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Redirecting Research Efforts on the Diversification-Performance Linkage:

The Search for Synergy

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Abstract

We review the literature on the diversification-performance (D-P) relationship to a) propose that the time is ripe for a renewed attack on understanding the relationship between diversification and firm performance, and b) outline a new approach to attacking the question. Our paper makes four main contributions. First, through a review of the literature we establish the inherent complexities in the D-P relationship and the methodological challenges confronted by the literature in reaching its current conclusion of a non-linear relationship between diversification and performance. Second, we argue that to better guide managers the literature needs to develop along a complementary path – whereas past research has often focused on answering the big question of does diversification affect firm performance, this second path would focus more on identifying the precise micro-mechanisms through which diversification adds or subtracts value. Third, we outline a new approach to the investigation of this topic, based on (a) identifying the precise underlying mechanisms through which diversification affects performance; (b) identifying performance outcomes that are "proximate" to the mechanism that the researcher is studying, and (c) identifying an appropriate research design that can enable a causal claim. Finally, we outline a set of directions for future research.

Introduction

In this paper we review the literature on the diversification-performance relationship to propose two theses. First, we argue that the time is ripe for a renewed attack on understanding the relationship between diversification and firm performance. Second, we outline an approach to attacking the question that is different from the traditional multi-industry regression of performance against corporate diversification as a means of evaluating this relationship. Given that the diversification performance (hence D-P) relationship is one of the most extensively studied relationships in the field of strategy, and is also a relationship that has been extensively studied in the fields of economics, accounting and finance, the informed reader may well ask, why is this most mature of research streams worth a further or renewed effort. Don't we know everything that is to be known about this relationship already?

Our response to this extremely legitimate question is as follows. It is indeed true that we know a lot about this relationship, and its many nuances. Most importantly, research - taken cumulatively -suggests that there is a non-linear relationship between diversification and performance, with performance increasing with diversification up to a point and declining as diversification increases beyond a point (see the comprehensive meta-analysis by Palich, Cardinal and Miller (2000) that substantiates this broad relationship using studies from both strategy and finance literatures and using both market and accounting performance measures). Indeed the efforts of the prior literature have uncovered a wealth of nuance on this relationship, as we highlight below.

However, even armed with this knowledge, three sets of reasons arise that suggest that unpacking this relationship further and in a novel way may be very effective for advancing knowledge.

First, it may be very helpful to build a finer-grained understanding of this relationship from the perspective of informing managers. Using aggregative measures, past work provides

insight into the D-P relationship; however, even with the progress made so far, this aggregation makes providing clean answers or practical advice to managers difficult, due to the complex nature of the underlying constructs of diversification and performance (and of the theoretical linkages between them). This "aggregation" issue can be seen to have several distinct dimensions:

a) Diversification is a multifaceted construct. For instance, firms could be relatedly diversified in technology but not in markets. Correctly identifying a firm as relatedly or unrelatedly diversified to advise managers may not be straightforward.

b) Performance is a multi-faceted construct as well (Miller, Washburn & Glick, 2013), with potentially many different aspects not necessarily strongly correlated with each other. Market share, growth, risk-adjusted returns, return on assets, equity, sales, new product introduction: the strategist and the manager are both interested in a variety of outcome measures. Diversification may affect these outcomes in different ways and with different temporal latencies.

c) Diversification is driven by many different theoretical motivations and models (e.g. see Palich, Cardinal & Miller, 2000). Each theoretical perspective driving diversification may itself be enacted through a variety of different mechanisms, and these mechanisms may entail both benefits and costs created through diversification. For instance, economies of scope created by sharing a distribution system across product lines may have to be balanced with the increased complexity and coordination costs created by the same sharing of assets. Deriving the implications of these complex trade-offs for practice is not obvious.

From a managerial perspective it would be helpful to have a clear outline of the multiple, distinct trade-offs along the above dimensions that are embodied in a diversification decision. However, to accomplish that in the context of the multiple mechanisms, multiple theoretical

logics, and multiple performance and diversification dimensions it would be helpful to conduct a more micro-analytic examination of D-P linkages. Unpacking the D-P relationship is thus the first motivation for renewed research.

Second, the problem of contextual validity is an additional reason for renewed research in this area. The extended literature on the D-P relationship has been conducted on a pre-internet business era and has largely focused on Western or developed institutional contexts. Both of these contextual "givens" that frame our current understanding of the D-P relationship, may not be completely valid in the world in which this relationship will be applied in the years to come. The dramatic development of information and communication technologies is likely to have significantly influenced the trade-off between the costs of organizing an activity inside the corporation and the costs of organizing the same activity outside the corporation. Thus, it suggests that the optimal scope of the firm may have changed in systematic (but hitherto unknown) ways in the post-internet era, another motivation for re-examining the D-P relationship.

Moreover, an increasing share of global corporate activity and value-creation is today conducted through firms from emerging markets that come from a very different institutional milieu. For instance, while in 2000 only 21 of the Global Fortune 500 were headquartered in emerging markets, 132 were so headquartered by 2014 (Carroll, Bloomfield & Maher, 2014). Just as technology can modify the appropriate horizontal and vertical boundaries of the firm so can institutions (Khanna & Palepu, 1997; North, 1990) as they influence the costs of organizing between and within firms. Note that in this setting we are referring not to the internationalization of a given firm or a firms' geographic boundaries; rather we are focusing on how the appropriate level of product-market diversification may be different in different

geographic contexts as they may imply different institutional regimes.[1] Given that our research needs to be applicable to this increasingly important context of less developed institutional milieus, examining the robustness of observed relationships in these institutional contexts is important.

A third reason to revisit the D-P relationship comes from the issue of establishing causality in the relationship. Although establishing causal relationships has always been the gold standard of science, new techniques and a greater emphasis on stronger tests before making causal claims has energized the strategy literature. In the context of the D-P relationship there has been a long-standing debate about the relative importance of selection and treatment effects going back to Rumelt's (1974) "escape hypothesis" - according to which firms may be seeking diversification to escape their poor industries or poor performance. The advent of a variety of new techniques that allow quasi-experimental research designs provides an opportunity to revisit this question with new and different approaches.

Our goal in this paper is to review the prior research to illuminate the dimensions of the problem uncovered by this past work and use the progress so far to suggest a complementary research approach to attack this question. In this process we hope to enthuse scholars to build on this most critical question, which still remains significant in its theoretical and practical import. The past research has provided a strong foundation for these efforts by identifying some of the core factors and conditions that are relevant to understanding and interpreting this relationship, as we will elaborate later in the paper. However, to unpack this relationship further and make it more transparent we argue that an additional fine-grained attack on the fundamental mechanisms that connect diversification to performance would be a useful complement to the already and ongoing research efforts with coarser but big picture variables.

[1] The question of appropriate levels of geographic diversification is not one that we address in this paper but the interested reader is directed to the very complete review provided by Cardinal, Miller and Palich, 2011.

Identifying and evaluating such mechanisms in terms of their attendant benefits and costs would highlight the trade-offs in a given diversification decision more clearly, and thus enable managers to make better decisions. Further, clarity at the level of the mechanism may also help address the other two issues raised above – the implications of variations in the institutional context of diversification and the issue of causal direction as we outline in more detail later in the paper.

In the sections that follow we explore the available research evidence on the D-P relationship. We conclude that:

a) although examination of the D-P relationship has been frequent, findings across individual studies have often been inconsistent - though the pattern of results taken together suggest a curvilinear relationship between diversification and performance as outlined earlier (see Palich et al. 2000);

b) the reasons for which diversification is conducted are very varied and often not consistent with each other (which could partly explain the above mentioned inconsistency across the results of individual studies);

c) any type of diversification move entails not just synergies but also significant costs and, hence, the net benefit of any diversification move is likely to be contingent on the relative balance between these benefits and costs;

d) while past research has examined the issue of benefits and costs, it has not very systematically identified, classified, and measured the costs arising from diversification or very tightly examined the specific mechanisms through which diversification creates value;

e) performance and diversification are both complex phenomena and the different motives for diversification may confer their benefits and impose their costs on different outcome variables (thus suggesting that a single-variable outcome study may not capture the net effects of both benefits and costs).

The previous five sub-propositions suggest that a more focused attack on understanding the D-P link may be beneficial. Specifically, we outline a mechanism-based approach that will be helpful in building a better understanding of the benefits and costs associated with broadening or narrowing firm scope.

The paper is structured in three core sections. In the next section, "*Reviewing Research on Diversification***",** we provide a detailed overview of existing research on diversification in the form of three sub-sections - the first, reviewing research on the impact of diversification on performance; the second, reviewing the literature that has examined the contingencies that affect the diversification-performance relationship; the third, reviewing studies that emphasize the methodological concerns that are relevant in interpreting the diversification-performance relationship. In the subsequent section, *"Revitalizing Research On Diversification: A Mechanisms-Based Perspective"*, we draw upon existing research to outline a new mechanism-based approach to the investigation of this topic that aims to revitalize research in this critical domain of strategy. We explain the foundations of the new approach and outline the sources of new energy in the study of diversification, which make this new approach particularly timely now. The result of our analysis is a general scheme that we depict in Figure 1 and corresponding Tables 1 through 5.

In the final section *"Conclusions and Future Research Directions",* we build on these analyses to outline a set of directions for future research.

INSERT FIGURE 1 HERE

Reviewing Research on Diversification

The Relevance of the Diversification-Performance Relationship

Any review of the D-P relationship may be well served by first asking: "why does this relationship matter?" If there is clarity on the reasons why the relationship matters, then these very reasons should provide guidance in directing research efforts. In the context of the diversification-performance relationship, understanding whether and how diversification affects performance is important because diversification is one of the most common decisions made by firms and entails significant corporate resources. Evaluating how effectively these resources are utilized and identifying the conditions under which diversification enhances economic performance is then critical. Addressing this objective would suggest that one goal of diversification research should be to provide guidance for resource allocation decisions in the context of firm scope. Broad rules of guidance - such as whether related/unrelated diversification is generally beneficial for financial performance - are useful from this perspective. However, given the complexities identified earlier in defining omnibus constructs such as diversification and performance, establishing clarity on the key contingencies and trade-offs that different types of diversification moves entail and providing a framework that can assist in specific decisions is another desirable goal.

Relatedly, we note that diversification is pursued by different firms for different reasons. Results from studies aggregating *across* these motivations are helpful, but from the standpoint of the individual manager making a decision, providing insight into the trade-offs that she is likely to confront in the context of her own specific motivation for a given diversification move would be helpful as well. Under these conditions, identifying the benefits and costs associated with each motivation for diversification is a useful exercise. This logic underlines our call for a focus on mechanisms.

Methodology

In the sections that follow we explore the available research evidence on the D-P relationship. In order to identify the research to include in this review, we began by selecting a sample of world renowned journals for their impact and publication quality in the domains of management (Academy of Management Journal, Academy of Management Review, Administrative Science Quarterly, Management Science, Organization Science, Strategic Management Journal); finance (Journal of Finance, Journal of Financial Economics, Review of Financial Studies); economics (American Economic Review, Quarterly Journal of Economics, Journal of Political Economy, Rand Journal of Economics) and accounting (Journal of Accounting Research, Journal of Accounting and Economics, Accounting Review).

We were interested in identifying all articles published in these journals studying the diversification performance relationship. To this purpose, we used Business Source Complete to identify all articles in the above mentioned journals that, either in the title, abstract or keywords reported the word "diversification" and at least one word referring to performance[2]. These criteria led us to identify 440 articles. We read the abstracts of all the articles to identify the papers that were actually studying the D-P relationship and we excluded all articles studying other relationships or using these terms as general labels. In some cases reading the abstract to determine whether the specific article should or should not be included in the sample was not sufficient; hence, we read the full article. We excluded from the sample the papers focusing on international diversification as well, since the set of mechanisms relating international diversification to firm performance are largely not overlapping with those affecting firm diversification (for a recent comprehensive review of research in this area, please refer to Cardinal, Miller and Palich, 2011). This led us to select 154 articles. Finally, we added

[2] To identify the set of different words used in management, finance, economics and accounting to refer to firm performance in connection with diversification, we conducted a pilot search in which we identified thirty core articles across disciplines focusing on the D-P relationship and used them to identify a set of recurring keywords referring to performance. The list of words identified included: value, performance, profit, sales, premium, discount, Tobin, valuation, risk, innovation, return, ROA, ROE, ROS, ROI, Jensen, Treynor, Sharpe, share, earning, corporate social responsibility (CSR).

to this selection papers that were cited in the selected articles or papers of which we had previous knowledge.

While we are aware of the fact that this selection is certainly not exhaustive, we believe that the selection criteria chosen ensure it is reasonably representative of the research conducted so far in the field. Although the focus of this article is on the D-P relationship, understanding the theoretical motivations underlying diversification may itself be useful to interpret the D-P relationship. Accordingly, to supplement our main set of collected articles we also reviewed the broader literature on diversification to identify the various theoretical motivations for diversification and the mechanisms implicit in each motive that could link diversification with performance. Since this was not the primary focus of this article we did not however review all articles of this type as that would have entailed a much larger scope than this article was intended to cover. The goal of this component of the study was to identify the main motivations underlying diversification rather than provide an exhaustive survey of that topic.

Diversification and Firm Performance

The most common approach to studying the diversification-performance link has been to look at diversification and evaluate its impact on measures of performance. Studying this relationship has been an extremely fecund endeavor with literally dozens of studies having focused on this issue.

The first issue that arises in this setting is the meaning and definition of firm performance. In a very thoughtful article Miller, Washburn and Glick (2013) highlight that firm performance can be approached conceptually in at least three different ways: a) as a latent construct that is reflected in the shared variance of multiple correlated variables (p. 951), b) as a domain of separate constructs, that does not exist as a meaningful general construct (p. 952), and c) as an aggregate construct with multiple components that can be reconciled and aggregated (p. 952).

Inconsistency in the approach to conceptualizing performance between theorizing and testing (for instance theorizing about a latent construct but testing an aggregate construct) leads to difficulties of interpretation and knowledge accumulation.

In the current context their argument would suggest that rather than seek a single overarching D-P relationship, for interpretation and accumulation of knowledge it would be useful to consider the effect of diversification on individual constructs that span the domain of firm performance, rather than as a single latent construct or single aggregate construct. We believe this to be so for two reasons. First, as they note, the different measures of performance are not very highly correlated among themselves; in their study across 290 articles "there were no persuasive instances of authors finding enough shared variance among non-perceptual measures to form a latent performance variable". This seems to favor ruling out the first approach – the latent construct approach. Further, the aggregate construct approach would require reconciling the different potential measures and then aggregating across them. This in turn would require the researcher to have an understanding of how the different measures relate to each other and can substitute for each other in some additive or multiplicative fashion. Given the current state of management research such an understanding is not on the horizon. How revenue growth relates to market share and stock performance cannot be easily captured in some algebraic expression that could be applied across all studies.

A second argument for focusing on the individual constructs approach comes from the very varied nature of the mechanisms that underlie the diversification-performance link. As we shall detail in a section below, diversification is undertaken for different theoretical reasons and -within and across the various theoretical inducements for diversification- a variety of different mechanisms affecting performance emerge, affecting different performance outcomes in different ways. From the perspective of providing guidance and clear research conceptualization and interpretation, together these arguments suggest that examining the

effects of diversification on a variety of different outcome variables would be of value. Accordingly, in our review we distinguish between the different dimensions of performance and evaluate the effect of diversification on each separate dimension. A classification of the studies investigating the impact of diversification on different performance measures is reported in Table 1.

Diversification and accounting measures of performance. The field of strategic management has studied the connection between diversification and accounting measures of performance particularly closely. Relevant management work in this area can be dated back to the seminal work of Wrigley (1970) and Rumelt (1974). Building upon Wrigley (1970), Rumelt defined a classification based on four major categories (i.e. single business, dominant business, related business and unrelated business) to create a typology of firms' diversification patterns. In contrast with the earlier industrial organization literature that reported a non-significant relationship between diversification and performance (e.g. Arnould, 1969; Gort, 1962; Markham, 1973), Rumelt's results showed a positive association between diversification strategy and profitability (return on capital and return on equity) and a variety of additional performance measures including growth in earnings, and standard deviation in earnings per share. Broadly speaking, he found support that related diversification outperformed unrelated, with dominant-constrained and related-constrained categories outperforming other categories. This positive result generated substantial interest in subsequent research but was soon challenged by conflicting results. While some studies confirmed a positive association between diversification and performance, they challenged the superiority of the related diversification strategy over the unrelated diversification strategy (Bettis, 1981; Bettis & Hall, 1982; Christensen & Montgomery, 1981; Palepu, 1985). In attempting to resolve this basic conflict, subsequent research followed several different paths. Although researchers continued to

address the basic relationship, they also focused on a variety of different possibilities, such as the relationship being contingent on other variables, possible selection issues, omitted variables, etc. For instance, researchers considered the possibility that performance differences might themselves be related to industry effects (e.g. Rumelt, 1974; Bettis & Hall, 1982; Lecraw, 1984; Park, 2003) or market structure (Christensen and Montgomery, 1981) or that the relationship might be fundamentally endogenous (e.g. Rumelt, 1982; Dubofski & Varadarajan, 1987; Park, 2003). We briefly review the key attempts along these various vectors as scholars sought to reconcile prior conflicting results in subsequent separate sub-sections; however, in this sub-section - for continuity - we focus largely on the studies that used accounting measures of profitability trying to address the basic question.

Multiple studies focused on addressing the observed conflicting results of prior work on the basic D-P relationship reaching contrasting conclusions themselves. Several studies found no significant performance difference between firms with differing levels of diversification (e.g. Dubofsky & Varadarajan, 1987; Johnson & Thomas 1987; Keats & Hitt, 1988), others found that diversified firms outperformed focused firms but there was no difference between the performance of related and unrelated diversifiers (Grant & Jammine, 1988) and yet, others found that diversified firms had lower profits than undiversified firms (Amit & Livnat, 1988). In another twist, scholars identified variations across accounting performance measures with Simmonds (1990) finding a positive effect of relatedness on Return on Assets (ROA) but not Return on Equity (ROE), or Return on Invested Capital (ROIC). Hence, at the turn of the millennium - after almost three decades of research - the debate on the effect of diversification on performance was not resolved, though evidence was adding up on both sides (Palich, Cardinal & Miller, 2000).

Adopting a novel take on the problem, in perhaps the most comprehensive study of the issue, Palich and colleagues used a meta-analytic approach on a sample of 55 studies (Palich,

Cardinal & Miller, 2000) finding that, on the basis of accounting performance measures (growth and profitability), a curvilinear relationship best summarized the data, with related diversifiers outperforming both focused firms and unrelated diversifiers. A study by Mayer and Whittington (2003), shortly thereafter, also provided some supporting evidence for related constrained diversifiers outperforming the other Rumelt categories.

Diversification and market-based measures of performance. Departing from strategic management research that focused mainly on accounting measures of performance, some scholars in the mid-80s started to investigate the connection between diversification and market-based measures of performance. A first set of scholars in these areas investigated the relationship between diversification and risk-adjusted-return measures. Dubofsky and Varadarajan, (1987), replicating an earlier study (Michel & Shaked, 1984) find evidence that when risk-adjusted-market-based measures of performance are taken into account - i.e. Sharpe's (1996); Treynor's (1965) levered and unlevered measures, Jensen's (1968) alpha - unrelated diversifiers are better performers than related diversifiers, a result contrasted by subsequent studies. For example, Lubatkin and Rogers (1989) show that firms diversifying in a constrained manner demonstrate significantly higher levels of risk-adjusted returns and significantly lower levels of risk. One possible explanation posited for this conflict is the different historical period analyzed by the two studies (e.g. 1950-1970s for Lubatkin and Rogers (1989) versus 1975-1981 for Dubofsky and Varadarajan, (1987).

A second set of scholars, instead, investigated the relationship between diversification and excess value, in order to understand whether the market associates diversified firms with a premium or a discount relative to collections of standalone businesses in the same industries. Montgomery and Wernerfelt (1988) focused on diversification using a competitive advantage logic and theorized that the further firms diversify from their current scope, the more they

diversify away from efficiency and from their area of competitive advantage. As a result, diversification should reduce the rents for such firms. In line with this prediction, they found that a higher level of diversification is associated with a lower Tobin's q. Evidence of a "diversification discount" has also been found by other scholars, often in the finance literature. For example, Lang and Stulz (1994), show a negative relationship between firm diversification and Tobin's q throughout the 1980s. Further investigation of the mechanism behind this phenomenon led the authors to conclude that the effect might have been caused by industry effects; in fact, rather than interpreting the result as an indication of the fact that diversification might hurt performance, the authors note that more diversified firms in the sample appeared to perform poorly before becoming diversified, advancing the very relevant insight – that was subsequently picked up by further research - that the diversification discount might be explained by endogeneity.

Berger and Ofek (1995) compared the sum of the stand-alone values for the individual business segments in which the firm is present to the actual firm value, identifying a value loss between 13% and 15% for diversifying firms, which becomes smaller when the segments of the diversified firm are in the same two-digit SIC code. Soon thereafter, looking at the period from 1961 to 1976 (i.e. the period in which a high diversification trend was observed in the market) Servaes (1996) found no evidence that diversified companies were valued at a premium over single-segment firms. Instead, he identified a diversification discount that declined to zero during the 1970s. Studies also identified several mechanisms to which this diversification discount could be attributed: a) capital misallocation in terms of cross-subsidization of bad businesses by good businesses in diversified firms (Scharfstein, 1998; Shin & Stulz 1998; Rajan, Servaes & Zingales, 2000), b) agency problems unchecked by poor governance structures (Anderson, Bizjak, Lemmon, & Bates, 1998; Palia, 1999), c) industry specific productivity that does not transfer across industry borders as a firm diversifies

(Maksimovic & Phillips, 2002). However, in contrast to some of the above studies, Denis, Denis and Sarin (1997) found limited evidence of value loss for diversified firms. One issue that makes reconciliation of these studies difficult is that, while the strategy literature has commonly distinguished between related and unrelated diversification, such a distinction has not always been made in the finance literature.

In their comprehensive meta-analytic study mentioned earlier, Palich et al. (2000) also looked at the effect of diversification on market measures (risk-adjusted returns and unadjusted market value) of performance. They found support for the inverted-U relationship as in the accounting-measures-based studies. However, several of the market-measure-based studies in the sample underlying the meta-analysis did not provide enough information to assess the results as completely as was possible with the accounting measures. A set of subsequent studies have argued for methodological concerns as an explanation for the recorded diversification discount (Campa & Kedia, 2002; Gomes & Livdan, 2004). We reflect on those later in the paper, when we examine the methodological issues identified by scholars that make studying this question difficult.

Diversification and "other" performance outcomes. In addition to looking at accounting and market measures of firm performance, prior research has also investigated other firm outcomes such as growth and innovation. The argument for examining these emerges from the recognition that changes in firm scope could influence many of these outcomes as well.

Growth. Early studies found evidence that conglomerate firms were growing much faster than other firms on many performance dimensions (Weston & Mansinghka, 1971). Subsequently though, Palepu (1985) did not observe any significant cross-sectional variation in profitability between diversifying and non-diversifying firms, nor between firms engaging in related versus unrelated diversification. However, his study showed that firms with

predominantly related diversification display significantly better profit growth than firms with predominantly unrelated diversification. A recent result in this domain is provided by Levinthal and Wu (2010) who highlight the importance of recognizing that firms seek to maximize total profit growth- not profit margins or Tobin's Q, the two most commonly used measures in research. As they show, a given diversification move can increase total profits and be rational for a company facing a mature market, but would result in lower average profit margin and Tobin's Q. In the context of intra-industry diversification, Zahavi and Lavie (2013) show the existence of a U-shaped relationship between product diversity and sales growth, due to the fact that growth is initially limited by the effect of negative transfer effects, which are eventually attenuated by economies of scope, an effect that becomes more pronounced with the intensity of technological investment and which gets attenuated by firms' accumulated intra-industry diversification experience.

Research and development (R&D) and innovation. A fairly prolific stream of research has emerged on the impact of diversification on R&D intensive firms and in particular on their innovative performance. The literature has looked at both the effect of diversification on the incentives to conduct research as well as the outcomes achieved, conditional on having conducted research in a diversified firm. The literature on diversification and innovation has been addressed in another Annals article (Ahuja, Lampert & Tandon, 2008) so we do not comprehensively review it here, except to note the key takeaways.

Although early literature highlighted the incentive-enhancement effects of diversification - in that a diversified firm could afford to invest in R&D given the uncertainty of research, because its broader scope permits a higher likelihood of being able to utilize the results (Nelson, 1959)- more recent literature has argued for a more complex and nuanced view. In particular, the received work suggests that diversification may have distinctive effects on innovative

effort, innovative productivity, the commercial potential of inventions, and even the direction of technological efforts.

From an incentives-to-conduct-research perspective, Hoskisson and Hitt (1988) argue that the tight financial control that characterizes M-form, large, diversified firms tends to induce these firms to engage in a risk-minimizing and short-term-oriented decision making process, and hence, reduces investment in R&D. In line with this prediction, the study finds that U-form firms that are less diversified tend to have a higher R&D investment compared to more diversified M-form firms. However, subsequent research also suggests that – despite the change in incentives associated with diversification – firms are able to adapt their structure in order to foster risk-taking at the divisional level (Cardinal & Opler, 1995). Consistent with this, Cardinal and Opler (1995) do not find any statistical significant effect of diversification on the number of new products introduced per dollar by a sample of firms active in research.

From the innovative productivity perspective, research emphasizes the opportunity for resource sharing and cross-fertilization offered by diversification (Miller, Fern & Cardinal, 2007; Wu, 2013). Mirroring the inverted U relationship between diversification and financial performance, but for different reasons, Ahuja and Katila (2001) find that moderate degrees of technological overlap between acquiring and acquired firms are associated with the greatest post-merger innovative productivity. The use of interdivisional knowledge tends to be associated with a greater positive impact of invention on subsequent technological developments than the impact of knowledge originated either inside the division or outside the boundaries of the firm (Miller, Fern & Cardinal, 2007). In other words inventions spawned by knowledge recombination across divisions tend to be most impactful in determining the trajectory of subsequent technical changes. In line with this, Cardinal (2001) shows that knowledge diversity, and in particular scientific diversity, is critical to drug research and facilitates the creation of new knowledge via cross-fertilization, leading to innovation. Cardinal

and Hatfield (2000) show that diversification influences the productivity of research centers for firms, with focused firms benefitting more from setting up research centers than diversified firms. In line with the idea that diversification affects innovation by changing firms' opportunities to access resources, Kim, Arthurs, Sahaym and Cullen, (2013) recognize the importance of the fit between the type of diversification and the technological search strategy conducted by the firm. Their results show that a related diversification strategy tends to lead to greater innovation when firms use a narrow technological search strategy; however a broader technological search strategy is associated with superior performance in the context of unrelated diversification.

Diversification can also influence the commercial potential that firms are able to create for their inventions. Novelli (2015) shows that diversified knowledge in firms' knowledge bases is associated with the identification of a higher number of variations to their inventions and of opportunities to apply those inventions (as reflected by patent claims); however, as relatedness increases, the opportunities identified tend to be concentrated in specific areas as opposed to being spread across multiple technological domains. An association between the latter outcome and firms' superior ability to appropriate the returns from their inventions is subsequently identified (Novelli, 2015). Wu (2013) shows that resource sharing tends to lead to higher innovative performance at the corporate level than at the individual division level.

Another study suggests that it may be worthwhile to consider the effects of diversification-type (related or unrelated) on the direction of innovation (Ahuja, Lampert & Tandon, 2013). Studying the reactions of firms to the oil price shock of 1980 this study finds that unrelated diversifiers chose to invest in paradigmatic (or established) technologies while related diversifiers were more willing to invest in paradigm-changing or nascent technologies, a tendency the authors attribute to differing decision-making mechanisms in the two types of companies. Summarizing across the above studies we note that the received literature suggests

multiple complex effects of diversification on innovation, rather than an unambiguous simple directional effect.

Survival. Firm survival is another performance dimension investigated by some studies. Mitchell and Singh (1993) find that incumbents that expand into new subfields survive longer than incumbents who don't. Stern and Henderson (2004) find that the relationship between diversification and survival is conditional, i.e. it depends on the amount of environmental change created by the dynamic of other firms in the industry innovating and diversifying. However, Lange, Boivie and Henderson (2009) suggest that established firms diversifying into a new industry tend to generate subsidiaries that are weaker survivors than independent startups, suggesting that corporate parents tend to hinder the survival of their own offspring. These results once again are indicative of the complexity of the relationship between diversification and firm performance.

Riskiness. The relationship between diversification and risk is not straightforward. Building on the intuition from financial economics that diversification (in particular unrelated diversification) could be associated with risk reduction, some studies have investigated the relationship between diversification and risk; however their results have often conflicted. On the one hand, unrelated diversification that combines businesses with different structural characteristics, could in principle lead to a stabilization of earnings (e.g. Bettis & Hall, 1982). However, Bettis and Hall (1982) find no evidence of a significant relationship between diversification and earnings volatility (measured as the standard deviation of ROA).

A second possible manifestation of this benefit would be the "co-insurance" effect. Since diversified firms may face a reduction in the probability of bankruptcy and their unrelated businesses provide additional collateral, unrelated diversifiers may be able to either carry more debt or realize a lower rate on the debt they carry (Lewellen, 1971). Although some finance research has found support for this, in that conglomerates were found to have higher debt than

non-conglomerates (Melicher & Rush, 1974), the overall takeaway is not as clear. For instance, Montgomery and Singh (1984) showed that the systematic risk of unrelated diversifiers is significantly higher than that of the market portfolio, possibly because unrelated diversifiers carry higher debt and may have lower market power than focused firms. Hence, while unrelated diversification may reduce idiosyncratic risk, it may be resulting in higher systematic risk on account of the higher debt being carried.

Other studies too have provided mixed results. Studying related and unrelated mergers, Amit and Livnat (1988) use a measure that takes the underlying economic attributes as well as the impact on the business cycle explicitly into account and find that pure financial diversification is associated with a reduction in risk and with an increase in leverage. Lubatkin and O'Neill (1987) find that, while all kind of mergers tend to increase the level of unsystematic risk, related mergers significantly reduce the level of systematic and total risk. Barton (1988) too finds that unrelated diversification is associated with a higher level of systematic risk. However, in a subsequent study on mergers, by controlling for the systematic risk of the target firm and correcting for potential heteroskedasticity, Chatterjee and Lubatkin (1990) found that related mergers induced a downwards shift in the systematic risk for related bidders; unrelated mergers appear to be effective at reducing stockholders risk. In general this stream in the literature has raised several interesting possibilities but defies a conclusive takeaway – potentially making it ripe for further work.

Considerations and Implications for Future Research. One way of integrating this research on the impact of diversification on different types of outcomes is to consider them as intermediate outcomes between diversification and value-creation. For instance, diversification affecting innovation or higher growth could in turn be reflected in subsequent value creation, for instance through better products or processes that enhance profit, or in the case of growth,

that lead to a higher earnings multiple. Yet, even this brief survey should have indicated that the underlying relationships between diversification and such intermediate outcomes are quite complex. For instance, diversification affects innovation levels, type, locus (center versus division), and is moderated by organizational structure and search strategy among other factors. In summary, our conclusion from the review of the D-P literature so far suggests that the underlying relationships are quite complex from the perspective of managers seeking guidance.

INSERT TABLE 1 HERE

The Contingencies Affecting the Diversification-Performance Relationship

A second strand exploring the diversification–performance linkage, with a view to reconciling the conflicting findings of the original work on the D-P relationship, focused on the role of moderators possibly affecting the relationship. In this phase researchers started acknowledging that the relationship between diversification and performance is more nuanced and that it is not univocal but rather contingent: diversification can have different effects on organizational performance depending on the presence of some factors that moderate the relationship. What is interesting about this stream of literature is that it starts focusing attention on the underlying mechanisms that relate diversification and performance. A classification of the studies within this research set is reported in Table 2. This research identified three main classes of contingencies: (1) characteristics of the industry/ market in which a firm operates and the businesses into which a firm diversifies; (2) characteristics of the diversifying firms; (3) characteristics of the diversification move.

Characteristics of the Industry/Market in which Firms Operate or Diversify. A first set of studies has emphasized that the relationship between diversification and performance is contingent on the characteristics of the industry/ market in which a firm operates and the

businesses in which a firm diversifies. For instance, some studies emphasize that a diversification strategy may be more valuable under certain economic (e.g. Kuppuswamy & Villalonga, 2016; Lubatkin & Chatterjee, 1991; Wernerfelt & Montgomery, 1986) or industrial conditions (Davis & Thomas, 1993; Mitchell & Singh, 1993). For instance, Santalo' and Becerra (2008) argued and presented evidence that the effects of diversification would differ across different industries. In their theory, industries differ in the importance of hard versus soft information with the latter being difficult to communicate across firm boundaries. In industries where soft information is pervasive, diversifiers might have a funding advantage as they can access resources more easily (from the corporate center through cross-subsidization) than firms that are focused, which must instead access the capital markets wherein they may have difficulty communicating soft information. They also posit a second possible mechanism: industries that deal with only a few players in an upstream or downstream industry would be more at risk of hold up; hence, vertically integrated firms in these industries could post a superior performance relative to focused firms. Consistent with their arguments, they find that there is a diversification discount in industries in which specialized firms enjoy a large market share while there is evidence of a diversification premium in industries in which diversified firms enjoy a large market, suggesting that industry characteristics are critical in determining whether the diversification-performance relationship is positive or not.

Another set of contingencies that the literature has identified relates to the differential ability of diversified and focused firms to raise external capital in certain contexts. The basic line of reasoning is that diversified firms may have higher debt capacity due to the already-mentioned co-insurance effect (Lewellen, 1971) and that whenever there is a financing constraint (e.g. in a crisis) this debt capacity can enable them to stay closer to their optimal debt levels whereas focused firms may be unable to achieve them (Dimitrov & Tice, 2006; Kuppuswamy & Villalonga, 2016). More broadly this argument can be extended to other

contexts wherein there are capital market inefficiencies, such as emerging markets, wherein diversified business groups can raise capital more easily (Khanna & Palepu, 2000), or in cyclical industries where capital sufficiency may vary significantly over the business cycle (Erdorf et al. 2013). Klein (2001) found that the level of the diversification discount varies over the years: while conglomerate were good performers in the 1960s, their performance declined in the 1970s. These authors suggest the possibility that the performance of diversified firms, especially unrelated ones, might depend on the relative efficiency of internal versus external capital markets over time. Another interesting insight emphasized by research in this stream concerns the fact that the performance of diversified firms is contingent on the characteristics of their rivals such as the rivals' own diversification strategy (Anjos & Fracassi, 2015; Li & Greenwood, 2004; Santalo' & Becerra, 2008) or the environmental change created by the innovation and diversification dynamics of other firms in the industry (Stern & Henderson, 2004).

Characteristics of Firms. A second set of studies emphasizes that the relationship between diversification and performance is contingent on the characteristics of firms and in particular the internal arrangements that enable firms to actually take advantage of the benefits of diversification. Some studies acknowledge that the underlying level of diversity across businesses increases the complexity in managing a diversified corporation and exploiting the benefits of this strategy, with a depressing effect on performance (Capon et al. 1988; Harrison, Hall & Nargundkar, 1993; Markides & Williamson, 1994; Rajan, Servaes & Zingales, 2000). On the other hand, some studies find than when specific types of corporate diversity are taken into account (e.g. technological diversity, Miller, 2006) a positive relationship between diversification and Tobin's q emerges.

Within this stream of research, a group of studies focuses on the importance of organizational structure in determining the success of diversification by reducing the costs of

transactions across different businesses and giving firms the possibility of sharing resources across businesses, leading to the realization of synergies (e.g. Cardinal & Hatfield, 2000; Chang & Choi, 1988; Hill, Hitt & Hoskisson, 1992; Hoskisson, Harrison & Dubofsky, 1991; Hoskisson, Hill & Hitt, 1991; Klein & Saidenberg, 2010; Markides & Williamson, 1996). Building upon Chandler's seminal work (1962), scholars recognized that diversified firms have often shown a tendency to adopt multidivisional organizational structures assigning responsibilities for different businesses to autonomous divisions. Scholars have investigated the association between the structure chosen and the type of diversification selected. The results are consistent with the idea that the M-form of implementation tends to decrease the rate of return and the market evaluation for related diversifiers and increase the rate of return for unrelated diversifiers (Hill & Hoskisson, 1987; Hoskisson, 1987; Hoskisson & Hitt, 1988). Hence, failing to adopt the right organizational structure could lead to underperformance.

In the same fashion, organizational arrangements such as compensation policies and managerial incentives can affect the implementation of diversification and, in this way, determine its success (e.g. Aggarwal & Samwick, 2003; Gomez-Mejia, 1992; Gary, 2005). Building on the same underlying logic that the way in which diversification is actually implemented within firms and the extent to which its potential is effectively realized in the implementation exert a key role in determining performance, some studies have found that the level of firms' investment in Information Technology (IT) plays an important role in determining their performance (Chari, Devaraj & David, 2008; Ray, Xue, & Barney, 2013). Other firm-level contingencies that are relevant in determining the performance effects of diversification are the actual search strategy used by the firm (Kim et al. 2013), the stage of the firm life cycle (Arikan & Stulz, 2016), the extent of disclosure (e.g. Bens & Monahan, 2004; Franco, Urcan & Vasvari, 2016 - due to the fact that disclosure plays a monitoring role in disciplining management's investment decisions), the level of debt (O'Brien et al. 2014).

Characteristics of the Diversification Move. Finally, a third set of contingencies that have been identified by prior research as moderating the relationship between diversification and performance are the characteristics of the diversification approach itself, such as the diversification mode (e.g. Busija, O'Neill & Zeithaml, 1997; Lamont & Anderson, 1985; Simmonds, 1990), the motive (e.g. Anand & Singh, 1997; Hill & Hansen, 1991) and the actual level and type of synergies that are realized through the move itself (e.g. Barroso & Giarratana, 2013; Chang, 1996; Davis et al. 1992; Ilinitch & Zeithaml, 1995; Tanriverdi & Lee, 2008; Tanriverdi & Venkataraman, 2005). Once again, the implicit theme brought forward by this stream of research is that it is not the fact of diversifying itself that leads to a superior performance but the extent to which the context (at the business- firm or diversification move level) provides the opportunity to activate a set of value-creating mechanisms.

Considerations and Implications for Future Research. The abiding picture that emerges from this section of the review is that the relationship between diversification and performance is an extremely nuanced one; although knowing the main effect is helpful, for managers to fully utilize this information in making decisions probably more fine grained trade-offs need to be highlighted.

INSERT TABLE 2 HERE

The Methodological Concerns Affecting the Diversification-Performance Relationship

A third strand of research has attempted to reconcile the conflicting results by closely examining the specific methodological choices of the various studies in this area. A review of this prior research is relevant because it allows us to understand prior results, but also because it provides a review of the methodological advancements of research in this area and of the

various aspects that need to be taken into account by researchers that want to continue research in this domain. A classification and synthesis of the studies that contributed in this direction is reported in Table 3.

Measuring diversification. In the attempt to clarify the nature of the relationship between diversification and performance, an important debate concerns the measurement of firms' diversification strategy. Prominent among the issues is recognition of the "trade-off between finding a measure that guarantees richness of information versus one that ensures objectivity and replicability" in the measurement of diversification (e.g. Montgomery, 1982). In this respect, the earliest studies used SIC-based product count measures (e.g. Arnould, 1969; Gort, 1962; Markham, 1973) that allowed effort and time efficiency in calculation but where the different categories did not reflect the extent of relationship or distance between them. Such studies for the most part did not find evidence of a diversification-performance effect suggesting that perhaps the simple counting of product categories was too crude to accurately capture the underlying complexity of the ties between businesses.

Building on Wrigley's (1970) work, Rumelt (1974) built a somewhat more qualitative information-infused set of measures based on a two-tier breakdown of categories. In Rumelt's (and Wrigley's) approach, judgment was introduced into the measures by explicitly asking whether the individual businesses in a corporation were related to each other after an analysis of the company's history and the "logic" of the business's relationship with other businesses. As noted earlier, using these measures, Rumelt found support for the "relatedness helps performance" thesis. However, this measurement schema - while moving beyond the pure count of businesses approach- was both labor-intensive and introduced subjective assessment from the researcher.

In attempts to combine the benefits of both objectivity and richness of information, subsequent studies developed multiple diversification indexes including a Herfindahl index of diversification (Berry, 1974); a hierarchical classification system using 4 digits and 2 digits SIC codes to recognize related and unrelated diversification (Varadarajan & Ramanujam, 1987); the Jacquemin-Berry entropy measure (1979), accounting for the number of product segments in which the firm operates, the distribution of total sales across the product segment and the degree of relatedness among the various product segments; and the concentric index (Caves, 1980; Montgomery and Wernerfelt, 1988). In the attempt to improve measurement accuracy, multiple subsequent studies offered variations on these measures (e.g. Amit & Livnat, 1989; Davis & Duhaime, 1992; Davis & Thomas, 1993) and used them in different ways, such as calculating the measures based on line of business data versus segment data (e.g. Farjoun, 1994; Montgomery & Hariharan, 1991; Palepu, 1985); longitudinal versus cross sectional (Bergh, 1995); and different levels of analysis (Stimpert & Duhaime, 1997).

The validity of different measures has been assessed by several studies (e.g. see Chatterjee and Blocher, 1992; Hoskisson, Hitt, Johnson & Moesel, 1993; Lubatkin, Merchant & Srinivasan, 1993; Hall & St. John, 1994; Montgomery, 1982; Pitts and Hopkins, 1982; Robins & Wiersema, 2003 for extensive reviews and comparison), which overall suggest that - although the different measures are characterized by a good level of consistency- they tend to capture slightly different aspects of the phenomenon and should be used accordingly.

For example, Pitts and Hopkins (1982) suggest that whereas business count measures appear more suitable for research comparing diversified and non-diversified firms, they are less appropriate in explaining the difference among diversified firms. Hall and St. John (1994) show that categorical and continuous measures appear to be associated, but they seem to capture different aspects of the relationship between diversification and performance. Robins and Wiersema (2003) show that the related components of both concentric and entropy

measures can be sensitive to features of the corporate portfolio composition and can therefore create ambiguities. Due to these characteristics of these measures, it might be the case that those studies that have used these measures to capture a relationship between related diversification and performance may have actually picked up a relationship between pure diversification and performance (Robins & Wiersema, 2003).

Other measurement problems are inherent in using common data sources such as Compustat to operationalize diversification. For instance, some of the limitations identified in the use of these data relate to the fact that "individual" segments may actually already incorporate some diversification and that, further, the number of lines of business that firms can indicate in their Compustat profile is restricted to ten, limiting the extent to which diversification can be observed (Villalonga, 2004).

Another important issue in the measurement of the relationship between diversification and performance concerns the interpretation of the construct of "relatedness" itself. In fact, relatedness can refer to interdependencies between different businesses that can originate from many sources. For instance two businesses can be related in that they share common inputs (Ahuja, Lampert & Tandon, 2013), skills and capabilities (Farjoun, 1994; Mahoney & Pandian, 1992; Peteraf, 1993; Teece, 1977; 1982); technologies and knowledge (e.g., Miller, 2006; Robins & Wiersema, 1995; Silverman, 1999; Tanriverdi & Venkataraman, 2005); physical assets (Chatterjee & Wernerfelt, 1991; St. John & Harrison, 1999); distribution channels or product markets (Capron & Hulland, 1999).

Unfortunately, the correlations between these various sources of relatedness are far from perfect and likely to be variable across industries and over time. Moreover, industries are likely to differ in terms of which of these bases of relatedness are more meaningful in a given set of industries. These types of issues further complicate the interpretation of aggregate relationships, even nuanced ones, between diversification and performance. In some industries,

skill relatedness may be critical as all other resources available for conducting the business may be easily available; in other cases common distribution channels may be key to synergy benefits while products to be put through the distribution channels can be sourced very easily. The inability to establish a standard definition of relatedness over space and time makes interpreting and using a broad D-P relationship challenging.

Measuring performance. We note that some studies have also emphasized that the measurement of performance itself can affect results. For example, Bergh (1995) shows that diversification is positively related to performance when data are pooled, averaged and tested cross-sectionally; while different association patterns are identified when relationships are tested over time. Whited (2001) points out that the different measures can be subject to measurement error and as such can generate distorted results. Whited (2001) builds on prior literature that identifies a diversification discount emerging from the inefficient allocation of capital expenditures across divisions within conglomerates. She suggests that these results may rather be caused by measurement error in q as well as in the correlation between investment opportunities and liquidity. Treating measurement error in q, the paper finds no evidence of inefficient allocation of investment.

An important issue on the measurement of performance concerns what metrics are more appropriate to use. Accounting metrics (e.g. ROA, ROE) and stock market metrics (e.g. Tobin's Q, stock market reaction to diversification moves) could both serve as measures of the performance effects of diversification and indeed a broad literature has developed using both types of measures, albeit with a difference in relative usage across fields: in finance, the focus is commonly on market measures, whereas strategy researchers more commonly use accounting measures.

The reliance on different performance measures might lead to different conclusions on the

diversification-performance relationship and, in particular, regarding the benefits of related versus unrelated diversification. For instance, as noted earlier, the benefits of unrelated diversification potentially include a "co-insurance effect" that may reduce the cost of capital (Lewellen 1971) as well as provide stability to cash flows (Bettis & Hall, 1982). Although the key synergy benefits of related diversification could be reflected in accounting performance measures such as average ROE, some of the benefits of unrelated diversification such as volatility reduction may not be captured by average ROE-type metrics. In fact, solely using such accounting measures may unfairly bias the findings towards demonstrating better performance for related diversifiers in this case. In contrast, market measures that capture expectations can, in the context of a reasonably efficient market, represent the wisdom of crowds. Therefore, market measures may be able to price in the benefits of volatility reduction as well as traditional synergies.

If market measures might be more comprehensive in their consideration of benefits and yield conclusions at odds with those reached through the accounting measures, then the discerning scholar might wonder if perhaps we need to look deeper at studies using purely accounting measures as they may suffer from the "effects- of- diversification-are-split-across-multiple-outcome-measures problem" and should rather prefer to use market-based measures to study diversification. However, market-based measures suffer from their own limitations. In addition to the issues of capital market efficiency (limitations that attend to all research conducted using market-based measures) in the context of research on diversification there is an additional limitation: diversified firms' stock valuations may be subject to social legitimacy and bounded rationality problems from the perspective of stock analysts. These may lead to a discounting of their stock prices relative to focused firms for cognitive rather than cash-flow reasons (Litov, Moreton & Zenger, 2012; Zuckerman, 1999).

Using a sociological lens, Zuckerman (1999) argued and found support for the idea that, when a firm is not covered by analysts who are experts in that firm's business, its stock price tends to be discounted – a phenomenon he describes as an "illegitimacy discount". In subsequent work Zuckerman (2000) argued and demonstrated that diversified firms indeed de-diversified if their pattern of diversification precluded their fitting into a coherent corporate identity that matched the analysts' expertise categories. Together these papers suggest that stock prices of unrelated diversifiers may be partially dampened due to lack of appropriate coverage by analysts. Subsequent work investigated this hypothesis further. Litov, Moreton & Zenger (2012) show, on the one hand, that more unique and costly-to-evaluate strategies, such as corporate diversification, receive less analyst coverage; on the other hand, that firms that receive more coverage trade at a higher premium relative to firms receiving less coverage. Relatedly, Feldman 2015 explores further the role that analysts and their cognitive limitations might be playing in providing ratings which in turn affect valuations.

Confounders. One of the earliest methodological contributions to the debate on resolving the issue of whether related diversification is associated with superior performance was to raise the possibility of omitted variables (e.g. market structure, unobserved firm quality) that may be influencing the results. Following this logic, the argument went, the differences between diversifying and non-diversifying firms could be related to the characteristics of the markets (Chang and Thomas, 1989; Christensen & Montgomery, 1981) or the industries (Bettis, 1981; Bettis & Hall, 1982; Park, 2003; Scherer, 1965) in which those firms were operating, or may be the result of unobserved heterogeneity in firm quality that could drive both the decision on the level of relatedness that should be sought and the performance outcome (Bettis & Hall, 1982) rather than superior or inferior performance being a direct effect of the diversification strategy pursued by the firm.

For instance, Christensen and Montgomery (1981) found evidence of a tendency of firms pursuing a related-constrained strategy to operate in high-growth and concentrated markets. At the same time, most unrelated diversifiers were operating in markets with low profitability, low concentration and low market share (which led them towards diversification). Selecting samples from different industries and comparing the results, Bettis and Hall (1982) suggest that there might not be statistically significant performance differences between firms belonging to the different Rumelt's categories if not for those relating to industry differences. Similarly, Grant and Jammine (1988) investigated the differences in firms' profits and sales performance in a sample of large UK firms classified according to the Wrigley/Rumelt diversification categories. Controlling for the influence of other firms and industry differences, these studies identified the existence of a significant positive relationship between diversification and firm performance, but did not find any evidence of the superiority of related versus unrelated diversification. In addition to the importance of controlling for market and industry characteristics in the analysis, additional elements have been brought into the discussion, such as the issues of accounting for differences in the time and economic period of observation (e.g. McDougall & Round, 1984); for the level of firm leverage (Lamont & Polk, 2001) and for the specific accounting policies that might alter the result depending on whether diversification was achieved via acquisition or not (Custodio, 2014).

Form of the relationship. The functional form of the relationship between diversification and performance has also been the subject of debate, with some studies suggesting a curvilinear form as the best approximation of the relationship, with diversification bringing the maximum performance benefits at moderate levels (e.g. Hoskisson & Hitt, 1990; Lubatkin & Chatterjee, 1994; Markides, 1992). Palich, Cardinal & Miller (2000) systematically reviewed all the literature in this area and tackled this issue head-on, identifying three alternative functional

forms of the relationship from prior literature (i.e. linear, inverted- U and intermediate). They conduct a meta-analysis using data generated from more than three decades of empirical research in order to assess which of the three models best approximates the relationship. Their results provide support for the inverted-U model, when performance is measured using either accounting or market-based measures.

While this study remains the most established result on the general nature of the relationship between performance and diversification, a few studies have explored the form of this relationship in different specific contexts. Matusik and Fitza (2012) suggest that in the very specific case in which diversification is focused on a particular class of assets (i.e. knowledge assets) a U-shaped relationship is found between diversification and performance, due to the fact that at low level of knowledge diversification firms experience the benefits of knowledge specialization, and at high level of knowledge diversification firms experience the benefits derived from the ability of solving complex problems; moderate levels of diversification, instead, yield the worst results. Other studies focus on the specific case of intra-industry diversification. Zahavi and Lavie (2013) show the existence of a U-shaped relationship between intra-industry product diversity and performance: the existence of negative transfer effects initially undermines firm performance when product diversity increases; however, when diversity increases still further, the resulting economies of scope lead to an increase in performance. The level of technological investment makes this effect even more pronounced, whereas the firm experience with intra-industry diversification tends to reduce it. Hashai (2015) suggests that the relationship between intra-industry diversification and performance might actually be S-shaped, due to the relationship between adjustment costs, coordination costs and within-industry diversification benefits. Although this study is consistent with Zahavi and Lavie (2013), in that performance declines at low-levels of diversification, this result contrasts the Zahavi and Lavie (2013) study in that it does not predict a decline at high diversification

levels. The author suggests that this inconsistency may be due to the characteristics of the measures used for intra-industry diversification in the two studies, with the Hashai study employing a measure that captures penetration in new product categories as opposed to expansion in existing categories.

Direction of causality and self-selection. An important issue in interpreting the D-P relationship concerns the possibility that the observed relationship is a product of selection rather than treatment. Note that Rumelt originally had raised a version of this possibility suggesting a reversal of causality: poor performing firms diversify into distant industries, rather than that unrelated diversification leads to poor performance. The finance literature has indeed probed this line of reasoning at some length and argued for exploring the endogeneity of the decision in the first place.

Following this logic, studies focused on the causality in the observed empirical relationships between diversification and discounts in market value: essentially, they focused not so much on challenging the existence of a diversification discount, but more on whether it could be causally attributed to diversification per se (Erdorf et al., 2013; Martin & Sayrak, 2003). In this stream, Graham, Lemmon and Wolf (2002) found that participants in such diversification programs also had "discounts" in their last year as stand-alone firms. Consistent with the earlier Rumelt "escape" conjecture, Lang and Stulz (1994) and Hyland and Diltz (2002) found that diversifiers were poor performers prior to conglomeration. Campa and Kedia (2002) find a strong correlation between a firm decision to diversify and firm value. Park (2003) finds that related acquirers were more profitable in their industries than unrelated acquirers, prior to acquisition; and related acquirers were in more profitable industries than unrelated acquirers, prior to acquisition.

More recent studies look even more closely at the relationship and identify more complex endogenous relationships. Gomes and Livdan (2004) suggest that diversification is often the result of bad productivity shocks and this might explain the diversification discount. An alternative explanation is advanced by Levinthal and Wu (2010) who instead argue for the possibility that diversifying firms are high-capability firms operating in low performing market contexts. Firms operating in more mature markets are more likely to diversify earlier than other firms. This leads to total profit growth but to lower average returns due to the fact that they spread their non-scale free capabilities across segments.

Consistent with this logic, Wu (2013) suggests that the higher opportunity costs faced by more capable firms in more mature markets leads them to diversify. In line with the idea that diversification is chosen by the best firms, DeFigueiredo and Rawley (2011) suggest that, when managers require external investment to expand, higher-skilled firms will be more likely to diversify.

Considerations and Implications for Future Research. In Table 3 we provide a synthesis of the core studies reviewed in this section of the paper. More generally, the review of methodological issues in assessing the diversification-performance relationship suggests that diversification and performance can both be measured in multiple ways and the different measures of diversification and of performance may be only limitedly correlated. Further, individual diversification measures such as an entropy index, count measure, or Herfindahl measure, may in fact not be closely related with the same measure calculated using a different dimension of diversification (e.g. relatedness in technology rather than skills or markets . This suggests that the underlying micro-mechanisms by which diversification affects performance differ substantially across the different dimensions of diversification. Although establishing a single universal relationship between diversification and performance is useful for many

purposes, it may also be sacrificing much information and nuance; nuance that could be critical in providing guidance to managers. A very useful complementary line of research to the past work seeking a broad relationship between diversification and performance would instead embrace the richness that the work on the D-P relationship has demonstrated. Research has clearly established that diversification and firm performance are both inherently multidimensional phenomena acting upon each other through a myriad of connections. Any attempt to rest after establishing a stable, single relationship here may be guilty of settling for far less than we can truly extract from the past. Sounding a caution commonly attributed to Einstein, we note that "everything must be made as simple as possible, but not any simpler." Hence, we should embrace the rich information embedded in these complex relationships and seek some other path to collate and make sense of them. This is a direction we develop later in the next section of this paper.

INSERT TABLE 3 HERE

Revitalizing Research on Diversification: A Mechanisms-Based Perspective

The foregoing review above should have clarified several issues. First, most importantly, it should have clarified that the question "does diversification affect performance" (or, for that matter, the question "does related diversification imply superior performance relative to unrelated diversification") is probably quite broad and aggregative. Diversification occurs in many different ways (e.g. inputs, markets, technology, etc.), is conducted for many, sometimes conflicting, reasons, and affects multiple performance measures, often in different ways. In other words, any consistent overarching relationship between these constructs is likely to be open to a serious interpretation problem, in terms of how such a relationship can be really used in practice- as well as face concern over its domain of applicability.

Second, the survey should have highlighted that the typical research setting for a diversification study – i.e. a broad cross-sectional sample spanning many firms in many industries - is likely to compound the concerns of interpretation and domain applicability. Given the many, often conflicting objectives that lead to diversification and the many mechanisms through which diversification affects performance, it is unlikely that a given mechanism or set of mechanisms will be pervasive across large samples. The complexity of the relationships identified earlier suggests that testing many of the arguments would require fairly nuanced research designs. Unfortunately, to expect them to hold strong in a single large cross-industry sample of firms may be too optimistic –something that could explain why so many individual studies have found conflicting results.

Third, the review highlights that establishing causality in this relationship is tricky and there are strong reasons to expect that reverse causality and miscellaneous endogeneity problems may be rife in this setting. This draws attention to a difficulty with the fairly common "broad cross-section of industry" research design. As finance researchers have indicated, there may be reasons to worry about finding or using instruments in such a sample (Santalo' & Becerra, 2008). Indeed, to the extent that endogeneity remains a concern, it is quite possible that an exogenous shock or other endogeneity-addressing technique that could enable a slightly stronger case for causality to be made may be much easier to identify and execute in a narrower, targeted sample.

Finally, although it is undoubtedly useful to get an aggregative picture of the D-P relationship, such an understanding is highly complementary to a more fine-grained understanding of the individual mechanisms through which diversification benefits and costs play out. This is important not just for good scholarship, but also in this particular context, for advising and informing managers, which is part of the reason for studying the phenomenon in the first place. Telling a manager – "yes there is some evidence for a weak relationship between

related diversification and performance but we really can't explain why" would not be very complete advice.

Building on the foundational premise that the essence of diversification is that of conducting multiple activities (underlying multiple business) within the boundaries of the same corporation and that the interdependence between these activities explains the performance effect of diversification (Levinthal, 1997; Milgrom & Roberts, 1990; 1995), we suggest that complementary approach to the study of diversification would be based on an understanding of different types of synergies or anti-synergies that emerge when bundling together different types of activities or products. These synergies and anti-synergies are what we call "micro-mechanisms". These micro-mechanisms are really at the source of the relationship, and to claim a true causal effect it would be important to identify the micro-mechanisms at work and show them leading to a specific performance effect. This suggests that uncovering and focusing on the key mechanisms linking firm scope to performance would be a key starting point for a new approach, and it is to this task that we now turn.

Identifying The Micro-Mechanisms Underlying The Diversification-Performance Relationship

To support the advancement of a micro-mechanisms approach to the study of diversification we use our comprehensive review of prior studies to identify the mechanisms at play in the context of diversification. In order to do so a) we begin by examining the different theoretical perspectives that existing research has employed in order to explain why diversification occurs in the first place, providing theoretical foundations to the study of this phenomenon; b) thereafter, we draw on these perspectives and identify from prior research the mechanisms at play in the context of each theoretical motivation for diversification c) finally, we outline the core principles of a micro-mechanisms based approach to the study of the D-P relationship.

Theoretical Perspectives Explaining Why Diversification Occurs

We identify the core perspectives presented in the literature and organize them into broad categories. In the first category we locate theories that have made the case that diversification can be a value enhancing decision for corporations and have focused on identifying the broad economic logic of the value created. These perspectives are also the basis for our subsequent section that looks at the precise mechanisms through which diversification provides synergies (i.e. adds value) and also the ways in which diversification creates anti-synergies (i.e. introduces new costs). These perspectives include the *resource-based view, transaction cost economics*, what we label as *strategic behavior* and *financial theories of risk-reduction and information efficiency*. However, in addition to these synergy-seeking perspectives the literature has also identified other motivations for diversification. Although these other motivations do not necessarily help us to understand the mechanisms underlying synergies, for completeness we list them in this review as well, in part to highlight that the motivations for diversification can be quite diverse in themselves.

In the second category we place theories that are (potentially) consistent with shareholder-value maximization, but focus on the uncertainty and bounded rationality that corporate decision-makers face. In this group we included *evolutionary economics*, *organizational learning and institutional theories* of diversification. These theories can be interpreted as viewing diversification as a mechanism through which managers learn about the environment, expand their cognitive capabilities, and seek legitimacy through conformity with their peers in an uncertain environment. In the last group we focus on explanations of diversification that are largely inconsistent with shareholder value maximization. In this group we list *agency theory*, which argues that diversification may be related to enhancing utility for managers. These last four theoretical perspectives do not appear to draw upon the notion of synergy to explain diversification as we will note in the brief synopses ahead.

Theoretical perspectives underlying shareholder-value-maximizing, synergy-seeking diversification. We start by reviewing theoretical perspectives that see diversification as a value-enhancing strategy.

Diversification and the resource-based view of the firm. The issue of corporate strategy and diversification has historically been the object of research within the resource-based view tradition beginning with Penrose's (1959) work on firms' growth and Chandler's (1962) work on strategy and structure as well as studies on the core competence of the corporation (Hamel & Prahalad, 1990). Within the resource-based view of the firm, the resources held in the corporate portfolio determine the scope and the direction of the firm diversification move (Penrose, 1959). This is due to the fact that resources are mainly acquired in 'bundles' and part of those resources remains unused (Mahoney & Pandian, 1992; Wernerfelt, 1989). Firms are incentivized to diversify in order to use their excess capacity of resources that have multiple uses but that are subject to market failure (Helfat & Eisenhardt, 2004; Montgomery & Wernerfelt, 1988; Peteraf, 1993; Teece, 1982; Wernerfelt, 1984).

In this respect, the resource-based view provides a theoretical basis for the existence of a performance effect of diversification. The competitive advantage of diversifying firms originates from the fact that they can be getting access to resources at a "price" that is lower than the market price, they can enjoy economies of scope. As a result firms have an incentive to expand into other domains if expansion can provide a way of using the unused capacity (Penrose, 1959). In addition, diversified firms have the opportunity to accumulate strategic assets - not otherwise available through the market - more rapidly and at lower costs than competitors (Markides & Williamson, 1994; 1996).

It follows that the benefits generated by diversification depend on the extent to which resources can be shared across businesses, i.e. on their fungibility. This mechanism provides the basis to theorize a possible superiority of related diversification over unrelated diversification, due to the fact that when the distance between businesses increases, not only does the value of the resources decrease, but also their firm-specificity, reducing the advantage of diversification (Mahoney & Pandian, 1992; Montgomery & Wernerfelt, 1988; Wernerfelt & Montgomery, 1988). In addition, the characteristics of the demand environment also have a role in determining firm's profitability in that they influence the opportunity costs associated with the use of firms' resources in certain domains rather than others (Levinthal & Wu, 2010; Wu, 2013).

Diversification and transaction costs economics. Following transaction costs theory, firms' decisions to diversify into other businesses - either vertically related or horizontally related – might be driven by the opportunity that internalization could offer to reduce the transactions costs of market exchange (Jones & Hill, 1988). For instance, moral hazard and information asymmetries between interacting businesses may be reduced as a result of diversification.

Diversification potentially reduces the costs of transactions through various mechanisms. First, internalization reduces the need to write complex contracts between the various parts of the business (Arrow, 1974) and enables a business to invest in relationship-specific assets, resulting in lower costs for the production of goods and services (Klein, Crawford & Alchian, 1978) even if there is an imperfect market for those goods or services. It also allows for the realization of economies of scope that—despite the fact that they could in principle happen also in the open market—are made difficult by the presence of bounded rationality,

opportunism, and information impactedness (Argyres, 1996; Kay, 1982; 1984; Jones & Hill, 1988).

From a performance implication perspective, transaction cost-induced diversification could improve performance, but only if there is discriminating alignment involved (i.e. the underlying transactions are subject to high asset specificity and uncertainty and hence integration is the appropriate solution). However, such conditions are unlikely to be widespread across all industries: as different samples might be associated with differing degrees of asset specificity and uncertainty, one might not be surprised to find effects in different directions if this were the only argument driving diversification (see Santalo' & Becerra, 2008).

Diversification and strategic behavior. Strategic behavior theories suggest that diversification is beneficial in part because a firm's simultaneous presence in multiple markets provides competition-related advantages due to the possibility of coordinating strategies across these markets. First, diversification can lead to multi-market contact between firms (Edwards, 1955) enabling coordination with the firm's competitors and the achievement of mutual forbearance and reduced competition (Baum & Greve, 2001, Baum & Korn, 1999; Li & Greenwood, 2004). Second, firms with multiple businesses and cash-flow streams may use cash generated through one business to cross-subsidize another business, thus giving the second business an advantage in its market (Amit & Livnat, 1988; Meyer, Milgrom, & Roberts, 1992; Scherer, 1980). Third, firms may enter a vertically related (upstream or downstream) business and limit the access of their competitors to suppliers or buyers, i.e. foreclosure (Hart & Tirole, 1990). Note that while we classify these types of moves as strategic behavior and value-enhancing an important caveat to the value-enhancing part is that these motives for diversification can also be illegal for antitrust reasons. For instance, diversification conducted purely for either foreclosure or to create multi-market forbearance will likely be ruled illegal.

From a research perspective it follows that strategic-behavior-motivated diversification's effect on firm performance is contingent on the characteristics of the firm's environment, most importantly the degree of market power enjoyed by the firm and its buyers and suppliers in various businesses. This suggests that research designs that try to capture strategic behavior mechanisms as controls or as main hypothesized effects, need to be tailored quite precisely. The first of these three effects (i.e. multi-market contact) requires close study of competitors contemporaneously meeting in multiple sub-markets; the second (i.e. cross-subsidizing) requires a longitudinal analysis of competition between incumbents and entrants; and the third (i.e. foreclosure) requires an analysis of vertical power between buyers and suppliers in individual segments. It is unlikely that any single sample will accurately reflect all these required characteristics.

Diversification and financial theories of risk-reduction and information efficiency. From a financial-theory perspective diversification can be motivated by risk reduction, tax savings or information economies. The risk-reduction benefit of diversification would arise if the corporation, through its own ability to diversify, could reduce some risk that the shareholder could either not diversify away on their own or could not diversify away as cheaply. For instance, if capital markets were inefficient and did not permit adequate diversification opportunities, and the corporation could diversify, that would be beneficial to the shareholder. Such opportunities could arise for instance if private assets were a significant part of the economy and these were unavailable to the shareholder on their own or if the capital market was inefficient or frozen for some reason. Diversification could also enable present value benefits on taxes paid by facilitating tax write-offs to be taken earlier (Hayn 1989; Jensen & Ruback, 1983). Firms with losses in some businesses can write those off against profits in other businesses within the same time period, provided they do have businesses that are making

profits. If they were not diversified, the losses would have to be carried forward. Hence, the timing of the tax savings can be brought forward, leading to a saving in present value terms. Information benefits of diversification would arise if the firm management could evaluate business opportunities more effectively than the market because information can be more freely shared within the corporation than across markets, leading to superior resource allocation (Jones & Hill, 1988; Williamson, 1975). This is the internal capital markets rationale for diversification.

Theoretical perspectives underlying (potentially) shareholder-value-maximizing, non-synergy-seeking diversification. As noted earlier, there are also non-synergy seeking explanations for diversification. Although they do not directly provide inputs for how managers could improve diversification outcomes, for completeness we review them here as well.

Diversification and organizational learning/evolutionary theory. Within organizational learning theory, diversification is one mechanism through which firms aim to overcome the limits to their corporate cognition. Diversification represents a mechanism for organizational learning, through which firms develop knowledge in areas in which they are not familiar (Kazanjian & Drazin, 1987; Normann, 1971, 1977). Diversification and the industry entry and exit activities it involves can also serve as a process of search and selection conducted by the firm to improve its fit with the environment (Chang, 1996; Galbraith, 1982; Roberts, 1978). Further, the effectiveness of diversification is contingent on the strategic fit between the learning requirements of the firm and the structural and procedural arrangements made by the firm to achieve the intended result (e.g. Argyres, 1996; Kazanjian & Drazin, 1987; Kim, et al., 2013). An implication of this perspective is that, if diversification is carried out for learning reasons through sequential entry and exit, then the best research design to capture it (consistent

with the point made in the previous paragraph) would not be a cross-sectional multi-industry study but a much more focused longitudinal study.

Diversification and institutional theory. Seen through an institutional theory lens, diversification occurs as a result of mimetic isomorphism, as organizations tend to follow similar and successful organizations into new markets (e.g. Haveman, 1993; Fligstein, 1991). The benefits of following such an isomorphic approach come in several forms. First, by imitating the actions of other organizations, a focal firm economizes on search costs while addressing uncertainty (Haveman, 1993). Second, firms acquire legitimacy by adopting courses of action that are "institutionalized", i.e. followed by other social actors in the market (Davis, Diekmann & Tinsley, 1994). This theoretical lens has been used to justify the empirical tendency towards refocusing that firms have followed in the early and mid-1980s. Because firms require legitimacy from financial market participants, they may feel pressured toward refocusing by these actors (Zuckerman, 1999; 2000).

This logic implicitly suggests that isomorphic diversification will tend to materialize if the environment is characterized by higher uncertainty and complexity. In these kinds of contexts, other firms' actions, and the assessment that these actions receive, can take the role of signals, which help reducing and navigating the inherent ambiguity that characterizes the environment. In less complex contexts or better-understood contexts (such as mature industries, for example), these kind of signals are likely to play a less salient role in corporate action. Note also that the institutional theory rationale for diversification does not actually suggest any strong or direct impact on performance. If imitation is appropriate, firms will do well from diversifying for isomorphism reasons; if not, they may not. In other words to the extent that some diversification is driven by isomorphism, in a diversification-performance investigation, it may indicate no relationship between diversification and performance.

Theoretical perspectives underlying non-shareholder-value-maximizing diversification. Finally, diversification has also been studied by scholars relaxing the assumption that diversification is a shareholder-value-maximizing strategy.

Diversification and agency theory. Managers' decision to engage in diversification has also been heavily investigated by scholars using an agency theory perspective. Agency theory suggests that utility maximizing agents make decisions that are not necessarily aligned with the interests of the principal. Diversification occurs because managers – not being full residual claimants – make decisions that maximize their own utility rather than the firm's utility.

Diversification can increase managers' utility via two commonly argued mechanisms (Aggarwal & Samwick, 2003). First, managers with high equity ownership or high firm-specific human capital derive utility from diversification and the attendant reduction of the idiosyncratic risks that they personally face, despite the fact that stockholders could diversify on their own – at least to some extent- in capital markets (Amihud & Lev, 1999; May, 1995). Second, managers diversify because they derive private benefits from it (Jensen 1986; Stulz, 1990), which come in the form of higher prestige, power, or better career prospects (e.g. Jensen & Murphy, 1990; Shleifer & Vishny, 1989).

Building on some earlier evidence that diversification is negatively related to managerial equity ownership (e.g. Amihud & Lev, 1999; Denis, Denis & Sarin, 1997; May, 1995) a lively debate has played out in this area on whether the act of monitoring by a firm's principal influences a firm's diversification strategy (e.g. Lane, Cannella & Lubatkin, 1998; Amihud & Lev, 1999; Denis, Denis & Sarin, 1999; Lane, Cannella & Lubatkin, 1999).

Although managerial-agency-driven diversification does not necessarily seek synergy, the implications of managerial- agency- driven diversification for firm performance are not necessarily straightforward. Some of the common mechanisms through which managerial

agency hurts firms are open to conflicting interpretations. For instance, it has been argued that managers may over-diversify to reduce their own employment risk (Amihud & Lev, 1999). However, other work raises issues about whether this is really value-destructive. First, to the extent that diversification is good for firms (cf. the diversification premium mentioned earlier), even though the primary goal of unrelated diversification was to benefit managers, it is unclear that this would necessarily hurt firms. Indeed, researchers have made the argument that such diversification may reduce earnings volatility and hence enable less noisy measurement of manager performance, and also may reduce managers perceived risk and expected return from employment (Marshall, Yawitz & Greenberg, 1984).

Alternately, managers may choose to diversify in ways that further entrench them for instance by entering businesses where their skills are particularly valuable to the company (Schleifer & Vishny, 1989). Again, it is not clear that this necessarily destroys value. Firms often face many alternative growth paths and *a priori* it is often not clear that a given path is better than others (Chang, 1996). In such circumstances managers will make calls; and their own expertise is not always a bad basis on which to make a decision. More generally, the diversification of the manager's own risk, as well as the maximization of their utility, is not necessarily in conflict with the maximization of the firm's performance. For instance, it could be argued that – given the temporary nature of the manager's association with the company- agents might privilege short-term-ism; however in this event too there is no performance penalty to the firm when the maximization of short-term returns is the best strategy given the context in which the firm is operating. For example, this could be dependent on the lifecycle of the firm or the industry in which the firm is operating or on the economic cycle.

Of course, it is quite probable that managers could and do make choices that maximize their private benefits even though these choices may not be in the interest of the firm (thus diminishing firm value). The broader point we make here is that, given these multiple

conflicting mechanisms at work, finding reliable and statistically-significant effects across varied, large samples is likely to be difficult; further such results once found may also be difficult to interpret in a more granular fashion given the variety of motivations at work. From a research design perspective we note that broad samples of companies may aggregate too many of these conflicted effects to present a statistically visible and meaningful tendency, and therefore the ideal research design to capture these mechanisms may be narrowly focused and, indeed ideally, specific to the individual mechanism that is being posited.

We provide a synthesis of the core theoretical perspectives addressing the phenomenon, the core assumptions underlying them and the core mechanisms of value creation determining the choice in Table 4. Unlike the previous tables, this table is organized by research perspectives rather than by studies for the sake of avoiding duplication.

Uncovering the theoretical bases of why diversification occurs has certainly contributed substantially in advancing research on the diversification-performance relationship. Its most notable contribution is in the fact that it has started the task of unpacking the diversification-performance linkages into its building blocks, i.e. mapping the mechanisms linking firm's choices to diversify to the observation of specific benefits that could potentially lead to a superior performance.

However, this research is also useful in a broader sense. The sheer variety of the reasons that cause firms to undertake diversification and the potentially conflicting effects of some of these mechanisms that have been unveiled by this research lead us to conclude that large, cross-sectional multi-industry samples may be a difficult terrain within which to find significant effects, explaining the conflict in prior studies. We suggest that an alternative approach would be to use these basic motivations underlying diversification listed above to identify and organize the main sources and micro-mechanisms that underlie the benefits and costs created

through diversification. The last column of Table 4 connects these theoretical motivations to the main forms of benefits (synergies) and costs (anti-synergies) that emerge as these motivations are played out through actual diversification.

INSERT TABLE 4 HERE

The Mechanisms Underlying the Diversification-Performance Relationship

We note that the core micro-mechanisms underlying the diversification-performance relationship have been uncovered by past research but have not been emphasized as much as they should be. Specifically, we identify four types of synergies discussed or implied in existing research that emerge by bundling together different businesses and their underlying activities: horizontal and vertical operating synergies, strategic synergies, and financial synergies. We build this typology drawing upon the various studies mentioned earlier but also the key text books in the field (Barney 1997; Puranam & Vanneste, 2016; Zenger, 2016).

We begin by noting that the main theoretical perspectives that explain why firms pursue synergy-seeking diversification provide a natural source for identifying these different types of synergies. The resource-based view arguments suggest that sharing resources across operational activities for different product lines can provide synergies – we call these *horizontal operating synergies*. The transaction costs economics approach suggests that - under specific transactional conditions - buyers or suppliers can obtain market power over the focal firm: neutralizing this power through vertical integration can be a source of synergies, which we call *vertical operating synergies*. The strategic behavior of companies, wherein they attempt to reduce competition in their own markets (e.g. through multimarket forbearance), enhance their own position in a market using revenues from other markets they operate in (i.e. cross-

subsidization of products) or increase their market power versus their suppliers and buyers (e.g. through foreclosure), leads to the uncovering of *strategic synergies*. Finally, using financial theories of diversification suggests the possibility of *financial synergies* such as risk reduction and tax benefits. Within each of these broad mechanisms, we in turn identify several distinct sub-mechanisms that have been mentioned in the literature.

Synergies. The first type of synergies, i.e. *horizontal operating synergie*s, emerges as benefits from sharing assets and activities across businesses. These synergies can emerge both on the cost and on the demand side. On the cost side, horizontal operating synergies occur through economies of scale and scope originating from the sharing of common core resources or activities across businesses that do not transact with each other. For example, P&G's ownership of both shampoo and shaving blade businesses might lead to cost reduction due to the sharing of distribution channels. On the demand side, they can occur through brand spillovers or perceived higher performance for customers and thus willingness to pay complementarities. For example, a firm's brand in one line of business may be extended into a related market because the same customers buy both products and would recognize and accord a product goodwill because they were familiar with the brand or because buying multiple products from the same provider leads to convenience (e.g. Bettis, 1981; Bettis & Hall, 1982; Grant & Jammine, 1988; Puranam & Vanneste, 2016; Rumelt, 1974; 1982; Wrigley, 1970; Zenger, 2016).

Vertical operating synergies arise when conducting the activities from successive stages of a value chain (upstream and downstream) within the same company reduces costs or improves the quality of the ultimate product. Vertical benefits arise through better coordination between stages of production and countering the opportunism of buyers or suppliers (e.g. Arrow, 1974; Hill & Hoskisson, 1987; Jones & Hill, 1988; Williamson, 1975).

A third type of synergies, *strategic synergies*, arises because simultaneous presence in multiple markets provides competition-related or strategic behavior benefits as described earlier. Multi-market forbearance and cross-subsidization benefits were mentioned earlier. Strategic synergies could also emerge due to increase in market power that originates from increase in size and reputation associated with diversification (e.g. Amit & Livnat, 1988; Li & Greenwood, 2004; Meyer, Milgrom, & Roberts, 1992; Scherer, 1980).

Finally, *financial synergies* arise from the co-location of two businesses and their correspondent cash flows and decision-making activities within the same legal enterprise. These synergies take multiple forms. For example, they can take the form of risk-reduction. If the cash flows of the individual businesses in which the firm is present are negatively correlated, the firm can realize "safer" cash flows and can face a decreased bankruptcy risk (Lewellen, 1971) as well as obtain taxation benefits. An additional benefit is internal capital market efficiency, meaning a diversified firm could be run as an internal capital market. Headquarters have the ability to access the accounts of the individual businesses and can therefore be more efficient in its deployment of capital than entities that are outside the corporation and do not enjoy such preferential access to the accounts of the businesses (e.g. Amit & Livnat, 1988; Lewellen, 1971; Scott, 1977; Williamson, 1975). A synthesis of the main types of synergies and of the micro-mechanisms they entail is reported in Table 5a.

INSERT TABLE 5a HERE

Anti-synergies. In parallel to the generation of synergies, managing different business within the same corporation might also originate substantial costs or anti-synergies (e.g. Puranam & Vanneste, 2016; Zenger, 2016). Although this aspect has not been studied as extensively by existing research, we identify nine distinct types of costs attending

diversification. Table 5b provides a synthesis of the main types of anti-synergies identified and the core illustrative studies that refer to them.

First, we consider coordination costs, which arise from the coordination required to share resources across businesses. Coordination costs relate to the complexity of organizing the use of resources among multiple actors/units and the increase in communication and decision activities required to do so (e.g. Hill & Hoskisson, 1987; Jones & Hill, 1988; Rawley 2010; Zhou, 2011). Second, we consider the opportunity costs of the resources. These are costs related to the fact that, at any point in time, resources need to be allocated among alternative, competing, activities: choices made regarding the use of a resource might imply the costs of a better foregone opportunity (Helfat & Eisenhardt, 2004; Levinthal & Wu, 2010; Penrose, 1959; Teece, 1982). The most common locus of such opportunity costs is managerial attention and focus.

Third, administrative costs or bureaucratic costs are the costs that emerge due to the inefficiencies that increase in organizational size and complexity, which tend to cause loss of scale, increased operating leverage, loss of efficiency due to captive customers/suppliers, and limits to exploration (e.g. Jones & Hill, 1988; Sutherland, 1980;Williamson, 1975).

Fourth, adaptation costs (also referred to as organizational rigidity costs or adjustment costs in prior research) are the costs of adapting the resources, routines and practices that are currently employed in existing businesses to new ones (e.g. Leonard- Barton, 1992; Kaplan & Henderson, 2005; Rawley, 2010)

Fifth, learning and absorptive capacity costs refer to the costs of understanding and learning in new contexts (e.g. Penrose, 1959)

Sixth, compromise costs are the costs related to the lower performance obtained in a specific use of a resource due to the simultaneous attempt to maximize its joint performance across all uses. These costs for instance could emerge due to the fact that a firm might choose

to develop or acquire more generic inputs or assets with the purpose of increasing their usability across applications, and this might lead to an undercutting of its value addition in any specific usage. Such costs may also emerge from the overestimation of similarities between businesses and the potential of the firm to benefit by sharing resources between them (e.g. Hill & Hoskisson, 1987; Markides & Williamson 1994; Porter, 1980).

Seventh, contagion costs originate when declines in the value of a resource imply declines in the value of the same resources for other product categories as well (e.g. Greenwood et al. 2005). For example, the decline in the value of a brand that might emerge as the result of an accident in a corporate facility may imply declines in the value of that brand for other product categories as well.

Eighth, conflict costs relate to the non-optimization of the investment decisions and to the inefficient allocation of capital among different units due to the internal power struggles generated by diversification as well as agency and influence behavior (Hoskisson & Hitt 1988; Jensen, 1986; Jensen & Meckling, 1976; Kumar, 2013;Meyer, Milgrom, & Roberts, 1992; Rajan, Servaes, Zingales, 2000; Scharfstein & Stein, 2000; Stulz, 1990).

Finally, a ninth source of costs that may be related to diversification are information and control costs, i.e. the information inefficiencies that are experienced when the increasing difference across businesses leads to limitations in information processing and in setting up dedicated control mechanisms (e.g. Berger and Ofek, 1995). Table 5b includes a complete list of studies identified in our review that refer to these types of costs.

INSERT TABLE 5b HERE

Outlining the Essence of a Mechanisms-based Perspective to Studying Diversification

Our recommendation for a fine-grained, mechanism-based approach to the study of diversification consists of three parts. First, we argue that the essence of using the diversification-performance relationship to advise managers on specific trade-offs is through the *identification of the underlying mechanisms* through which the influence works; hence, it makes sense to focus the analysis on the basic micro-mechanisms that connect a given form of diversification to a given type of performance. These micro-mechanisms are the actual or implied synergies and, very importantly, the anti-synergies or costs arising from bringing two businesses together. These were just identified in the previous section.

The second key issue to consider is that the approach advanced in this paper would suggest that one would not necessarily look to directly measure market value or other accounting or financial measures of firm performance. Instead, one might consider the actual mechanism being evaluated, *look for proximate outcomes* closely connected with that mechanism, and seek to evaluate the effect of changes in firm scope on that outcome. For instance, a researcher investigating a multimarket competition strategic benefit may choose to examine price stability or histories of price changes in the relevant product categories rather than net return on assets or another distant performance measure. Similarly, asset-sharing diversification could be evaluated through capacity-utilization metrics; diversification engaged in to improve the customer's use experience by providing higher quality complements may be better evaluated by looking at increases in market share, and so on. Reducing the distance between cause and effect is particularly important in the context of the hyper-complex set of influences that emerge in a diversification setting.

Third, we argue that large, multiple industry spanning, samples may not be ideal to really understand the mechanisms at work here. As our earlier review indicates, the mechanisms are often nuanced, and different rationales for diversification occasionally conflict with each other. In a large cross-industry sample, it is very likely that multiple motivations and mechanisms are

at work, so any final effect would be a mix of multiple effects. Therefore, we advocate an alternative to simply collecting diversification metrics on a large sample of firms and regressing them against some measure of performance. Our approach suggests that scholars may have to *first* identify a particular mechanism through which diversification benefits a relevant dimension of firm performance and *then identify a sample* of firms at risk of engaging in such diversification, constructing treatment and control groups to isolate the effect of the studied diversification synergy. This approach also draws attention to and can potentially account for another common problem surfaced by the review: the selection versus treatment debate. Do bad firms diversify or does diversification lead to good or bad performance? Indeed, as we note below, a good research design made possible once we step away from a large cross-industry sample may enable us to handle many other causal inference concerns as well. The point is that in this approach, identifying the appropriate context and obtaining a "precision" sample is likely to be the most time consuming part of the research design.

Such samples could be pairs of related industries (e.g. taxis and limousines as in Rawley & Simcoe, 2010; home building and home financing as in Gartenberg, 2014), broader samples (e.g. Feldman, 2014) or related industries (e.g. Gartenberg, 2014) facing a common shock. Given the three features of our new approach, the typical research study in this setting would focus on a given type of micro-mechanism. Rather than argue that "relatedness" in general is good or bad, research would focus on identifying the conditions under which a micro-mechanism yielded benefits and the costs associated with targeting that micro-mechanism.

To provide an illustration of recent studies in that vein, consider Zhou (2011) who looks at a specific type of micro-mechanism, input sharing, and highlights that while product lines can enjoy synergies through input sharing, such activity is also associated with significant coordination costs. For firms that already have complex existing businesses, such synergies may not be worth realizing. In her research she targets a very specific form of synergy and

anti-synergy and then identifies a research design that is targeted to enable testing of this idea. Another study of this type is Rawley and Simcoe's (2010) analysis of taxi-cabs and limousines where they focus on and identify key diseconomies of scope that arise as firms, in their case, increase vertical scope. Building on Coase (1937) and Williamson (1975), they assume that vertical disintegration occurs as a result of the fact that companies outsource when the costs of integration exceed the costs of using the market. In order to test their theory, the authors identify an industry, i.e. the taxicab industry, where deregulation in the 1990s led to a wave of diversification and where they can observe variation in vertical integration. A pre-deregulation variation in local markets serves as an instrument for post-deregulation incentive to diversify. This research design allows them to show that diversification into new businesses (i.e. the limousine business) leads firms to increase their level of outsourcing, by shifting the composition of their fleets toward owner-operator drivers.

Another example in this context is Gartenberg's study on the mortgage industry (2014), which focuses on understanding how the boundaries of firms affect their ability to adapt to changing external conditions. She suggests that the constraints imposed on more diversified firms by the presence of an internal capital market might affect their ability to adapt to change. In line with the specific mechanism that she aims to investigate, she identifies the mortgage industry in the 2000s as a potential industry in which this effect could be observed and builds an appropriate research design.

What is particularly notable in these studies is the targeting of a precise form of synergy or anti-synergy rather than a broad-based search for superiority of relatedness or otherwise. We expect that over time, as research builds understanding of synergies and their associated costs, it may even be possible to develop decision-aids that could be useful for managers in order to assess which types of complementarities are likely to matter most for a planned diversification move and what costs are likely to be associated with them.

Note of course that in this kind of micro-mechanism-driven research agenda there is no overarching relationship being sought or found. Rather, every study is uncovering either a micro-mechanism or a contingency that affects this micro-mechanism. What would be helpful is a broad organizing framework that can help us house all the individual findings that this approach generates. The nascent theory of complementarities (Ghemawat & Levinthal, 2008; Milgrom & Roberts, 1995) can provide such a broad super-structure for organizing this research. Definitionally speaking, a complementarity occurs between two activities when the marginal value of each activity is enhanced in the presence of the other. We note that a combination of firm activities or products can generate synergies and costs or anti-synergies. A given diversification move is meaningful if the specific synergies generated are greater than the costs generated by the combination.

In its essence a mechanisms-based theory of diversification would argue that rather than looking for broad tendencies of "related businesses" to outperform unrelated ones or diversified firms to outperform focused ones, we should instead consider whether pairs or sets of activities or products that firms seek to combine when they diversify are mutually super-additive in value. If a diversification move, i.e. combining two products, businesses, or activities, is super-additive in value, only then should the scope expansion be undertaken. Value super-additivity between two activities and products could occur, for instance, through super-additivity in willingness to pay (i.e. consumption synergies) or sub-additivity in costs (i.e. production synergies) or some combination thereof.

The implications for future research of a mechanism-based approach

Given these various synergies and anti-synergies involved in diversification, one could now ask many different types of questions in different samples and settings. We suggest that using this approach to investigate the performance implications of diversification would have a

substantial impact on future research by leading to the uncovering of nuances of the problem that cannot be appreciated if diversification is treated in an aggregative fashion. For instance, the micro-mechanisms underlying a diversification move do not necessarily correlate and may even conflict with each other, leading to unclear predictions. As an example, one can think about the fact that horizontal operating synergies include the sub-mechanisms of brand and reputation spillovers as well as scope economies through sharing of inputs across businesses: a given diversification move could trigger conflicting effects in these two mechanisms, decreasing costs through sharing inputs but also destroying distinctiveness and willingness to pay and thus hurting brand value (see Table 5a).

Most of the existing studies do not account for the precise mechanisms of value-addition at play, and even when they do, they do not systematically explore or measure the *costs* of realizing the synergy or assess the extent to which these costs offset the benefits deriving from diversification. In our analysis we suggest that approaching the problem in this fashion would lead to insightful results. For instance, we note that the relative incidence of these costs differs across the different types of synergies (note how not all forms of synergies are subject to all forms of costs in Table 5b), raising the possibility that certain types of synergies that have been argued to provide relatively little benefit (e.g. financial synergies) relative to other forms of synergy (e.g. operating synergies) may yet fare no worse in their final effect on performance because they may also entail significantly lower costs. Indeed, as noted earlier, more recent findings in the finance literature have found evidence of a diversification premium, a possibility not inconsistent with the previous observation.

Why Now: New phenomena, New Theories, New Research Methods, New Data

We believe there are several reasons why this approach is particularly relevant at the present time. Specifically, we believe there are several sources of new energy in the area that were not

present earlier, i.e. factors that were not significant or available between 1980 and 1995 – the period when the diversification literature developed most significantly. We see four potential sources of new energy for work on diversification that we hope will be catalysts for future research in the area.

First, we note the preponderance of relatively new ways in which diversification is occurring today (i.e. *phenomenological catalysts*), resulting in visible and observable challenges to our understanding of diversification. For example, the widespread use of information and communication technologies has substantially increased connectivity and reduced coordination costs for firms and for individuals. For instance, companies like Google and Microsoft have expanded into many different markets where on the surface there seem to be relatively limited classical synergies. Companies like Uber are increasingly fashioning themselves as platforms, considering expansion into many markets. What are the boundaries to such scope expansion is currently not very clear. Similarly, globalization increasingly pits companies from emerging markets that come from business groups against relatively focused Western competitors providing us with an opportunity to study the diversification performance relationship more deeply and from new perspectives.

Second, we believe there are new *theoretical catalysts*, such as the developments in the literatures on complementarity and choice interdependencies, as well as the related analytic techniques that are providing a very significant way to both house the findings on diversification and synergies in a cohesive superstructure and probe the implications of diversification (e.g. Baldwin & Clark, 2000; Ghemawat & Levinthal, 2008; Levinthal, 1997; Milgrom & Roberts, 1990;1995; Porter, 1996; Siggelkow, 2002). These new developments in the analytic techniques that have emerged in the last decade to study complementarities also provide great potential for understanding diversification at the activity level – a level that has

not commonly been used but which is most meaningful if understanding and documenting synergies is a key goal of this research stream.

Third, diversification research has historically been bedeviled by endogeneity problems, as discussed in the earlier sections of this review. Addressing these endogeneity issues has been tricky. However, new *methodological catalysts*, i.e. recent advances in addressing endogeneity, offer the opportunity to gather novel insights on the problem. A variety of focused techniques have emerged ranging from propensity score analysis, regression discontinuity designs, matched control samples created through exogenous shocks etc. Note that for many of these analytic approaches it may be easier to develop a clean research design focusing on a narrower precision sample than to do a multi-industry broad sample.

Fourth, we see new *measurement and empirical catalysts*. The increasing use of technology, particularly the dramatic increase in online commercial interactions over the last decades (think about global marketplaces such Amazon that serve as a platform for other sellers to sell their products), has generated a substantial amount of new data (see for instance Oestreicher-Singer & Sundararajan, 2012; Stephen & Toubia, 2010; Zhu & Liu, 2014). This new data may potentially be used to measure the diversification of firms' product scope and may also be connected to other relevant information such as customers' product consumption choices and behavior. Although existing research on diversification has not fully adopted this approach yet, several recent studies that have started moving in this direction.

Conclusions and Future Research Directions

In this paper we have sounded a call for a new approach to the study of diversification. In sounding this call we are saying that the old approaches have served us well and established the dimensions of the phenomenon and its antecedents and consequences in many different ways. We now seek to re-characterize the problem in a fundamental way. Rather than simply

seek an answer to the D-P relationship puzzle in aggregate, we suggest a complementary path might be that of developing an understanding of the multiple, potential, synergies and anti-synergies that emerge from bringing together two sets of products or activities. To jumpstart this activity we catalogued some of the key synergies and anti-synergies already identified in prior research and articulated the key changes that the new paradigm of research would entail – i.e. focusing on *specific micro-mechanisms* underlying diversification, targeting *an outcome that is proximate* to the mechanism under investigation and *seeking a precision sample* where it might be found, all the while considering the possibility of both synergies and anti-synergies associated with the micro-mechanism.

The goal is that, over time, research will identify and established a full library of benefits and costs that can accompany a change in firm scope. Such a library could then be the basis of decision aids and tools to guide managers to create value-enhancing changes in firm boundaries. We also noted that this entire library could itself be the source of further research as scholars could look to understand relationships between types of synergies (e.g. under what conditions should production synergies be weighted more heavily than consumption synergies? Under what conditions do financial synergies make up for organizational attention costs in the context of diversifying into an unrelated business? Under what conditions do brand spillovers have a greater potential to be beneficial or harmful?).

More generally, we expect that such a research agenda will generate understanding about different types of synergies and anti-synergies. Following Simon (1962), we could, over time, organize these synergies into a hierarchy. For instance, one could argue that, over the course of the twentieth century, production or cost-side synergies were the common rationale for scope expansion. Classic illustrations of this were companies like Ford that were highly vertically integrated or General Motors, which built many different types of vehicles. In the twenty-first century, consumption synergies have increasingly become more important in affecting firm

scope. Consider Amazon, which has expanded from selling books, into all manner of products and is increasingly expanding into electronic devices, such as the Kindle, which share little with its core "production" skills but are critical from the perspective of consumption complementarity. This would suggest that production synergies sat atop the hierarchy in the twentieth century, but by the twenty-first century, consumption synergies became critical as well. Over time scholars could then identify the conditions under which all the various forms of synergies are most critical. This is the kind of knowledge accumulation that could occur.

Accumulating knowledge in this fashion can also provide a more focused and specific basis for assisting managers in making decisions. In the traditional aggregative approach our prescriptive guidance might be that "related diversification is useful". By going to the micro-mechanism level we can inform the managers that consumption synergies built around a brand extension are usually a net positive under the following conditions, x, y, z. Or that integrating consumption synergies built around superior experience for the customer is most useful under conditions a, b, c. More generally, we can advise managers to build their diversification strategy around clearly identified and reasoned bundles of synergies, while accounting for their costs, i.e. while specifically identifying those activities or products that are expected to deliver value super-additivity and explain why the costs of this integration are likely to be low.

Note that synergies can arise between activities or between products or between activities and products. But synergies can also be conditioned by the firm's external environment. For instance, in the emerging markets, capital-raising can be challenging without an existing reputation (Chittoor, Kale & Puranam, 2015; Khanna & Rivkin, 2001; Khanna & Palepu, 2000). In such a circumstance the financial synergy made possible in capital raising may swamp the "attention" costs of unrelated diversification. However, in other environmental contexts the synergies/anti-synergies payoff to combining such businesses may be different. Similarly, unrelated diversification (in the sense of uniting into a single-corporation-operating-

businesses with minimally correlated or negatively correlated cash-flows) may be more meaningful if one of the businesses is a very high-skill business. For a cyclical, high-skill business, cash flows from the unrelated business could provide financial flexibility and help avoid layoffs that may otherwise result in a serious loss of firm knowledge. Again evaluating the validity of this conjecture and the conditions under which the involved synergies/anti-synergies trade-off is positive remain to be tested.

We suggest that revitalizing existing research on corporate diversification could also serve as the basis of contributing to the lively debate on the relative importance of the transactions costs and the learning views to explain the boundaries of firms (Argyres & Zenger, 2012; Jacobides & Winter, 2005; Kogut & Zander, 1992). The recent technological changes provide an opportunity to investigate both these perspectives as drivers of diversification. In the last decade firms have been exhibiting very divergent diversification patterns. Some firms have been expanding their scope considerably (e.g. Amazon, Google, Microsoft, Apple), sometimes in vertical and sometimes in complementary or horizontal directions. Others are expanding scope in some directions (e.g. horizontal), but contracting it in others (e.g. vertical). Due to the significant advances in and widespread use of information technology to manage the coordination task, some firms have even emerged as "virtual corporations", which contract out most of their key activities. However, the knowledge-based view suggests that organizations exist and have differential boundaries because coordination is easier inside firms due to common routines, collective skills and norms (Kogut & Zander, 1992; Penrose, 1959). The recent dynamics raise several questions. For instance, does technology reduce coordination costs and hence expand the optimal scope of the firm, and if so, is the "diversification carrying capacity" of technology-centered firms fundamentally higher? Alternatively, does technology reduce transaction costs across markets even more than within firms so that the optimal scope of the firm is now reduced? Or most likely, are there conditions under which technology

increases the scope of the firm and others under which it decreases it, and what precisely are these conditions? Again, a micro-mechanisms approach could be helpful in identifying the various contingencies likely to be at play.

Perhaps one of the most interesting directions of future work may stem from questioning a long established premise of the diversification literature. The value of diversification has always been viewed from the perspective of the shareholder. Yet one might argue that, adopting a broader view of the firm and its responsibilities, one could ask how diversification affects the other stakeholders in a firm. Most importantly, given the capital structure of the typical American corporation and its leverage ratio, at any point in time the combined debt and external liability holders have almost as much of a stake in the company as the equity holders. Yet, little research, if any, has identified the implications of diversification for bond and other external liability holders. Extending diversification research to identify synergies and anti-synergies inherent in diversification from the perspective of such actors may be useful complements to existing research.

Indeed, an examination of some of the main effects of diversification suggests that even micro-mechanisms such as agency behavior by managers leading to over-diversification and destruction of shareholder value may create value from the bondholder's perspective by providing an additional cash flow stream to secure the debt-holder's interest in the company. Hence, the true total enterprise value effect (value of equity plus debt) of a given move may be quite different from what the very same diversification move may imply for stockholders alone. Examining this and related questions may provide a whole new perspective on diversification research. Preliminary steps have also been recently taken to investigate the relationship between corporate diversification and performance as part of a broader attempt to consider the potential distinction between different types of "owners" and different types of stakeholders of the firm. For example, David et al. (2010), distinguishing between the "relational" owners and

foreign “transactional” owners in Japanese corporations found that relational owners tend to prioritize growth versus profits from diversification. This suggests that the ownership structure of diversified corporations may influence the outcomes they seek to optimize. Other studies explicitly focus on the relationship between corporate diversification and corporate social performance (Kang, 2013; Mcwilliams & Siegel, 2001). Results show that diversification tends to have a positive impact of the social performance of firms, a relationship that is, however, negatively moderated by firm’s focus on short-term profits as measured by the firm’s return on equity (Hill, Hitt & Hoskisson, 1988; Kang, 2013). More generally, looking at the contributions of diversification to broader measures of social performance is an arena of great potential. Indeed, considering some of the opportunities that emerge over the last few pages, we think that this could yet be the dawn of a brave new world of research on firm scope and its performance consequences.

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TABLES

Table 1. The Diversification-Performance Relationship: Core Performance Pairs

Performance dimension, illustrative studies	Performance measure employed	Measure of diversification employed	Core findings on the relationship between diversification and performance
Profitability measures			
Rumelt, 1974, 1982	ROC and ROE	Hierarchical classification based on four major categories (i.e., single business, dominant business, related business, and unrelated business)	Related diversification outperforms unrelated
Christensen and Montgomery, 1981	ROIC	Rumelt	Performance differences exist between some (not all) of Rumelt's categories. Market characteristics are linked to those differences
Bettis and Hall, 1982	ROA	Rumelt	Performance differences mainly relate to industry differences
Lecraw, 1984	ROE relative to industry	Rumelt (modified)	Performance differences related to appropriate strategy, based on industry characteristics
McDougall and Round, 1984	ROA	Diversification dummy (questionnaire based)	Performance differences depending on economic period
Silhan and Thomas, 1986	ROA and ROC	Simulated mergers	Related diversification is a necessary but not sufficient condition for firm performance
Dubofsky and Varadarajan, 1987	ROA	Classification into low, medium, and high diversification (Michel and Shaked, 1984)	No significant difference in performance between strategies
Johnson and Thomas, 1987; Keats and Hitt, 1988	ROE	Rumelt	No significant difference in performance between strategies
Grant and Jammine, 1988	ROE, RONA, ROS	Wrigley and Rumelt	Diversified firms outperform specialized firms. No difference between related and unrelated diversification
Capon et al., 1988	ROC	Rumelt (modified)	Given the level of diversification, concentrating in one market improves performance

Performance dimension, illustrative studies	Performance measure employed	Measure of diversification employed	Core findings on the relationship between diversification and performance
Amit and Livnat, 1988	FFTOA = Funds from operations at year t / Total assets at year t-1; NITA = Net income at year t / Total assets at year t-1	Pure financial diversification	Diversified firms had generally lower profits that undiversified firms
Nguyen, Seror, and Devinney, 1990	Profits to equity	Berry Herfindhal measure	Related diversification is significantly related to firm's profitability, no effect when market share and industry concentration are controlled for
Simmonds, 1990	ROA	SIC-based	On average, related firms higher performers than unrelated firms on ROA but not on ROE, ROIC, and SGR
Robins and Wiersema, 1995	ROA	Portofolio interrelationships measure	Corporations with more highly interrelated business portfolios outperform firms with lower levels of portfolio relatedness
Mayer and Whittington, 2003	ROA	Rumelt	Related-constrained diversification is positively associated with firm performance
Risk-adjusted returns			
Dubofsky and Varadarajan, 1987	Sharpe's (1996); Treynor's (1965) levered and unlevered measures, Jensen's (1968) alpha	Rumelt	Unrelated diversifiers are better performers than related diversifiers
Lubatkin and Rogers, 1989	Jensen (alpha)	Rumelt	Greater performance for constrained diversifiers
Excess value			
Montgomery and Wernerfelt, 1988	Tobin's q	Caves' concentric index	Negative association
Lang and Stulz, 1994	Tobin's q	(1) Number of segments; (2) revenue-based Herfindhal index; (3) asset-based Herfindhal index	Negative association
Servaes, 1996	Tobin's q	Number of 2-digit codes	From negative to no effect in different time periods

Performance dimension, illustrative studies	Performance measure employed	Measure of diversification employed	Core findings on the relationship between diversification and performance
Berger and Ofek, 1995, 1996	Percentage difference between the firm's total value and the sum of imputed values for its segments as standalone entities	Firms with more than one segment, sales above 20 million USD, and no segments in the financial service industry	Negative association (smaller for related diversifiers)
Denis, Denis, and Sarin, 1997	Percentage difference between the firm's total value and the sum of imputed values for its segments as standalone entities	(1) fraction of firms with multiple segments; (2) number of segments; (3) number of 4-digit SIC codes; (4) revenue-based Herfindhal index; (5) asset-based Herfindhal index	Limited evidence of value loss
Rajan, Servaes, and Zingales, 2000	Percentage difference between the firm's market value and a portfolio of single-segment firms in the same 3-digit industry (asset-weighted average to compute industry averages)	Firms with multiple segments	Discount contingent on the diversity in resources and opportunities among divisions
Whited, 2001	Tobin's q	Firms with multiple segments	No significant difference between multi segment and single segment firms after accounting for measurement error in Tobin's q
Klein, 2001	Tobin's q	Firms having made at least three acquisitions, with more than 20% increase in total assets and involvement in ten or more 3-digit SIC categories or five or more 2-digit categories	Discount varies over time period: conglomerates as good performers in the 1960s but not in the 1970s

Performance dimension, illustrative studies	Performance measure employed	Measure of diversification employed	Core findings on the relationship between diversification and performance
Lamont and Polk, 2001	Excess value; i.e., Tobin's q and market-sales ratio of the firm	Firms with more than one segment, sales above 20 million USD, and no segments in the financial services industry	Discount dependent on the level of expected cash flow and expected returns of the corporation
Campa and Kedia, 2002	Log of the ratio of firm value to its imputed value (i.e., if each of its segments operated as single-segment firms)	Firms with more than one segment, sales above 20 million USD, and no segments in the financial services industry	No evidence of discount once the endogeneity of the diversification decision is taken into account
Graham, Lemmon, and Wolf, 2002	Percentage difference between the firm's total value and the sum of imputed values for its segments as standalone entities	Firms with more than one segment, sales above 20 million USD, and no segments in the financial services industry	Diversification discount originated by the fact that acquired units are priced at significant discount when acquired
Mansi and Reeb, 2002	Percentage difference between the firm's total value and the sum of imputed values for its segments as standalone entities	(1) Dummy of firms with multiple segments; (2) Number of different segments in which firms operate	Discount disappears when controls for leverage and risk are introduced
Dittmar and Shivdasani, 2003	Percentage difference between the firm's total value and the sum of imputed values for its segments as standalone entities	Firms with multiple segments	Negative association and the discount diminishes after divesture
Gomes and Livdan, 2004	Tobin's q	Dummy of firms with multiple segments	Negative
Miller, 2006	Tobin's q	Technological diversity (based on breadth of patent stock)	Positive relationship between related diversification and firm performance

Performance dimension, illustrative studies	Performance measure employed	Measure of diversification employed	Core findings on the relationship between diversification and performance
Risk			
Bettis and Hall, 1982	ROA standard deviation	Rumelt	Not significant after taking industry effects into account
Hill, 1983	Volatility (% change in ROS, ROK, or share price)	Conglomerate (firms for which the largest single business ratio + related ratio is less than 0.4 and unrelated ratio is greater than 0.4)	Conglomerates more volatile than non-conglomerate over the economic cycle
Montgomery and Singh, 1984	Systematic risk (beta)	Rumelt	Betas for unrelated diversifiers are significantly higher compared to those of other firms
Bettis and Mahajan, 1985	ROA standard deviation	Rumelt	Different diversification strategies can result in similar risk return performance
Silhan and Thomas, 1986	Mean absolute percentage error (forecast error)	Conglomerate	Forecast error decreases as the number of segments increases (conglomeration as an effective risk-reduction strategy)
Lubatkin and O'Neill, 1987	Systematic risk (beta)	FTC classification of mergers	Systematic risk declines more in the case of related diversifiers than in the case of unrelated mergers
Lubatkin and O'Neill, 1987	Unsystematic risk	FTC classification of mergers	All mergers are associated with significant increase in unsystematic risk
Lubatkin and O'Neill, 1987	Total risk	FTC classification of mergers	Total risk declines in related mergers
Barton, 1988	Systematic risk (beta)	Rumelt	Unrelated diversifiers have higher systematic risk
Amit and Livnat, 1988, 1989	Operating risk (cash-flow variability)	Pure financial diversification / efficient corporate diversification	Pure financial diversified firms have lower operating risk
Lubatkin and Rogers, 1989	Systematic risk (beta)	Rumelt	Constrained diversification (unrelated diversification) associated with lower (higher) systematic risk
Chatterjee and Lubatkin, 1990	Systematic risk (beta)	FTC classification of mergers	Related mergers induced a downward shift in the systematic risk for related bidders; unrelated mergers appear to be effective at reducing stockholders' risk
Growth			

Performance dimension, illustrative studies	Performance measure employed	Measure of diversification employed	Core findings on the relationship between diversification and performance
Weston and Mansinghka, 1971	Sales growth, Total assets growth, Net income growth	Firms having made at least three acquisitions, with more than 20% increase in total assets and involvement in ten or more 3-digit SIC categories or five or more 2-digit categories	Conglomerates outperform other firms in growth measures
Palepu, 1985	Profit growth	Jacquemin-Berry entropy measure	Firms with predominantly related diversification display significantly better profit growth than firms with predominantly unrelated diversification.
Capon et al., 1988	Sales growth	Rumelt (modified)	Diversified-unicategory firms outperformed diversified-bicategory firms on sales growth and diversified-bicategory-single-group firms outperformed diversified-bicategory firms on sales growth
Zahavi and Lavie, 2013	Sales growth	Intra-industry Herfindhal	Intra-industry diversity generates a U-shaped performance effect
Innovation			
Nelson, 1959	Incentive to invest in basic research	Conceptual	Diversified firms have higher incentives to invest in basic research
Scherer, 1965	Number of patents	Industry count	Diversification correlated with inventive output, but diversification mostly accounting for industry differences
Cardinal and Opler, 1995	Number of new products	Relatedness ratio (proportion of a firm's employees in its largest 2-digit SIC business)	No statistical effect of diversification on innovative efficiency
Stimpert and Duhaime, 1997	R&D expenditures	Entropy measure	Higher levels of diversification associated with lower levels of R&D expenditures
	Investment in R&D	Wrigley	Related and unrelated firms invest less in R&D than dominant business firms; no significant difference between related and unrelated diversifiers
Miller, Fern, and Cardinal, 2007	Patent's impact	Interdivisional self-citations	The use of interdivisional knowledge positively affects the impact of an invention on follow-ups technological developments

Performance dimension, illustrative studies	Performance measure employed	Measure of diversification employed	Core findings on the relationship between diversification and performance
Ahuja, Lampert, and Tandon, 2014	Direction of research effort (investment in paradigm-changing technologies)	Relatedness across businesses	The more related a firm's businesses are, the larger its investments into paradigm-changing technologies and the smaller its investments into paradigm-deepening technologies
Wu, 2013	New product introduction	Diversification dummy (more than one market)	Diversification is associated with a performance decrease in the current market
Novelli, 2015	Patent scope (Number of patent claims, number of patent classes)	Hall et al. (2001) classification	Related diversification in a firm's knowledge base is associated with a higher number of patent claims and a lower number of patent classes in the firm's patents, suggesting that related diversification might increase firms' ability to identify variations and further applications to their inventions, but it might also decrease the extent to which such variations are spread across technological domains
Survival			
Mitchell and Singh, 1993	Survival	Expansion into new subfields (dummy)	Incumbents that expand into new technical subfields survive longer
Lange, Boivie, and Henderson, 2009	Failure rate	Entropy measure	Firms diversifying into a new industry give birth to subsidiaries that are weaker survivors

Table 2. Main Contingencies Affecting The Diversification Performance Relationship

Contingent variable	Illustrative studies	Core findings
Characteristics of the industry/market in which a firm operates and the businesses in which a firm diversifies		
Industry profitability	Wernerfelt and Montgomery, 1986	Efficient diversifiers do better the more profitable their industries, whereas inefficient diversifiers prosper in less profitable environments
Concentration in one market area (consumer vs. industrial)	Capon et al., 1988	Different markets require different skills for success; hence, concentrating in one market area at given levels of diversification improves performance
Business cycles	Lubatkin and Chatterjee, 1991	The relationship between relatedness and performance is contingent on the business cycle
Novelty of the field in which the firm enters	Mitchell and Singh, 1993	Entering new fields can provide economies of scope, scale, and learning as well as financial and R&D advantages. However, it can also increase the risk of exit due to the negative consequences of a potential failed expansion
Industry lifecycles	Davis and Thomas, 1993	As industry matures, production synergies get eliminated by dissimilarities on other dimensions
Variance in R&D intensity and capital intensity across the line of business of diversified firms	Harrison, Hall, and Nargundkar, 1993	Similarities across the lines of business reflect corporate strategic consistency, which may lead to superior corporate performance
Similarity of the accumulated assets	Markides and Williamson, 1994	Related firms outperform unrelated ones when they compete across a portfolio of markets where similar types of accumulated assets are important
Diversity in resources and opportunities	Rajan, Servaes, and Zingales, 2000	Diversity in resources and opportunities across divisions is associated with resource misallocation and lower performance
Similarity between rivals in terms of market structure correspondence	Li and Greenwood, 2004	Multi-market behaviours are associated with superior performance
Environmental change created by the dynamic of other firms in the industry	Stern and Henderson, 2004	The relationship between within-business diversity and survival is contingent on the amount of environmental change generated by the diversification and innovation dynamics of a firm's competitors themselves
Industry characteristics (number of diversified competitors and combined market share of specialized firms)	Santalo' and Becerra, 2008	Diversified firms have a better performance in industries (1) characterized by a small number of nondiversified competitors or (2) in which specialized firms have a small combined market share
Centrality of conglomerate compared to specialized firms	Anjos and Fracassi, 2015	High-excess-centrality conglomerates have greater value, especially in industries covered by fewer analysts and where soft information is important

Contingent variable	Illustrative studies	Core findings
Financial constraints and economic conditions	Kuppuswamy and Villalonga, 2016	Diversification provides financial and investment advantages that are particularly valuable in the context of a financial crisis
Characteristics of firms		
Organizational structure	Chang and Choi, 1988	Business groups that have a multidivisional structure show superior economic performance because such structure reduces transaction costs
Organizational structure	Hoskisson, Harrison, and Dubofsky, 1991	The market reacts positively to diversified firms being organized using M-form, especially for unrelated diversifiers
Organizational structure	Hoskisson, Hitt, and Hill, 1991	Limited diversification supported by appropriate controls (i.e., M-form) induces managerial risk taking, whereas high levels of diversification or extensive interdependence between divisions reduces managerial risk taking
Organizational arrangements within M-form; i.e., centralization/decentralization, integration, use of subjective and objective evaluation criteria, incentive schemes based on corporate profitability	Hill, Hitt, and Hoskisson, 1992	Related diversification has the potential to realize economic benefits from economies of scope, whereas unrelated diversification has the potential to realize economic benefits from governance economies. Accordingly, these two forms of diversification need appropriate organizational arrangements that enable this potential
Organizational structures that enable resource sharing and performance	Markides and Williamson, 1996	Diversification short- and long-term advantages are conditional on organizational structures that allow the firm's division to share assets
Organizational structure of R&D research centers	Cardinal and Hatfield, 2000	Firm with a separate research center will have higher levels of patent productivity than firms without a separate research center; this effect is greater for focused firms than for diversified firms
Organizational structure (number of subsidiaries)	Klein and Saidenberg, 2010	Firms with many subsidiaries are less profitable than firms with fewer subsidiaries
Compensation strategy	Gomez-Mejia, 1992	Compensation strategies affect the implementation of diversification and, in doing so, affect performance
Managerial incentives	Aggarwal and Samwick, 2003	The link between firm performance and managerial incentives is weaker for firms that experience changes in diversification than it is for firms that do not
Managerial policies to maintain organizational slack	Gary, 2005	Successful diversification strategies are associated with managerial policies that maintain organizational slack
Level of IT investment and performance	Chari, Devaraj and David, 2008	Investment in information technology helps firms sharing and transferring resources and capabilities across businesses; it is more relevant for related diversifiers than for unrelated ones

Contingent variable	Illustrative studies	Core findings
Level of IT investment and performance	Ray, Xue, and Barney, 2013	Information technology capital enables firms with narrowly (broadly) valuable assets to be less (more) vertically integrated and less (more) diversified
Security analyst ratings of voluntary disclosure	Bens and Monahan, 2004	Positive association between the excess value of diversification and security analyst ratings of voluntary disclosure
Segment disclosure	Franco, Urcan, and Vasvari, 2016	The negative relation between industrial diversification and bond yields becomes stronger when firms improve segment disclosures
Debt level	O'Brien et al., 2014	Firms returns from leveraging their resources and capabilities into new markets are enhanced when managers are shielded from the rigors of the market governance of debt, particularly bond debt
Relationship with secondary stakeholders and performance	Su and Tsang, 2015	By serving as agents mitigating external constraints, secondary stakeholders positively moderate the relationship between product diversification and performance
Search strategy	Kim et al., 2013	A related diversification strategy leads to greater innovation when the firm employs the appropriate technological strategy
Firm life cycle	Arikan and Stulz, 2016	The value creation performance of acquiring firms varies throughout firms' lifecycle. For older firms, the acquisition of public firms is associated with negative stock price reactions
Characteristics of the diversification move		
Diversification mode (internal vs. external)	Lamont and Anderson, 1985	No significant difference
Diversification mode (internal vs. external)	Simmonds, 1990	No strong results but unrelated external diversification is associated with the worst performance
Match between diversification strategy and diversification mode (internal versus external)	Busija, O'Neill, and Zeithaml, 1997	The type of strategy chosen and the diversification mode reinforce each other
Diversification motive i.e., risk avoidance	Hill and Hansen, 1991	Diversification motivated by risk avoidance does not have a positive effect on profitability measures and in fact, due to the costs it involves, it has a negative effect on it; instead, it leads to risk reduction
Diversification motive (diversification oriented acquisitions and consolidation-oriented acquisitions) and industry cycle	Anand and Singh, 1997	Consolidation-oriented acquisitions outperform diversification-oriented acquisitions in the decline phase of their industries in terms of both ex ante (stock market based) and ex post (operating) performance measures
Type of relatedness; i.e., production vs. marketing (performance, ROA vs. sales growth)	Davis et al., 1992	Different types of functional relatedness affect different performance measures: high production relatedness affects ROA, while high levels of marketing relatedness positively affect sales growth

Contingent variable	Illustrative studies	Core findings
Type of relatedness; i.e., product relatedness vs. managerial relatedness	Ilinitch and Zeithaml, 1995	Businesses in the same vertical stage of the value chain are more similar to manage than those in different stages
Complementarity across different types of synergies	Tanriverdi and Venkataraman, 2005	Synergies arising from product-knowledge-, customer-knowledge-, or managerial-knowledge-relatedness do not improve corporate performance on their own, but they do so when they complement each other
Type of relatedness (production and consumption) and performance (sales growth and market share)	Tanriverdi and Lee, 2008	In the presence of network externalities, complementarity between related diversification in production and consumption leads to the achievement of positive returns to within-industry diversification
Entry and exit directed by knowledge applicability	Chang, 1996	Entry and exit directed by similarity in human resource profiles contribute to the improvement of firms' profitability
Type of diversification (intraindustry and interindustry) and complexity	Barroso and Giarratana, 2013	Within-niche product proliferation generates learning curves and positive synergies between a brand and a submarket niche, which expire after a certain level due to cannibalization

Table 3 Methodological Concerns Affecting the Diversification-Performance Relationship

Core issue and illustrative studies	Core findings
Measurement (diversification)	
Montgomery, 1982	Comparison between SIC-based count measures and categorical measures of diversification. High convergence between the two types of measures is found. The high efficiency of SIC-based count measures is noted
Pitts and Hopkins, 1982	Comparison between business-count versus category- based measures. Business count measures appear to be more suitable for research comparing diversified and non-diversified firms but not for explaining the difference among diversified firms
Chatterjee and Blocher, 1992	Comparison of convergent and predictive validity of Rumelt's categorical classification and continuous measures of diversification (Herfindhal, weighted and entropy indexes). Not strong convergent validity of Rumelt's measures. Good discriminating power of continuous measures between Rumelt's measures
Hoskisson et al. 1993	Comparison between Rumelt's categorical measure of diversification and continuous approaches (SIC count, entropy). Results suggest that while using both Rumelt and entropy measures improves the accuracy of the study, using either of the two measures should still lead to acceptable results
Lubatkin, Merchant & Srinivasan, 1993	Comparison between Rumelt's categorical measure of diversification and continuous approaches. Results reveal high degree of correspondence between the narrow (4-digit) and broad (2-digit) spectrum measures of diversification and Rumelt's categorical measures
Hall and St. John, 1994	Comparison between Rumelt's categorical measure, continuous measures (product count and entropy) and continuous scores converted to strategy categories. Results report a close association between the three types of measures, but different performance predictions
Robins and Wiersema, 2003	Comparison in terms of content validity between the related component of the entropy index and the concentric index as measures of relatedness. The results suggest that they are sensitive to the characteristics of corporate portfolio composition that may not be directly linked to portfolio relatedness.
Measurement (relatedness)	
Ahuja, Lampert & Tandon, 2013	Relatedness measured based on common inputs
Farjoun, 1994; Mahoney & Pandian, 1992; Peteraf, 1993; Teece,1977; 1982	Relatedness measured based on skills and capabilities
Matusik and Fitza, 2003; Miller, 2006; Robins & Wiersema, 1995; Silverman, 1999; Tanriverdi & Venkataraman, 2005	Relatedness measured based on technologies and knowledge assets
Chatterjee & Wernerfelt, 1991; St. John & Harrison, 1999	Relatedness measured based on physical assets
Capron & Hulland, 1999	Relatedness measured based on distribution channels or product markets
Measurement (performance)	
Bergh, 1995	Diversification is positively related to performance when data are pooled, averaged and tested cross-sectionally; different association when tested over time
Whited, 2001	Measurement error in q can explain the diversification discount

Villalonga, 2004	Measurement of performance based on segment data can lead to distorted results and be the origin of the diversification discount
Confounders of the relationship between diversification and profitability	
Scherer, 1965	Industry effects as confounders (the two- or three- digit industry groups with high patenting activity tend to host firms highly diversified)
Bettis, 1981	Industry effects as confounders (most related diversifiers operate in high-performing industries)
Christensen and Montgomery, 1981	Market structure as confounders (most related diversifiers in more profitable, highly growing and highly concentrated markets and most unrelated diversifiers experience low profitability, low concentration and low market share in their markets and this makes them more likely candidates for unrelated diversification)
Bettis and Hall, 1982	Industry effects as confounders
McDougall and Round, 1984	Economic period as confounders (diversification is associated to outperformance in periods of fluctuating economic activity)
Keats and Hitt, 1988	Environmental instability as confounders (environmental instability tends to reduce both the level of diversification and the operating performance)
Chang and Thomas, 1989	Risk-return characteristics and market power of markets served by a diversified firm as confounders (market effects have the most impact on the profitability of diversified firms)
Lamont and Polk, 2001	Discount firms have higher leverage then premium firms suggesting that leverage is a potential confounder of the relationship
Park, 2003	Industry effects as confounders (related acquirers were in more profitable industries than unrelated acquirers, prior to acquisition)
Custodio, 2014	Accounting policies as confounders (diversification discount are biased upward by the accounting implications of mergers and acquisitions)
Form of the relationship	
Hoskisson and Hitt, 1990	Curvilinear relationship between diversification and performance
Markides, 1992	Curvilinear relationship between diversification and profitability
Lubatkin and Chatterjee, 1994	Curvilinear relationship between corporate diversification and risk: diversification into similar businesses is superior in terms of risk minimization than that into identical or very different businesses
Palich, Cardinal and Miller, 2000	Curvilinear relationship between diversification and performance (accounting- and market-based : moderate levels of diversification lead to higher levels of performance than either limited or extensive diversification)
Matusik and Fitza, 2012	U-shaped relationship between diversification of knowledge assets and performance (IPO success rate of VC investments): superior results are associated with either low or high levels of diversification, while moderate levels yield lower results
Zahavi and Lavie, 2013	U-shaped relationship between intra-industry product diversity and performance (sales growth): increases in product diversity initially undermine performance (due to negative transfer effects) but then improve it (due to the increase in economies of scope)
Hashai, 2015	S-shaped relationship between intra-industry diversification and firm performance (ROS)
Direction of causality and self-selection	
Rumelt, 1974, 1982	Firms may be seeking diversification to escape their poor industries or poor performance

Dubofski and Varadarajan, 1987	Performance might affect how a firm chooses to diversify
Grant, Jammine and Thomas, 1988	Causation between product diversification and profitability is weak in both directions
Lang and Stulz, 1994	Firms that choose to diversify are poor performers compared to firms that don't
Campa and Kedia, 2002	Strong negative correlation between a firm's choice to diversify and firm value
Park, 2003	Related acquirers more profitable in their industries than unrelated acquirers, prior to acquisition
Gomes and Livdan, 2004	Diversification is often the result of bad productivity shocks
Miller, 2004	Diversifying firms invest less in R&D and have greater breadth of technology prior to diversification. Also, acquiring firms appear to have lower performance due to accounting policies. Firms using internal growth rather than acquisition pursue less extensive diversification
Miller, 2006	Diversification and performance are endogenously related through a variety of mechanisms
Levinthal and Wu, 2010	Firms with superior capabilities in a low-value existing markets context diversify to increase their profits, but this is associated with lower average return due to the spread of non-scale free capabilities across applications
De Figueiredo and Rawley, 2011	When managers require external investment to expand, the discipline of markets ensures that higher-skilled firms will be more likely to diversify
Wu, 2013	More capable firms operating in markets characterized by higher demand maturity are more likely to diversify because they experience higher opportunity costs

TABLE 4 Theoretical Perspectives Underlying Synergy-Seeking Diversification

Core theoretical perspectives addressing the phenomenon	Illustrative studies	Core assumptions/logic	Types of synergies / anti-synergies that are identified by this theoretical perspective
Resource-based view	e.g. Markides and Williamson, 1996; Penrose, 1959; Robins and Wiersema, 1995; Wan, Hoskisson, Short, Yiu, 2011	Building on Penrose (1959) the resource-based view suggests that firms diversify in order to use their excess capacity of resources that have multiple uses but that are subject to market failure (Peteraf, 1993; Teece, 1982; Montgomery & Wernerfelt, 1988; Wernerfelt, 1984). Diversification enhances performance by allowing firms to get access to assets that are strategic and that would not otherwise be available through the market (Markides & Williamson, 1996)	Horizontal operating synergies (see Table 5a) and anti-synergies (see Table 5b)
Transaction costs economics	e.g. Arrow, 1974; Jones and Hill, 1988; Williamson, 1975	Firms diversify in other businesses (vertically related or horizontally related) if the internalization reduces the transaction difficulties that are associated to market exchange (Jones and Hill, 1988). For instance moral hazard, opportunism and information asymmetries between interacting businesses may be reduced as a result of diversification	Vertical operating synergies (see Table 5a) and anti-synergies (see Table 5b)
Strategic behavior	e.g. Baum and Greve, 2001, Baum and Korn, 1999; Li and Greenwood, 2004)	Diversification occurs because coordinating strategies across markets provides competition related benefits	Strategic synergies (see Table 5a) and anti-synergies (see Table 5b)
Financial theories of risk reduction and information efficiency	e.g. Lewellen, 1971	Diversification provides opportunities to reduce risks that cannot be accessed by individual shareholders acting on their own and to exploit information economies	Financial synergies (see Table 5a) and anti-synergies (see Table 5b)

TABLE 5a Mechanisms: Synergies

Type of synergy	Sub-mechanisms	Illustrative studies
Horizontal operating synergies: benefits that emerge from sharing assets or activities across businesses	• Economies of scale and scope originating from the sharing of common core resources or activities across businesses that do not transact with each other, across time or over time • Economies of learning: reduction of average variable cost as cumulative production increases or product improvements due to advances in R&D in one business, which may be transferred across related businesses • Convenience or cost savings for customers and information economies that emerge from providing multiple products to a customer segment leading to willingness to pay complementarities	e.g. Amit and Livnat, 1988; Bettis, 1981; Bettis and Hall, 1982; Cardinal and Opler, 2009; Chatterjee, 1986; Clark and Huckman, 2012; Farjoun,1998; Grant and Jammine, 1988; Helfat and Eisenhardt, 2004; Hitt, Hill and Hoskisson, 1992; Jones and Hill 1988; Karim and Kaul, 2014; Mahoney and Pandian, 1992; Markides and Williamson, 1994; Mitchell and Singh, 1993; Montgomery and Wernerfelt, 1988; Palepu, 1985; Penrose, 1959; Porter, 1987; Prahalad and Bettis, 1986; Puranam & Vanneste, 2016; Rumelt, 1974; 1982; Sakartov and Folta, 2014; Seth, 1990; Tanriverdi and Venkataraman, 2005; Teece 1980;1982; Wringley, 1970; Ye, Priem and Alshwer, 2012; Zenger, 2016
Vertical operating synergies: benefits that arise from conducting activities from successive stages of a value chain within the same company	• Coordination benefits: Better coordination between stages of production reducing costs or improving the quality of the ultimate product. • Opportunism benefits: Countering the opportunism of buyers or suppliers	e.g. Arrow, 1974; Hill and Hoskisson, 1987; Jones and Hill, 1988; Klein, Crawford and Alchian, 1978; Williamson, 1975

Strategic synergies: benefits that arise from coordinating strategies across markets	• Multi-market contact benefits: benefits related to the implicit coordination with the firm's competitors and eventually to mutual forbearance and reduced competition as well as opportunity to increase barriers to entry (caveat – potentially illegal!) • Cross-subsidization and predatory pricing: Firms with multiple businesses and cash-flow streams may use cash generated through one business to cross-subsidize another business thus giving the second business an advantage in its market and possibly engage in predatory pricing (caveat – potentially illegal!) • Market power benefits: Increase in market power via increase in size and reputation	e.g. Amit and Livnat, 1988; Baum and Greve, 2001, Baum and Korn, 1999; Chatterjee, 1986; Li and Greenwood, 2004; Lubatkin, 1983; Lubatkin and Rogers, 1989; Karnani and Wernerfelt, 1985; Markham, 1973; Meyer, Milgrom, and Roberts, 1992; Puranam & Vanneste, 2016; Scherer, 1980
Financial synergies: benefit that arise from the co-location of two businesses and their correspondent cash-flows and decision-making activities within the same legal enterprise	• Risk-reduction benefits: If the cash-flows of the individual businesses are negatively correlated, the firm can realize "safer" cash flows (co-insurance) and decreased bankruptcy risk as well as obtain taxation benefits, increased debt capacity • Information economies: Firms could be run as internal capital market with headquarters having the ability to access the accounts of the individual businesses and thus be more efficient in its deployment of capital than entities that are outside the corporation and do not enjoy such preferential access to the accounts of the businesses. • Tax savings: Present value of tax savings on losses written off immediately across businesses	e.g. Amit and Livnat, 1988; Chatterjee, 1986; Dimitrov and Tice, 2006; Gopalan and Xie, 2011; Hill, Hitt and Hoskisson, 1992; Lewellen, 1971; Levy and Sarnat, 1970; Lintner, 1971; Lubatkin and O'Neill, 1987; Lubatkin and Rogers, 1989; Mitchell and Singh, 1993; Montgomery and Singh, 1984; Seth, 1990; Scott, 1977; Williamson, 1975

TABLE 5b: Mechanisms: Anti-synergies

Type of anti-synergy	Sub-mechanisms	Illustrative studies
Horizontal and vertical operating costs or anti-synergies: costs that arise from sharing assets or activities across businesses or from conducting activities from successive stages of a value chain within the same company	• Coordination costs: costs that arise due to the coordination required to share resources across businesses and that relates to the complexity of organizing the use of resources among multiple actors/units and the costs of increases in communication and decisional activities required to do so	Hashai, 2015; Hill and Hoskisson, 1987; Jones and Hill, 1988; Keren and Levhari, 1983; Gary, 2005; Rawley 2010; Zhou, 2011
	• Opportunity costs of resources: costs related to the fact that at any point in time resources need to be allocated among alternative, competing, activities including opportunity costs of not investing in scale in existing markets and attention costs related to over-extended scientists, engineers and managers (related to the fact that congestion creates bottlenecks, which lead human resources to spend less time on each individual tasks reducing the thoroughness and overall quality of work and decision making over time)	Helfat and Eisenhardt, 2004; Gary, 2005; Hill and Hansen, 1991; Levinthal and Wu, 2010; Levy and Sarnat, 1970; Mitchell and Singh, 1993; Penrose, 1959; Rosen, 1982; Sakhartov and Folta, 2015; Slater, 1980; Teece, 1982 Wu, 2013; Zenger, 2016
	• Administrative or bureaucratic costs: costs related to the inefficiencies that increase in organizational size and complexity tend to create, including loss of scale, increased operating leverage, loss of efficiency due to captive customers/ suppliers, limits to exploration as well as control and effort losses from potential increase in employees shirking	Calvo and Wellisz, 1978; Hill and Hansen, 1991; Jones and Hill, 1988; Lubatkin, 1983; Sutherland, 1980; Penrose, 1959; Puranam & Vanneste, 2016;Williamson, 1975; Zenger, 2016
	• Adaptation costs/ adjustment costs/ organizational rigidity costs: costs of adapting the resource, routines and practices that are used in existing businesses to additional businesses, including the costs of inappropriate response in contexts characterized by a different logic, and the costs of inappropriate planning due to the overestimation of the similarity of different businesses	Hashai, 2015; Leonard- Barton, 1992; Lubatkin and O'Neill, 1987; Kaplan and Henderson, 2005; Prahalad and Bettis, 1986; Puranam & Vanneste, 2016; Rawley, 2010
	• Learning and absorptive capacity costs: costs that emerge from the inefficiencies related to learning about the new contexts	Chavas, 2011; Markides, 1992; Markides, 1995; Penrose, 1959; Kumar, 2009
	• Compromise costs: related to the choice of development of more generic inputs or assets with the purpose of increasing their usability across applications but leading to an undercut of its possible value addition in any specific usage. Such costs may also emerge from the overestimation of similarities between businesses and the potential of the firm to benefit by sharing resources between them	Harrison, Hall and Nargundkar, 1993; Hill and Hoskisson, 1987; Lubatkin, 1983; Markides and Williamson 1994; Porter, 1980; Wernerfelt and Montgomery, 1988; Zahavi and Lavie, 2013; Zenger, 2016

Strategic costs or anti-synergies: costs that arise from coordinating strategies across markets	• Contagion costs: decline in the value of a brand in one product category (for instance by an accident) that results in declines in the value of that brand for other product categories as well	Greenwood et al. 2005; Natividad and Sorenson, 2015; Puranam & Vanneste, 2016
Financial costs or anti-synergies: costs that arise from the co-location of two businesses and their correspondent cash-flows and decision-making activities within the same legal enterprise	• Conflict costs: costs related to the non-optimization of the investment decisions and of the inefficient allocation of capital among different units due to the internal power struggles generated by diversification as well as agency and influence behavior	Hoskisson and Hitt, 1988; Jensen, 1986; Jensen and Meckling, 1976; Kumar, 2013; Lyandres, 2007; Meyer, Milgrom, and Roberts, 1992; Rajan, Servaes, Zingales, 2000; Scharfstein and Stein, 2000; Stulz, 1990
	• Information and control costs: costs related to the inefficiencies due to executives information processing limits as the span of control of corporate executives as well as the differences among divisions increases	Berger and Ofek, 1995; Chavas, 2011; Hitt, Hill and Hoskisson, 1992; Hoskisson and Hitt, 1988; Hoskisson, Hitt and Hill, 1993; Markides, 1992; Markides, 1995; Myerson, 1982; Harris, Kriebel, and Raviv, 1982; Williamson, 1967

FIGURES
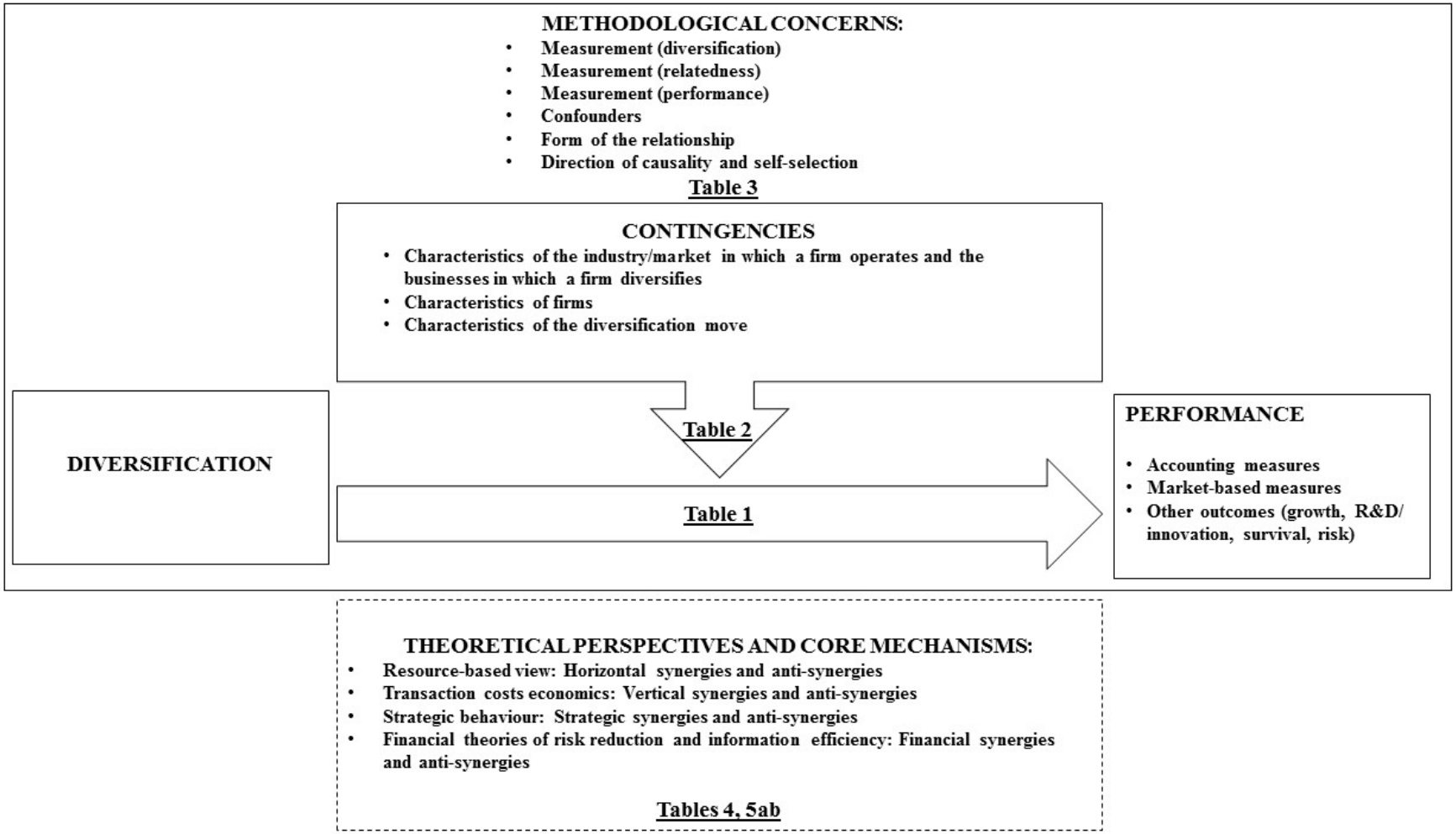
Figure 1 Structure of the Review