*, 41(1), 236-260.

Weber, Y., Tarba, S. Y., & Bachar, Z. R. (2011). Mergers and acquisitions performance paradox: the mediating role of integration approach. *European Journal of International Management*, 5(4), 373-393.

Webster, J., & Watson, R. T. (2002). Analyzing the past to prepare for the future: Writing a literature review. *MIS Quarterly*, 26(2), xiii-xxiii.

West, J., & Bogers, M. (2014). Leveraging external sources of innovation: a review of research on open innovation. *Journal of Product Innovation Management*, 31(4), 814-831.

Wilson, J., Arshed, N., Shaw, E., & Pret, T. (2017). Expanding the domain of festival research: A review and research agenda. *International Journal of Management Reviews*, 19(2), 195-213.

Yahiaoui, D., Chebbi, H., & Weber, Y. (2016). HR practices, context and knowledge transfer in M&A. *International Journal of Human Resource Management*, 27(20), 2415-2435*.

Zhang, J., Ahammad, M. F., Tarba, S., Cooper, C. L., Glaister, K. W., & Wang, J. (2015). The effect of leadership style on talent retention during merger and acquisition integration: Evidence from China. *International Journal of Human Resource Management*, 26(7), 1021-1050*.

Zhu, H., Ma, X., Sauerwald, S., & Peng, M. W. (2019). Home country institutions behind cross-border acquisition performance. *Journal of Management*, 45(4), 1315-1342.

Table 1. Top Business Journals by Focused Area Searched for Literature Review - Step 1

| Technological Innovation journals | Generic Management Journals | HRM Journals | IB Journals | Other Business Journals |
|--|---|--|---|--|
| Academy of Management Journal | Human Relations | British Journal of Industrial Relations | Global Strategy Journal | Accounting Review |
| Academy of Management Review | Journal of Applied Psychology | Economic and Industrial Democracy | International Business Review | American Journal of Sociology |
| Administrative Science Quarterly | Journal of Business Venturing | European Journal of Industrial Relations | International Marketing Review | American Sociological Review |
| American Economic Review | Journal of Management | Human Resource Management (USA) | Journal of International Business Studies | Journal of Accounting & Economics |
| California Management Review | Journal of Management Studies | Human Resource Management Journal(UK) | Journal of International Management | Journal of Accounting Research |
| Economic Journal | Journal of Occupational and Organizational Psychology | Human Resource Management Review | Journal of International Marketing | Journal of Economic Perspectives |
| Harvard Business Review | Journal of Organizational Behavior | Industrial and Labor Relations Review | Journal of World Business | Journal of Finance |
| IEEE Transactions on Engineering Management | Strategic entrepreneurship journal | Industrial Law Journal | Management International Review | Journal of Financial and Quantitative Analysis |
| Industrial and Corporate Change | Management Science | Industrial Relations Journal | | Journal of Financial Economics |
| International Journal of Technology Management | Organization Studies | Industrial Relations: A Journal of Economy and Society | | Journal of Vocational Behavior |
| Journal of Marketing | Organizational Behavior and Human Decision Processes | International Journal of Human Resource Management | | Rand Journal of Economics |
| Journal of Marketing Research | Personnel Psychology | New Technology, Work and Employment | | |
| Journal of Political Economy | | Work and Occupations | | |
| Journal of Product Innovation Management | | Work, Employment and Society | | |
| Long Range Planning | | | | |
| Management Science | | | | |
| MIS Quarterly | | | | |
| MIT Sloan Management Review | | | | |
| Organization Science | | | | |
| R&D Management | | | | |
| Research Policy | | | | |
| Research-Technology Management | | | | |
| Strategic Management Journal | | | | |
| Technological Forecasting and Social Change | | | | |
| Technovation | | | | |

Technological innovation journals are based on the ranking of the premier 25 journals for technological innovation research, as developed by Linton and Thongpapanl (2004) and applied by West and Bogers (2014). The IB journal list was based on Pisani et al. (2017). The HRM journal list was based on authors' decision to include all ABS3 and ABS4 journals from the Human Resource Management and Employment Studies Section of the ABS 2018 Ranking List. The Generic Management journal list was based on state-of-the-art literature reviews developed by Pisani et al. (2017), Wang and Rajagopalan (2015) and Haleblan et al. 2009. For other business journals, we used the journal sampling applied by Haleblan et al. (2009).

Table 2: Evolutionary development of micro-foundational research on cross-border mergers and acquisitions and technological innovation

| YEAR | AMJ | CMR | GOM | IJHRM | Tec | IBR | JWB | JIBS | RP | JMS | HRM | JPIM | SMJ | OS | IJTM | JM | |
|--------------|------------|------------|------------|--------------|------------|------------|------------|-------------|-----------|------------|------------|-------------|------------|-----------|-------------|-----------|-----------|
| 1985 | | | | | | | 1 | | | | | | | | | 1 | |
| 1986 | | | | | | | | | | | | | | | | 0 | |
| 1987 | | | | | | | | | | | | | | | | 0 | |
| 1988 | | | | | | | | | | | | | | | | 0 | |
| 1989 | | | | | | | | | | | | | | | | 0 | |
| 1990 | | | | | | | | | | | | | 1 | | | 1 | |
| 1991 | | | | | | | | | | | | | | | | 0 | |
| 1992 | | | | | | | | | | | | | | | | 0 | |
| 1993 | | | | | | | | | | | | | | | | 0 | |
| 1994 | | | | | | | | | | | | | | | | 0 | |
| 1995 | | | | | | | | | | | | | | | | 0 | |
| 1996 | | | | | | | | | | | | | | | | 0 | |
| 1997 | | | | | | | | | | | | | | | | 0 | |
| 1998 | | | | | 1 | | | | | | | | | | | 1 | |
| 1999 | | | | | | | | 1 | | | | | | | | 1 | |
| 2000 | | 1 | | | | 1 | | | | 1 | | | | | | 3 | |
| 2001 | | | | | | | | | | | | | 1 | | | 1 | |
| 2002 | | | | | | | | | | | | | | 1 | | 1 | |
| 2003 | | | | | | | | | | | | | | | | 0 | |
| 2004 | | | | | | | | | | | | | 1 | | | 1 | |
| 2005 | | | | | | | | | | | | | | | 1 | 1 | |
| 2006 | | | | | | | | | | | | | | 1 | | 1 | |
| 2007 | 1 | | | | | | | 1 | | | 1 | 1 | 1 | | | 5 | |
| 2008 | | | | | | | | | | | | | | | | 0 | |
| 2009 | | | | | | | | | | | | | | | | 0 | |
| 2010 | | | | | | | | 1 | | | | | | | | 1 | |
| 2011 | | | | | | | | | | | | | | | | 0 | |
| 2012 | | | | | | | | | | 1 | | | | | | 1 | |
| 2013 | | | | | | | | | | | | | | | | 0 | |
| 2014 | | | | | | | | | 1 | | | | | | | 1 | |
| 2015 | | | | 1 | | | | | | | | | | | | 1 | |
| 2016 | | | | 2 | | 2 | | | 1 | | | | | | | 6 | |
| 2017 | | | 1 | | | | | | | | | | | | | 1 | |
| 2018 | | | | | | | | | 1 | 1 | | | | | | 2 | |
| Total | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 3 | 3 | 3 | 1 | 1 | 4 | 2 | 1 | 1 | 30 |

| |
|--|
| |
|--|

AMJ=Academy of Management Journal, **CMR**=California Management Review, **GOM**=Group & Organization Management, **IJHRM**=International Journal of Human Resource Management, **Tec**=Technovation, **IBR**=International Business Review, **JWB**=Journal of World Business, **JIBS**=Journal of International Business Studies, **RP**=Research Policy, **JMS**=Journal of Management Studies, **HRM**=Human Resource Management (USA), **JPIM**=Journal of Product Innovation Management, **SMJ**=Strategic Management Journal, **OS**=Organization Science, **IJTM**=International Journal of Technology Management, **JM**=Journal of Management.

Table 3: Top authors (with two or more articles)

| Author name | No. of papers |
|-------------------------|---------------|
| Tarba Shlomo | 4 |
| Ahammad Faisal Mohammad | 2 |
| Bauer Florian | 2 |
| Birkinshaw Julian | 2 |
| Bresman Henrik | 2 |
| Glaister W. Keith | 2 |
| Paruchuri Srikanth | 2 |

Table 4: Industrial analysis of papers reviewed

| Citation | Industry |
|-------------------------------------|--|
| Klavans et al. (1985) | No indication |
| James et al. (1998) | Chemicals, materials, electronics and utility |
| Bresman et al. (1999) | chemicals, decanter, production automation, |
| Hasegawa (2000) | Textile |
| Inkpen et al. (2000) | communications- and computers-related industries |
| Birkinshaw et al. (2000) | No indication |
| Ahuja and Katila, (2001) | Chemicals |
| Ranft and Lord, (2002) | Computer software, biotechnology, computer services, electronics |
| Graebner, (2004) | Networking hardware, communications software, financial software, content management software |
| Hayton and Zahra, (2005) | High technology |
| Paruchuri et al. (2006) | Pharmaceutical |
| Puranam and Srikanth, (2007) | Information technology (computing and communications) and pharmaceutical |
| Kapoor and Lim, (2007) | semiconductor |
| Grimpe, (2007) | Chemicals and pharmaceuticals, accounting, engineering, electronics, industrial process management and control, automotive, plastics manufacturing |
| Nikandrou and Papalexandris, (2007) | Food and beverage, retail industry, tourism sector, information systems, telecommunications, banks |
| Paruchuri and Eisenman, (2012) | Pharmaceutical |
| Colombo and Rabbiosi, (2014) | Medium and high-tech industries: aerospace, biomedical instruments, chemicals, electrical machinery, electronics, energy production, farm machinery, household appliances, industrial materials, instruments, motor vehicles, non-ferrous metals, pharmaceuticals, plastics, rubber, specialty chemicals, steel, textile machinery |
| Zhang et al. (2015) | No indication |
| McCarthy and Aalbers, (2016) | Aerospace and defence, computers and office machinery, pharmaceuticals and electronics and communications |
| Lee and Kim, (2016) | Industrial and commercial machinery, computer equipment, electronic and other electrical equipment and components |
| Bauer et al. (2016) | No indication |
| Ahammad et al. (2016) | Consumer products and services, energy and power, financial services, healthcare, high technology, industrial materials, media and entertainment, real estate, retail, consumer staples, telecommunications |
| Yahiaoui et al. (2016) | No indication |
| Dao et al. (2017) | Long-living industries (e.g., machinery industry) |
| Sears, (2018) | Manufacturing |
| Park et al. (2018) | Computer, semiconductor, biotech, and medical devices |

Table 5: Authorship characteristics

| Authorship Characteristics | No. | % |
|----------------------------|-----|-----|
| <hr/> | | |
| Number of authors | | |
| One | 6 | 20% |
| Two | 11 | 37% |
| Three or more | 13 | 43% |
| Number of countries | | |
| One | 19 | 63% |
| Two | 10 | 33% |
| Three or more | 1 | 3% |
| Number of Institutions | | |
| One | 10 | 33% |
| Two | 12 | 40% |
| Three or more | 8 | 27% |

Table 6: Sample geographical location of empirical papers

| Citation | Sample Geographical Location |
|-------------------------------------|---|
| Klavans et al. (1985) | USA |
| James et al. (1998) | UK |
| Bresman et al. (1999) | Sweedden |
| Hasegawa (2000) | UK |
| Inkpen et al. (2000) | USA |
| Birkinshaw et al. (2000) | Sweden |
| Ahuja and Katila, (2001) | 30 European, 26 American, and 16 Japanese firms |
| Ranft and Lord, (2002) | USA |
| | |
| Graebner, (2004) | No indication |
| | |
| Hayton and Zahra, (2005) | USA |
| Paruchuri et al. (2006) | USA |
| Puranam and Srikanth, (2007) | USA |
| Kapoor and Lim, (2007) | USA |
| Grimpe, (2007) | Germany Switzerland |
| Nikandrou and Papalexandris, (2007) | Greece |
| Paruchuri and Eisenman, (2012) | USA |
| Colombo and Rabbiosi, (2014) | Europe - No other information |
| Zhang et al. (2015) | China |
| McCarthy and Aalbers, (2016) | USA |
| Lee and Kim, (2016) | USA |
| Bauer et al. (2016) | Germany, Austria and Switzerland |
| Ahammad et al. (2016) | UK |
| Yahiaoui et al. (2016) | France |
| Dao et al. (2017) | German-speaking part of Europe |
| Sears, (2018) | USA |
| Park et al. (2018) | USA |

Table 7: Extant major works' foci categorisation

| Paper No. | Citation | PAPERS' FOCI (excluding macro-foundations) | | | | | | | |
|-----------|-------------------------------------|---|---------------------------------------|---------------------------|-----------------------------------|---|----------------------------------|-------------|--------------------------------|
| | | 1. Social & Organizational Culture | 2. Technological Overlap / Similarity | 3. HRM and Social Capital | 4. Social Community & Integration | 5. Transfer of Knowledge, Skills and Technology | 6. Structure, Processes and Size | 7. Strategy | 8. Top Management / Leadership |
| 1. | Colombo and Rabbiosi, (2014) | | Primary | | | | | | |
| 2. | McCarthy and Aalbers, (2016) | Primary | | | | | | | |
| 3. | Sears, (2018) | Primary | Primary | | Secondary | Tertiary | | | |
| 4. | Klavans et al. (1985) | | | | | | | | Primary |
| 5. | Verbeke, (2010) | Tertiary | | Tertiary | Primary | | | | |
| 6. | Bresman et al. (1999) | Tertiary | | Secondary | Primary | Tertiary | | Secondary | |
| 7. | Hasegawa (2000) | | | Primary | | | | | Primary |
| 8. | Park et al. (2018) | | Primary | Tertiary | | | Tertiary | Tertiary | |
| 9. | Hayton and Zahra, (2005) | Secondary | Tertiary | | | Secondary | | | Primary |
| 10. | Ahuja and Katila, (2001) | Primary | | | Secondary | Tertiary | Secondary | | |
| 11. | Puranam and Srikanth, (2007) | | | | | Secondary | Primary | Tertiary | |
| 12. | Hitt et al. (1990) | | | | | | | Secondary | Primary |
| 13. | Lee and Kim, (2016) | Tertiary | Secondary | | | | Primary | Secondary | |
| 14. | James et al. (1998) | | Tertiary | Secondary | | Primary | | Primary | Secondary |
| 15. | Kapoor and Lim, (2007) | | Primary | | | | Secondary | Tertiary | |
| 16. | Grimpe, (2007) | Secondary | | | Tertiary | | Primary | Primary | |
| 17. | Dao et al. (2017) | Tertiary | | Primary | Secondary | Tertiary | Secondary | | |
| 18. | Paruchuri and Eisenman, (2012) | | | Primary | | Primary | | | |
| 19. | Graebner, (2004) | | | | | | | Secondary | Primary |
| 20. | Paruchuri et al. (2006) | | | Primary | | | | | |
| 21. | Ranft and Lord, (2002) | Secondary | | Primary | Secondary | Primary | | Tertiary | Tertiary |
| 22. | Zhang et al. (2015) | | | Secondary | | | | | Primary |
| 23. | Nikandrou and Papalexandris, (2007) | | | Primary | | | Secondary | Tertiary | |
| 24. | Inkpen et al. (2000) | | | | | | | Primary | Secondary |

| | | PAPERS' FOCI (excluding macro-foundations) | | | | | | | |
|------------------|--------------------------|--|--|----------------------------------|--|--|---|--------------------|---------------------------------------|
| Paper No. | Citation | 1. Social & Organizational Culture | 2. Technological Overlap / Similarity | 3. HRM and Social Capital | 4. Social Community & Integration | 5. Transfer of Knowledge, Skills and Technology | 6. Structure, Processes and Size | 7. Strategy | 8. Top Management / Leadership |
| 25. | Bauer et al. (2016) | Secondary | | | Primary | Primary | | | |
| 26. | Ahammad et al. (2016) | Secondary | | Secondary | | Primary | | Tertiary | |
| 27. | Birkinshaw et al. (2000) | | | Secondary | Primary | | Secondary | Tertiary | |
| 28. | Björkman et al. (2007) | Primary | Secondary | | Primary | | | | |
| 29. | Yahiaoui et al. (2016) | Primary | | | Secondary | Secondary | Tertiary | | |
| 30. | Aklamanu et al. (2016) | | | Primary | | Primary | | | Secondary |

Table 8: Mainstream theories applied in the systematic review

| No | Theories applied |
|-----------|--|
| 1 | Theory of recombinant invention |
| 2 | Transaction cost theory |
| 3 | Relative absorptive capacity; Selective intervention |
| 4 | No indication |
| 5 | Unified social community; Dominant logic |
| 6 | Social community |
| 7 | No indication |
| 8 | Knowledge-based view of the firm |
| 9 | Organisational learning theory; Human capital; Absorptive capacity |
| 10 | Technological innovation; Resource-based view |
| 11 | Agency theory; Structural integration |
| 12 | No indication |
| 13 | Resource-based view |
| 14 | No indication |
| 15 | Knowledge-based view; Agency theory ; Property rights; Incentive theory |
| 16 | No indication |
| 17 | Social comparison; Relative standing; Social identity theory; Shared mental models |
| 18 | Intra-firm inventor collaboration network |
| 19 | No indication |
| 20 | Knowledge based view |
| 21 | Knowledge based view |
| 22 | Talent Management; Leadership styles theories |
| 23 | No indication |
| 24 | No indication |
| 25 | Hofstede's cultural dimensions |
| 26 | Transfer theory perspective; Hofstede's (1980) national culture values framework |
| 27 | Hofstede's six dimensions of organizational culture |
| 28 | Hofstede's (1980) national culture values framework |
| 29 | No indication |
| 30 | Social capital theory; Human capital theory; Social network theory |

Table 9: A particularized interrelation of value-creating and value-capturing critical factors of technological innovation in M&As with their intermediary effects

| | Critical factors | Intermediary effects |
|--|--|--|
| Social & Organizational Culture | Foreignness | Newness |
| | Cultural and communication factors | Integrative innovation Absorptive <i>capacity</i> |
| | Language | Knowledge-sharing routines |
| | Information asymmetries | Acquirer intervention in target innovative activities |
| | Motivation to acquire and assimilate capabilities | Acquirer intervention in target innovative activities |
| | Ability to acquire and assimilate capabilities | Acquirer intervention in target innovative activities |
| | Cultural gap | Potential absorptive capacity Complementary capabilities |
| | Social integration mechanisms | Potential absorptive capacity Capability transfer |
| | Interunit capability | Capability transfer |
| | 'Relatedness' (common skills, shared languages, and similar cognitive structures) | Variety of combinations Interaction |
| | Human relations actions | Pluralism Integration Assimilation Transformation |
| Technological Overlap / Similarity | Technological similarity | Replacement of incompetent managers |
| | Communication facilitating characteristics | Integrative innovation Independent innovation |
| | Technological overlap | Efficient interaction Knowledge-sharing routines Target firm knowledge leverage |
| | Knowledge complexity & similarity | New knowledge creation |
| | Knowledge-based and incentive-based perspectives | Acquired firms' inventors' productivity |
| | Routines overlap | Acquired firms' inventors' productivity |
| | Skills overlap | Acquired firms' inventors' productivity |
| HRM and Social Capital | Professional management Collective decision-making HR strategic orientation Working conditions (physical, training, job satisfaction) | Innovation in management |
| | Flexible teams Workers' multi-skilling Grade based on skills and performance Individual worker autonomy | Innovation in production systems management |
| | Shared team and task mental models as informal coordination mechanisms | Exploitation and exploration as innovation activities |
| | Inventors' anxiety | Information processing Number of information-seeking channels Flow in communication channels |
| | Acquired's scientists' social status and centrality loss | Productivity of scientists of acquired companies |
| | Nature of the acquired's knowledge-based resources | Independent and interactive effects on the successful appropriation of technologies and capabilities by the acquirer |

| | | |
|---|--|--|
| | Symbolic and cultural autonomy at the individual and team levels | Inhibits transfer of acquired technologies and capabilities that are based on tacit and/or socially complex knowledge |
| | Communications' frequency and richness | Safeguard of the acquired's technologies and capabilities Facilitate coordination and cross-fertilization of knowledge and activities |
| | Proportion of managers in post-acquisition management roles | Acquired's autonomy Acquired's retention |
| | Tacitness and/or social complexity of knowledge underlying acquired's technologies and capabilities | Use of financial retention incentives |
| | Financial incentives: - <i>'Stay-put' bonuses</i> - <i>Long-term contracts and bonuses</i> - <i>Long-term stock option grants</i> - <i>Increased base salaries</i> - <i>Evident acquirer's commitment to the acquisition:</i> - <i>Positive media attention about the acquired</i> - <i>Frequent visits of top executives</i> - <i>Support for travel to acquired managers and employees</i> - <i>Commitments to invest in the acquired</i> | Retention |
| | HR Tactics: - <i>Increased HR involvement in strategic decisions</i> - <i>Formalisation of HR practices</i> - <i>Training and development activities</i> - <i>Line management devolvement</i> - <i>Internal labour market opportunities</i> | Rate of innovation |
| | HR integration: - Relational, cognitive and structural social capitals Integration team members selection methods (based on referrals versus relevant experience, competence and skills) - Integration team members training methods (team-based formal and informal trainings in a classroom setting versus informal training based on learning-by-doing, hands-on experience, observation and coaching) | Employees' knowledge-sharing abilities |
| Social Community & Integration | Social community perspective: <i>Reverse knowledge seeking</i> <i>Innovation capacity-building</i> | International acquisition success |
| | Dominant logic dimension: - <i>Acquirer's routine institutionalization</i> - <i>Acquirer's balanced unified social community</i> - <i>Acquirer's commonality in dominant logic</i> | Knowledge sharing and innovation capacity |
| | Mutual adaptation Soft bundling mechanisms (dual-direction socialization) | Unified social community |
| | Communication process Visits | Overcome uneasy relationships Solve inter-cultural problems |

| | | |
|---|--|--|
| | Transfers | Acquired employees' respect for their acquirers Assurance of individuals' future |
| | Common sets of values and beliefs | Normative integration or socialization |
| | Human integration (creation of shared identity and satisfaction): – <i>Prior experience</i> – <i>Visibility and continuity of leadership</i> – <i>Communication process</i> – <i>Acquired personnel retained</i> – <i>Voluntary personnel loss</i> – <i>Integrating mechanisms</i> | Cultural convergence Mutual respect Greater interdependencies General impact on acquisition success |
| | Task integration (identification and realization of operational synergies): – <i>Integration plans</i> – <i>Integrating mechanisms</i> – <i>Problems encountered</i> – <i>Task specialization</i> – <i>Level of communication</i> – <i>Acquired's autonomy</i> | Interaction limitation Interdependencies General successful acquisition |
| | Combined task and human mechanisms: – <i>International staff meetings</i> – <i>Joint R&D meetings</i> – <i>Cultural awareness seminars</i> – <i>Mixed project teams</i> – <i>R&D personnel rotation</i> – <i>Joint R&D training programmes</i> | Social integration Operational integration Potential absorptive capacity |
| | HRM actions: – <i>Personnel rotation</i> – <i>Short-term visits</i> – <i>Participation in joint training and meetings</i> – <i>Cross-unit teams, task forces and committees</i> – <i>Acquired employees' involvement in mgmt discussions</i> – <i>Quality of communication</i> | Capability transfer between the acquiring and the acquired firm |
| Transfer of Knowledge, Skills and Technology | Rationalising production and R&D facilities Rationalising technological synergies (of knowledge, skills and expertise) | Efficiency gains |
| | Prominent and widely available knowledge Less accessible knowledge Inventors' centrality in the intra-firm network | Intra-firm inventor collaboration network knowledge impact |
| Structure, Processes and Size | Coordination mechanisms of programming, hierarchy, and feedback | Leverage of acquired firm knowledge |
| | Acquirers' experience | Autonomy loss disruptions |
| | Small firms as acquirers (due to their simplicity and flexibility) | Cross-functional communication pertaining to market-driven innovation |
| | Large firms as acquirers (due to their developed routines) | Communication within individual departments pertaining to technology-driven innovation |
| | Structural integration strategies of R&D units: – <i>Symbiosis</i> – <i>Absorption</i> – <i>Adjustment</i> | Strategic interdependence Organizational autonomy Value growth potentials Technological resources transfers Coordination efforts |

| | | |
|------------------------------------|--|--|
| | | R&d employees collaboration |
| | Process redesign 'adjustment strategy' (reorganization efforts of a wide range in R&D with central focus on shared processes, systems and structures) | Economic success Integration quality |
| | Standardization of systems | Information benefits Incentive benefits Control benefits |
| Strategy | Integration of technology issues in the M&A managerial strategic decision making process | |
| | Train technology managers in technology strategy | Value from the acquired technological assets |
| | Involving technology managers throughout the acquisition process | Realistic valuation and post-acquisition strategy planning |
| | Targeting synergies Rationalising production and r&d facilities | Efficiency gains |
| | Forecast real costs and benefits (further to direct acquisition ones), especially 'soft' ones (at the individual level: time, effort, communication, values, org. Culture, moral, change itself etc.) | Effective and accurate technology predictions |
| | Acquirer communication styles Vision creation Networking and socialization 'Who is in charge'. Comprehension of reasons underlying acquisition | Mutual help in new markets Duplication avoidance Special licensing agreements Common technical standards |
| Top Management / Leadership | Managerial bonuses 'Other' indirect or non-monetary incentives Characteristics of managers ('generalist' vs 'specialists') Mechanisms to identify and exploit opportunities for innovation | Venture success/performance |
| | Growth by acquisitions Vs growth through internal ventures | Innovative firms doing both |
| | Management styles Professional management Collective decision-making Strategic attitude in development and innovation | Opportunities for innovation in management through acquisition |
| | Level of human capital of the top management Diversity of the top management human capital | Potential absorptive capacity Realised absorptive capacity Acquisition and exploitation of new knowledge Assimilation of new knowledge Transformation of new knowledge through integration and recodification Exploitation through implementation |
| | Acquisition process Outcome conditions Acquisitions acting as a substitute for innovation Energy and attention required during negotiations Increased use of leverage Increased size Greater diversification | Managerial commitment to innovation |
| | Acquired managers role | 'Expected' value 'serendipitous' value |

| | | |
|--|---|--|
| | | Integration and autonomy Exploration and exploitation |
| | Leadership styles: – <i>Authoritative</i> – <i>Coaching</i> – <i>Task-focused</i> – <i>Relationship-focused</i> | Talent retention |

Table 10: Additional avenues for future research

| Citation | Avenues for future research |
|-------------------------------------|--|
| Hayton and Zahra, (2005) | <p>To consider alternative indicators of human capital of top management.</p> <p>To examine the effect of human capital at various levels of the firm and its impact on organisational learning processes.</p> <p>To investigate the influence of willingness on top management, (i.e., incentives coupled with abilities) as these will improve our understanding of the impact of managerial roles on the acquisition and exploitation of new capabilities.</p> |
| Paruchuri et al. (2006) | <p>To examine the disruptive effects of acquisition integration to various employee groups in different settings.</p> <p>To examine the possible benefits of acquisitions on inventor learning, knowledge transfer, and renewed stimulation</p> <p>To study the managerial interventions that might be taken to minimize the negative consequences</p> |
| Puranam and Srikanth, (2007) | <p>To analyze the effect of acquisition on the continued productivity of inventors or in the utilization of their knowledge in innovation activity.</p> <p>To explore the limits of using process overlays and other formal coordination mechanisms to compensate for the discrete nature of organizational grouping choices in acquisitions.</p> |
| Nikandrou and Papalexandris, (2007) | <p>To examine the ways reward systems are applied in organizations involved in M&As for motivation purposes and human issues and investigate their effect on firm performance.</p> <p>To treat M&A as a control variable, by examining and comparing HR practices used in successful organizations with and with no M&A experience.</p> |
| Paruchuri and Eisenman, (2012) | <p>M&As vary in relation to prior experience of the organization or the board members or with respect to sizes of the merged firms. Experience is significant because inventors' prior experience with M&As may also affect M&A outcomes and technological innovation – experienced inventors may be able to understand the activities and behavior types that better underlie successful knowledge transfer compared to non-experience inventors. Thus, future research could explore differences in micro-processes in mergers affected by such characteristics.</p> <p>To qualitatively explore the impact of organizational disruptions on new knowledge generation processes to access such tacit knowledge to a larger extent.</p> |
| Colombo and Rabbiosi, (2014) | <p>To assess which specific R&D reorganization actions (if any) need to be implemented to reap these benefits. In other words, this link might be mediated by R&D reorganization actions that differ from those examined here, such as the establishment of inter-organizational teams, the introduction of loci of social interaction between the R&D personnel in the acquiring and acquired firms, or other coordination arrangements.</p> |

| | |
|------------------------|--|
| Aklamanu et al. (2016) | To investigate the influence of other forms of people management practices that may influence individuals' motivations and opportunities to share knowledge in M&A integration |
| Dao et al. (2017) | How tacit and codified experiences impact the relationships of SMMs on exploration and exploitation |
| Sears, (2018) | To investigate the development and evolution of the knowledge sharing routines in M&As |
| Park et al. (2018) | <p>To study how the retention of different ranks of scientist, e.g., scientists holding managerial positions versus laboratory positions, or different types of knowledge workers, e.g., scientists versus manufacturing experts, would influence post-acquisition innovation performance.</p> <p>To compare and contrast how knowledge complexity and similarity may affect knowledge transfer outcomes following different access modes.</p> <p>To examine the issue of knowledge destruction, or more broadly knowledge loss as a result of acquisition or exchanges between firms. In the context of technology acquisitions, it is possible that human capital retention may introduce other complexities that may actually deteriorate knowledge creation outcomes, potentially leading to greater likelihood of developing knowledge flops.</p> |

Figure 1: Search strategy

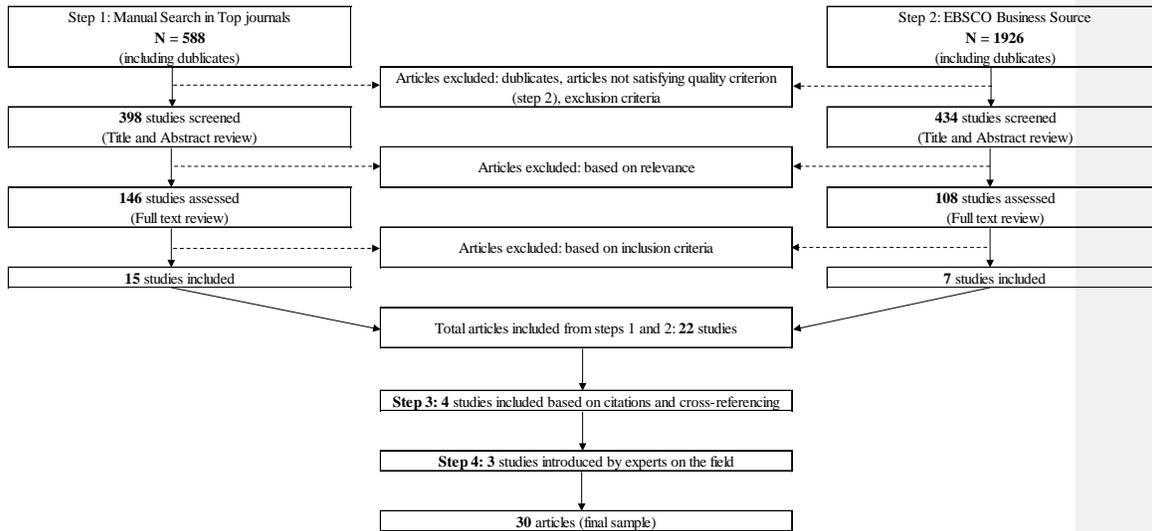
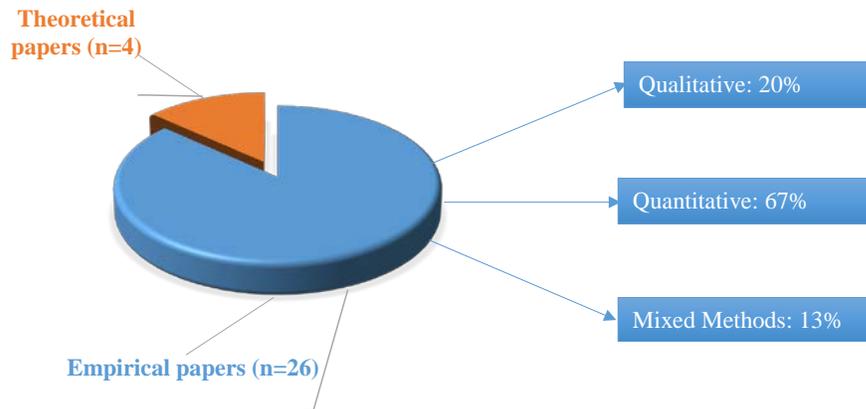


Figure 2: Field of research based on publication outlets



Figure 3: Type of paper and methodology applied



Formatted: Space After: 8 pt, Line spacing: Multiple 1.08 li

Figure 34: First author's Geographical Location

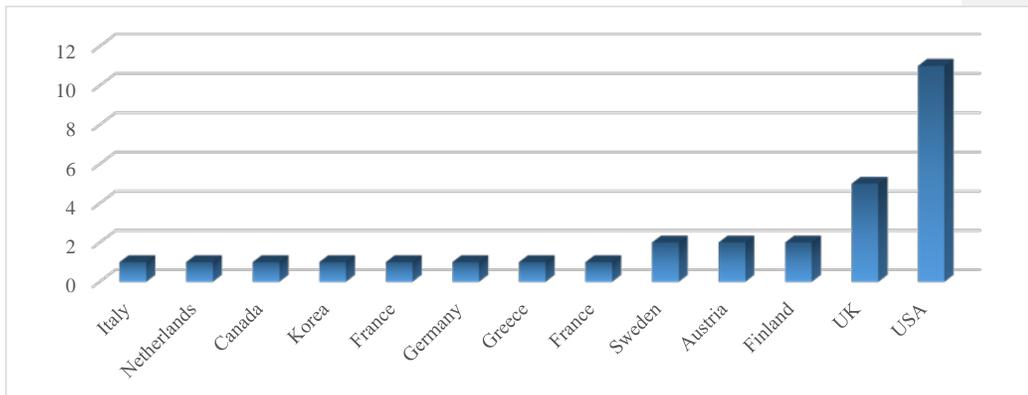


Figure 4: A preliminary framework of the micro-foundations of value-creating and value-capturing factors of technological innovation in M&As

