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Does the Diversification–Firm Performance Relationship Change Over Time? A Meta-Analytical Review

Monika Schommer, Ansgar Richter and Amit Karna

EBS University of Business and Law; University of Surrey; Indian Institute of Management Ahmedabad

ABSTRACT We study the relationship between diversification and firm performance in the context of the decline in levels of diversification over time. We argue that the pressure to reduce diversification may have more strongly affected those firms whose diversification strategies were most detrimental to firm performance. We employ meta-analytical regression (MARA) in order to test our hypotheses, using a total of 267 primary studies containing 387 effect sizes based on 150,000 firm-level observations from over 60 years of research on the diversification–firm performance relationship. The findings suggest that levels of unrelated diversification have decreased, whereas levels of related diversification have increased since the mid-1990s, following an initial decrease in the 1970s and 1980s. Furthermore, we find that the relationship between unrelated diversification and firm performance has improved significantly over time, whereas the relationship between related diversification and performance has remained relatively stable.

Keywords: diversification, corporate refocusing, firm performance, meta-analysis

A widely shared view in the strategic management literature that has permeated leading textbooks on corporate strategy (Hitt et al., 2017; Johnson et al., 2008) holds that the relationship between corporate diversification and firm performance is inverted U-shaped (Pierce and Aguinis, 2013; Rumelt, 1974). According to this view, small diversification steps, in particular into lines of business that are related to a firm's existing one(s), tend to have benefits (e.g., from sharing factors across different business lines) that outweigh their disadvantages. However, as firms diversify into further and less related lines of business, the marginal benefits of doing so decline and the marginal costs increase, such that above its optimal level the effects of diversification on performance begin to

Address for reprints: Ansgar Richter, Surrey Business School, University of Surrey, Rik Medlik Building, Guildford, Surrey, GU2 7XH, United Kingdom (a.richter@surrey.ac.uk).

turn negative (Markides, 1995).[1] A large number of empirical studies, including several meta-analyses, have attested to this view (e.g., Palich et al., 2000).

Little is known, however, about the effects of the 'refocusing' that is reported to have taken place in recent decades (Bergh et al., 2008) on the nature of the diversification–firm performance relationship. According to agency-theoretic (e.g., Kogut et al., 1992; Montgomery, 1994) and institutional (e.g., Lee et al., 2008; Wan, 2005; Wan and Hoskisson, 2003) perspectives, increasing shareholder power, a more active market for corporate control, and a liberalized market environment have curbed the ability of managers to pursue potentially value-destroying conglomeration strategies. These developments have led to the 'de-institutionalization' of the conglomerate form in the late 1980s and early 1990s in the US (Davis et al., 1994; Fligstein and Markowitz, 1993; Lichtenberg, 1992). In some other Western countries, a trend towards de-diversification also appears to have taken place (Whittington and Mayer, 2000), albeit at a slower pace. With respect to emerging economies, the picture is less clear. Lee et al. (2008) and Peng et al. (2005) argued that with increasing institutional development, the relative benefits of diversification have decreased, and its relative costs increased. Some studies have found that, as a result, aggregate levels of diversification among emerging market firms have decreased (Hoskisson et al., 2005). At the same time, diversification continues to be an important strategy for many companies in markets such as India (Ramachandran et al., 2013) and others.

Much of the empirical evidence on diversification is based on data gathered during the 1980s and 1990s. However, there is little evidence on whether the trend away from diversification that appears to have taken place during that time has continued since then. The number of studies that have investigated *long-term* trends in diversification (over several decades) is relatively small. There is thus value in aggregating what is known from primary, cross-sectional 'snapshots' of levels of diversification, and mapping them over time. Furthermore, many of the extant studies on changes in diversification do not distinguish between related and unrelated diversification.

Against this background, our paper makes two contributions to the literature on corporate diversification. First, we analyse the development of diversification over time, distinguishing between related and unrelated forms of diversification. Our study is more nuanced than extant research, by showing that the trends in related and unrelated diversification have been different. We apply meta-analysis in order to aggregate studies on diversification, and model these data as a function of time. Our study covers over 60 years of research, a longer time period than any other quantitative study on levels of diversification.

Second, we investigate shifts in the diversification–performance relationship in the context of the changes in levels of diversification over time. This research interest is not merely an exploratory one, but has important theoretical implications. Specifically, authors including Mackey et al. (2017) have argued that the capacity to manage diversification is heterogeneously distributed across firms. They thus conceive the performance effects of diversification not as an absolute value, as does the discussion about the diversification discount or premium in the finance literature (Campa and Kedia, 2002; Kuppuswamy and Villalonga, 2010; Rajan et al., 2000), but rather as a variable that differs between firms. Building on this view, we propose that environmental pressures to de-diversify have been greatest for those firms whose diversification strategies were particularly detrimental to value creation and performance. Our argument implies that, while overall levels of diversification have declined over time, the *average* performance effect of diversification (among the fewer firms that continued to diversify) may have become more positive (or at least less negative). By taking predominantly cross-sectional perspectives on 'slices' of the diversification–performance relationship, extant research has paid little attention to the shift in the nature of this relationship (Benito-Osorio et al., 2012; Lee et al., 2008). Our work redresses this limitation, thus challenging the view that the diversification–performance relationship is *inherently* inverted U-shaped.[2] We apply meta-analytical regression analysis (MARA) to a total of 267 primary studies containing 387 effect sizes and over 150,000 firm-level observations from over 60 years of research on the diversification–firm performance relationship.

DIVERSIFICATION AND ITS RELATIONSHIP WITH FIRM PERFORMANCE

Conceptual Foundations

Diversification is defined as a strategy that a firm pursues when operating in different product or service markets simultaneously (Ansoff, 1957). Corporate diversification emerged on a broad scale in the 1960s as a popular strategy especially among U.S. firms (Markides, 1995). Following the work of some early observers of the diversification phenomenon (Gort, 1962), researchers began to study diversification more systematically in the 1970s and 1980s (e.g., Channon, 1971; Dyas and Thanheiser, 1976; Geroski and Jacquemin, 1984; Rumelt, 1974). The industrial organization literature assessed diversification primarily in terms of its effects on competition (Li and Greenwood, 2004). Finance and strategic management researchers have been interested primarily in the consequences of diversification for firm-level performance outcomes, specifically capital market and accounting performance.

Strategic management scholars have argued for an inverted U-shaped relationship between levels of diversification and firm performance (Rumelt, 1974). The benefits of diversification include risk reduction; the cross-utilization and exploitation of resources, such as managerial skills, talent and time; operational capabilities; physical and informational resources; and reputation (Chatterjee and Wernerfelt, 1991). The common use of resources leads to economies of scale (by using particular production factors more fully) and scope (through the sharing of factors across business lines) (Helfat and Eisenhardt, 2004; Prahalad and Bettis, 1986; Prahalad and Hamel, 1990). According to Markides (1995), the marginal benefits of diversification decrease with increasing levels of diversification. Firms are likely to exploit their resources (such as product- or customer-specific knowledge) in the first-best opportunity, such that returns from diversification into further (and more remote) lines of business are likely to decline.

At the same time, scholars have argued that the marginal costs of diversification are an increasing function of the level of diversification, because its disadvantages (e.g., greater coordination and integration costs) tend to grow disproportionately with increased diversification (Grant et al., 1988; Hashai, 2015; Markides, 1992; Markides and Williamson, 1994). Diversification creates costly complexity (Zhou, 2011), and internal information asymmetries increase with the degree of diversification, because bounded rationality constrains management's ability to process heterogeneous information from different lines of business (Markides, 1995; Williamson, 1967). As a result of decreasing marginal benefits and increasing marginal costs, diversification is widely seen to have an inverted U-shaped relationship with firm performance (Amit and Livnat, 1988; Lubatkin and Rogers, 1989; Markides, 1995; Pierce and Aguinis, 2013; Rumelt, 1974). Existing meta-analyses in this area (Bausch and Pils, 2009; Palich et al., 2000) provide evidence that is consistent with this inverted U-shaped relationship between diversification on the one hand, and accounting and market performance on the other.

The level of diversification is often equated with the degree of relatedness, such that firms with a smaller (larger) number of businesses are likely to be more related (unrelated) diversifiers than those with a larger (smaller) number of businesses. In this study, we adopt this practice, following the approach taken in prior meta-analyses in this field (e.g., Palich et al., 2000). Relatedness can be defined in multiple ways (e.g., resource-based, capabilities-based, market-based), but is widely measured as relatedness between product or service markets (Markides and Williamson, 1994; Nocker et al., 2016). In contrast to unrelated businesses, related ones tend to share common firm-specific assets (Li and Greenwood, 2004; Stern and Henderson, 2004; Tanriverdi and Lee, 2008) and to give rise to resource complementarities (Ennen and Richter, 2010). As Klein and Lien (2001) note, the rationales for related and for unrelated diversification differ fundamentally, with the former delivering advantages either through substitutability or complementarities between resources, and the latter delivering advantages through the greater relative efficiency of internal versus external capital markets and other finance-related advantages (e.g. risk-spreading) (e.g., Mueller, 1969; Trautwein, 1990).

Finance scholars have argued that due to inefficient internal capital markets, firms may diversify at the cost of performance and firm value (Lamont, 2002; Shin and Stulz, 1998). Following Jensen and Meckling's (1976) seminal article, many authors have also pointed to the managerial agency costs associated with diversification (e.g., Jensen, 1986; Jensen and Murphy, 1990; Shleifer and Vishny, 1991; Stulz, 1990). The performance effects of diversification can be attributed to the way in which diversified firms allocate resources, often biased towards good opportunities in case of related diversifiers, and towards poor opportunities in more highly diversified firms (Rajan et al., 2000). As a result, stock markets tend to put a diversification discount on conglomerate stocks (Ammann et al., 2012; Berger and Ofek, 1995; Comment and Jarrell, 1995; Denis et al., 2002; Hoechle et al., 2012; Lang and Stulz, 2010; Servaes, 1996).

However, a number of studies in the finance literature have cast doubt on whether the relationship between diversification and value is *inherently* negative (Klein, 2001). Several authors (Campa and Kedia, 2002; Chevalier, 2004; Graham et al., 2002; Villalonga, 2001) have suggested that the diversification discount observed in the capital market results from selection effects, because discounted firms self-select into pursuing diversification strategies. Using different methodologies, some studies even report a small diversification premium (Campa and Kedia, 2002; Hund et al., 2012; Kuppuswamy and Villalonga, 2010). More recently, Volkov and Smith (2015) and Rudolph and Schwetzler (2014) have found that the relative value of diversified firms increases during recessionary periods, because their capacity to use internal capital markets provides them with advantages over more focused firms (see also Gopalan and Xie, 2011; Matvos and Seru, 2012). This research thus suggests that the effects of diversification may vary over time, due to economic conditions and other environmental factors.

In sum, two main insights emerge from our review of the strategy and the finance literatures on the diversification–firm performance relationship. First, the traditional view has been that the effect of diversification on firm performance is inverted U-shaped, such that low levels and related types of diversification have positive firm performance consequences, whereas high levels and less related types of diversification strategies have negative performance effects. Extant meta-analyses in this area have attested to this view (Bausch and Pils, 2009; Palich et al., 2000). However, there is considerable variation in the performance effects of both related and unrelated diversification across firms (Rumelt, 1974). Furthermore, more recently authors have challenged the established view; specifically, they have cast doubt on whether higher levels and unrelated types of diversification are *necessarily* detrimental to performance. Second, there is no complete agreement with respect to whether the strength of any effects of (related or unrelated) diversification on performance have changed over time. The answer to this question appears to be subject to methodological choices and the type of performance measure used. Furthermore, both temporal factors and the institutional environment in which the diversification–performance relationship is studied appear to play a role (Lee et al., 2008; Wan and Hoskisson, 2003). Against this background, we now discuss the effects that environmental pressures have had on levels of diversification, and on its relationship with performance.

Changes in Diversification Levels Over Time

Empirical research suggests that diversification among large US firms has decreased since the late 1970s or early 1980s (Chandler, 1990; Johnson et al., 2008). According to Basu (2010), this development slowed down during the 1990s and the early years of the new century. In the UK, the trend towards de-diversification is reported to have taken place in the late 1980s and the 1990s (Davies and Petts, 1997), in particular during the 1991/92 recession (Geroski and Gregg, 1997). With respect to other countries, the evidence is more mixed. Some authors report a reduction in diversification among companies in several European countries (Whittington and Mayer, 2000). In Germany, however, changes in corporate diversification appear to have been small (Richter and Owen, 1997). For the 1987–1993 period, Davies and Petts (1997) even report an increase in diversification among German companies. In many emerging economies, average levels of diversification remain high due to the presence of integrated business groups (Khanna and Palepu, 2003; Khanna and Rivkin, 1997; Ramachandran et al., 2013), although some studies suggest a gradual trend towards de-diversification in some of these countries (Hoskisson et al., 2005).

The 'refocusing' literature suggests that changes in diversification in the US and the UK are the result of both firm-specific and environmental factors (Johnson et al., 2008). In terms of the latter category, three inter-related sets of forces help to explain the decline in levels of diversification between the late 1970s and the mid-1990s. First, changes in factor markets, specifically a general shift in the balance of power from managers towards shareholders (Kochan and Useem, 2010; Useem, 1993), and other capital market pressures, have curbed the ability of managers to engage in managerial empire building (Hope and Thomas, 2008). Diversification strategies may help managers to maximize their own utility at the expense of shareholders (Shleifer and Vishny, 1989). More well-developed and efficient external capital markets are more likely to penalize firms through share price discounts that, in turn, raise the likelihood of takeover (Hoskisson and Turk, 1990; Shleifer and Vishny, 1991). External governance mechanisms have complemented internal ones in forcing managers to pursue value maximization strategies (Aguilera et al., 2015).

Second, greater competition in product markets has forced firms to focus on those lines of business where they have the clearest advantage over competitors (Peteraf, 1993; Teece, 1980), rather than to compete on scale by acquiring firms in other lines of business. According to Hoskisson and Hitt (1994), over-diversification was one of the contributing factors to the decline in competitiveness in the US in the 1970s. As global competition from countries such as Japan and Germany increased, US companies were forced to 'downscope' their businesses, in order to regain competitiveness.

Third, changes in the institutional environment – i.e., greater deregulation, privatization and capital market liberalization – favoured reduced diversification (Lee et al., 2008). For example, deregulation in the US (e.g., in communications, energy, and transportation) and a more lenient interpretation of restrictions on acquisitions in the same line of business (e.g., Sherman Act of 1890 and Clayton Act of 1914) encouraged firms to invest in existing lines of business rather than diversify (Harford, 1999; Opler et al., 1999). In emerging economies, the gradual development of the institutional environment has also begun to close 'institutional voids' (Khanna and Palepu, 2000) that diversified corporate structures can fill. In their study of diversification in six Asian countries, Chakrabarti et al. (2007) found that diversification improved performance only in the least developed economies, but became detrimental to performance with increasing institutional development. Similarly, Guillen (2000) argued that the value of the capabilities involved in managing diversified business groups, such as the capability to repeatedly enter new industries, is contingent on inefficiencies in the external environment in which these firms operate. Overall, the value of internalizing transactions in diversified companies, relative to the reliance on market transactions, may have decreased over time (Bhagat et al., 1990).

To summarize, beginning in the US, from the 1970s onwards a number of changes have taken place in the institutional and economic environment in which firms operate, which have affected the relative advantages and disadvantages of corporate diversification strategies. The environmental pressure towards greater de-diversification should have affected in particular those firms with higher levels of diversification (i.e., unrelated diversifiers) to start with, than firms with low levels and more related forms of diversification. As a result, overall levels of diversification should have declined over time. In sum, we argue:

Hypothesis 1: Overall levels of diversification have decreased over time.

Changes in the Diversification–Performance Relationship Over Time

We propose that environmental pressures have led firms to select more value-creating diversification strategies and avoid value-destroying ones, thus leading to an improvement in the aggregate relationship between diversification and firm performance. Our argument is based on the central conviction underlying strategic management theory that firms differ from one another in terms of their resources and capabilities (Barney and Arikan, 2001; Hansen et al., 2004). According to this view, the capacity to manage diversification is heterogeneously distributed across firms (Mackey et al., 2017). Some firms will be more successful than others in managing a particular degree of diversification, given their underlying resource endowments (Barney, 1991; Chatterjee and Wernerfelt, 1991), capabilities (Adner and Helfat, 2003; Teece, 2007), or as a result of other firm characteristics (Rumelt, 1991).

Empirical research is consistent with the notion that firms differ considerably in terms of their ability to manage diversification (Amit and Livnat, 1988; Klein and Lien, 2001). Some highly diversified firms outperform their focused yet otherwise similar competitors (Campa and Kedia, 2002; Kuppuswamy and Villalonga, 2010). Scholars have identified a range of factors that affect a firm's optimal degree of diversification, including ownership (George and Kabir, 2012) and organizational structure (Klein and Saidenberg, 2009).

The choice of the optimal diversification strategy will thus be endogenously determined (He, 2009). Firms will select the level and type of diversification that best matches their capabilities, resources, and other firm-specific factors, and thus produces better performance outcomes relative to alternative diversification strategies (see Gomes and Livdan, 2004, and Maksimovic and Phillips, 2002 for similar arguments). However, the effectiveness of this mechanism is contingent on the strength of the selection environments in which firms operate (McKelvey and Aldrich, 1983). Weak selection environments allow firms to "overdiversify" (Markides, 1992) – i.e., to pursue diversification strategies that are inconsistent with profit maximization. In contrast, increasing capital market pressures (Hoskisson and Turk, 1990) and greater product market competition (Hoskisson and Hitt, 1994) will force firms to choose a level and a type of diversification that is associated with optimal performance. For example, Santalo and Becerra (2008) showed that with increasing competition among specialized firms in an industry, diversified firms lost their prior performance advantage. Therefore, with increasing competition, firms will adapt their diversification strategies to performance-optimal levels.

We thus argue that the environmental pressures discussed above have affected not only overall *levels* of diversification, but also the *relationship* between diversification and firm performance, as a result of both negative and positive selection processes. Comparing firms with a given level of diversification but heterogeneous resource and capability endowments (Barney, 1991; Teece, 2007), the pressure to reduce their degree of diversification should have been strongest for those firms that were least capable of managing their diversification in a value-enhancing manner. Given an active market for corporate control (Hitt et al., 1996), firms with particularly value-destructive diversification strategies will have been forced to de-diversify (e.g., through spin-offs or sell-offs; see Bergh et al., 2008); otherwise, they may have left the population of firms through takeover and subsequent break-up, or through decline and exit (Daley et al., 1997). In contrast, firms with greater capacities to manage diversification successfully, and thus with better performance, should have had greater likelihood of survival (Pennings et al., 1994). Increasing environmental pressures thus imply that the incidence of firms with diversification above their performance-optimal levels will have declined.

Therefore, assuming that empirical samples adequately represent the structure of the economy (or a particular subset thereof, such as the group of the largest firms in a country), the average strength of the association between performance and diversification should have increased over time, because fewer firms were able to diversify above their performance-optimal level. Over time, samples of diversified firms in a given economy should thus contain a larger proportion of firms with positive performance consequences. As a result, the aggregate (mean) performance effect of diversification will have improved. Therefore, we hypothesize that:

Hypothesis 2: The relationship between diversification and firm performance has become more positive over time.

Moreover, we argue that stronger selection environments will discriminate more clearly between firms with higher levels (i.e., unrelated forms) of diversification, than between firms with lower levels and more related types of diversification. The pursuit of unrelated diversification strategies is easily observable to external parties. If firms with unrelated diversification strategies are perceived as underperforming, they often come under pressure to reduce their diversification through divestment or demerger (Hamilton and Chow, 1993; Haynes et al., 2000), or otherwise become subject to takeover (Berger and Ofek, 1996). As a result, the performance consequences of unrelated diversification among the fewer remaining firms pursuing this strategy will have become better because firms with greater capacities to manage unrelated diversification should have faced less pressure to de-diversify (Mackey et al., 2017). Changes in the external environment reduce the relative advantage of using internal capital markets. Therefore, only those unrelated diversifiers that rely on more firm-specific, inimitable sources of diversification advantages (e.g., superior managerial competencies, business models with a strong dominant logic (Prahalad and Bettis, 1986)) will have remained in the game. In contrast, changes in the external environment are less likely to affect resource complementarities – which are prevalent among related lines of business – because they are internal to the firm (Ennen and Richter, 2010). Therefore, the average strength of the relationship between related diversification and performance will be less affected by environmental forces. We thus propose that:

Hypothesis 3: The relationship between unrelated diversification and firm performance has improved more over time than the relationship between related diversification and firm performance.

DATA AND METHODS

We used two sets of meta-analytic regression analyses (MARA; Lipsey and Wilson, 2001) in order to examine the development of diversification levels over time and test our hypotheses regarding the influence of time on the diversification–performance relationship. Research questions investigating the development of a phenomenon over time are ideal for meta-analysis, because this method exploits variations across the settings of different primary studies (Aguinis et al., 2011; Geyskens et al., 2009).

Data

We followed a comprehensive three-step process to establish our database of primary studies. First, we used the primary studies from existing meta-analyses and literature reviews (Bausch and Pils, 2009; Benito-Osorio et al., 2012; Carney et al., 2011; Lee et al., 2008; Palich et al., 2000; Pils, 2009; Schüle, 1992). Second, we searched the ESBCO abstracts of articles published in the 50 leading business, finance, economics and management journals by SSCI impact factor for the terms 'perform*', 'value' or 'discount' in combination with the terms 'diversif*' or 'conglomerat*'. In step three, we applied the same search algorithm to the OATD database of dissertations. We also collected several additional studies that were cited in the literature review sections of the primary studies from steps one to three. This approach resulted in 1199 studies. We then screened these studies as to whether they reported at least one useable correlation-based or partial correlation-based effect size (or the necessary data to compute it) between firm performance and diversification, and dropped those studies that did not. Our final sample consisted of 267 studies comprising 387 effect sizes. Our sample is substantially larger than any of the previous samples in the meta-analyses by Schüle (1992) (44 studies), Palich et al. (2000) (55 studies) and Bausch and Pils (2009) (104 studies). Out of the 267 studies, more than half have not been included in any of the previous meta-analyses. Our sample comprises studies published between 1962 and 2016, and data collected between 1950 and 2011 (Appendix 1).

Measures

Dependent variables. In our test of Hypothesis 1, the dependent variable was the level of diversification, measured either as the arithmetic mean of the Herfindahl index, or as the Entropy index (related or unrelated components, or their sum). The Herfindahl index is defined as $\sum_{i=1}^{n} p_i p_i$ where p_i is the share of a company's revenue in product i with respect to its overall revenue (Jacquemin and Berry, 1979). The Herfindahl index takes a value of 0 for a perfectly diversified firm and a value of 1 for a firm with only one product. The Entropy index is defined as $\sum_{i=1}^{n} p_i \, ln \frac{1}{p_i}$, where p_i is the share of a company's revenue in business line i with respect to its overall revenue, and $ln\left(1/p_i\right)$ is the logarithmic weight for each business line i (Jacquemin and Berry, 1979). The Entropy index takes a value of 0 for a firm with only one business line, and has no upper limit. We did not combine these two measures of diversification because they use different scales (and in this analysis, we were interested in the absolute value of these measures rather than their correlations with performance).

In our second set of analyses used to test Hypotheses 2 and 3, we ran meta-analytic regression analysis using effect sizes of the relationship between (related, unrelated, and overall) diversification and (various measures of) performance as dependent variables. Effect sizes were calculated on the basis of either product-moment correlations or partial correlations (Becker and Wu, 2007). We obtained correlations between diversification and performance from correlation tables reported in primary studies. In many cases where product-moment correlations were not reported, we were able to transform other reported data such as means and standard deviations, t-values, F-values, and p-values, into product-moment correlations, using the methods provided by Lipsey and Wilson (2001).

The diversification measure underlying the product-moment correlations had to relate to the level of product (or service) diversification (as opposed to, for example, international diversification). Measurement of diversification included Rumelt's categories, his specialization and related ratios (Rumelt, 1982), Herfindahl (Hirschman, 1964) and Entropy (Jacquemin and Berry, 1979) indices and industry count measures (Montgomery, 1982). We coded the correlations for related, unrelated, and total diversification separately (e.g., Jacquemin and Berry, 1979).

We included correlations when they were based on one of the performance constructs followed by Palich et al. (2000): growth (sales growth, earnings growth), profitability (return on assets, return on equity, return on sales, return on investment), risk-adjusted market returns (Jensen, Treynor, and Sharpe ratios) or unadjusted market value (market-to-book value, Tobin's q). We also included excess value in the unadjusted market value category, in line with studies in the finance literature that often use this performance measure.

In those cases where a primary study did not provide product-moment correlations, we used partial correlations as our effect size measure (for this approach, see van Essen et al., 2013). Partial correlations were computed as $r_p = \frac{t}{\sqrt{t^2+df}}$, where t is the t-statistic and df relates to degrees of freedom (Greene, 2008). The use of t-statistics for aggregating partial correlations is a relatively simple approach, yet it makes more realistic demands on data availability than alternative methods, which often require raw data, covariance matrices, or other information not available in the context of our investigation (Becker and Wu, 2007).

When multiple measurements of the diversification–performance relationship were reported, we included all relationships in our analysis. Monte Carlo simulations have shown that procedures using the complete set of measurements outperform alternative procedures (Bijmolt and Pieters, 2001).

We applied appropriate corrections for statistical artifacts to each correlation (Hedges and Olkin, 1985; Hunter and Schmidt, 1990). First, we corrected for artificial dichotomization in the variables underlying the diversification–performance correlations (Hunter and Schmidt, 1990). For example, this was the case if a study reported point-biserial correlations between two Rumelt (1982) categories (single-business firms vs. related-diversified firms) as dichotomized diversification variable, and a continuous performance variable. The dichotomization of diversification is artificial because the underlying construct of diversification is of a continuous nature. These correlations suffer from downward distortion of at least 20 per cent (in the case of a 50-50 split between the observations of the two diversification groups, see Hunter and Schmidt, 1990; Lipsey and Wilson, 2001). In order to correct for this bias, we multiplied the original correlations by a factor of $\frac{\sqrt{PQ}}{\Phi(c)}$, where P and Q are the split proportions of the observations in the two groups ($Q = 1 - P$), c is the cutoff score which splits the standardized normal distribution into proportions P and Q, and $\Phi(c)$ is the normal curve ordinate for the cutoff score c (Hunter and Schmidt, 1990).

Second, in order to make the diversification values comparable to one another, we reversed the product-moment correlations in which the underlying diversification or performance variable used reverse-scaled values. This was often the case when diversification was measured by the Herfindahl index (Hirschman, 1964) or Rumelt's specialization ratio (Rumelt, 1982), such that low values represented high diversification and high values represented low diversification (e.g., Bethel and Liebeskind, 1993). After the recalculation, a high value denoted a high diversification level. Reverse scaling was not an issue for studies using the Entropy index.

Third, we transformed the correlations using Fisher's z-coefficients (Hedges and Olkin, 1985). The z-transformed effect size is defined as $\mathrm{ES}_{z_r} = .5\,ln\left(\frac{1+r}{1-r}\right)$, where r is the unstandardized correlation coefficient (Lipsey and Wilson, 2001). The z-transformation is a standard procedure in meta-analyses to account for undesirable statistical properties[3] of correlations (Lipsey and Wilson, 2001) and to normalize the distribution of the effect sizes (Rosenthal, 1991).

Independent variables. Our main independent variable of interest was the time at which a primary study on diversification (and its performance effects) was carried out. For each study, we defined the variable *median year of data collection* as the median year between the first and the last year of observations used in that study (Carney et al., 2011). If the count of years was an even number, we used the mean of the two middle years. For five studies which did not report the time period of their observations (Hoskisson et al., 2004; Mackey and Barney, 2013; Narasimhan and Kim, 2002; Oyewobi et al., 2013; Tanriverdi and Venkatraman, 2005), we used the year three years prior to the publication date. In order to study the development of the effect size over time, we created separate samples if the time span of observations covered more than one decade. Five studies in our sample reported such observations (Grant and Jammine, 1988; Kaul, 2003; Lubatkin and Rogers, 1989; Mayer and Whittington, 2003; Servaes, 1996).

Furthermore, in order to test Hypothesis 3, we used dummy variables to distinguish between related, unrelated, and overall diversification, where overall diversification includes both related and unrelated components. We coded these three dummy variables (related, unrelated and overall diversification) for each sample based on the diversification measure underlying the diversification–performance correlation. We followed the authors' definition of related and unrelated diversification unless it deviated from the convention that unrelated diversification is measured across 2-digit SIC industry groups and related diversification is measured across 4-digit SIC industry groups within a 2-digit SIC industry group (Jacquemin and Berry, 1979), or their equivalents in non-US countries.

Control variables. We took into account a range of substantive and methodological controls. First, the diversification–performance relationship could be affected by a country's environment beyond its financial, legal and labor market institutions. To account for country-level differences, we controlled for *country size*, measured in terms of its total population. Furthermore, we used *GDP per capita* (expressed in constant 2005 US dollars) to control for a country's level of economic development. These macroeconomic indicators are frequently used in cross-country studies and together also measure market size (Chakrabarti, 2001; Christmann et al., 1999; Fauver et al., 2003; Papageorgiadis et al., 2013; Qian et al., 2010, 2013). We also controlled for the level of *physical infrastructure* by counting the number of fixed telephone subscriptions per 100 people. Carney et al. (2011) used a similar measure to account for potential voids in physical infrastructure. All three measures are taken from the World Development Indicators database (World Bank, 2015). For each study in our sample, we used the value of the respective control variable for the same year as the median year of data collection of the study.

Furthermore, we included *country group* dummies to account for unobserved institutional and socio-economic differences between countries. We defined three dummies for country groups, which relate to the country underlying the firm-level sample of each primary study or sample. The reference category is comprised of Anglo-American countries (USA, UK, Australia, Canada and New Zealand). *Country group 1* takes a value of 1 for European countries and Japan, and 0 otherwise. *Country group 2* takes a value of 1 for all other countries (primarily developing countries), and 0 otherwise.

Second, we used a range of methodological controls. To account for differences in journal quality, we controlled for *journal impact factor*, defined as the SSCI (Social Sciences Citation Index) average impact factor score for the years 2012 to 2014. We assigned a value of 0 to unpublished work and publications not covered by the SSCI index. Next, we controlled for the samples that used Fortune 500 firms by including a dummy variable. Furthermore, a dummy variable *longitudinal design* indicated whether the primary study used a longitudinal (1) or a cross-sectional (0) design. We also controlled for studies from where we obtained partial instead of full correlation coefficients by adding a dummy variable *partial correlation* that took the value of 1 when partial coefficients were used. We controlled for studies that used an SIC-based diversification measure, by adding a dummy variable. Next, we treated the accounting performance constructs (growth and profitability) and the capital market performance constructs (risk-adjusted market returns and unadjusted market value) as separate samples in order to control for inherent differences in measures of performance, following Palich et al. (2000). We therefore defined a dummy variable for the *capital market performance measure* that took the value of 1 for capital market performance and 0 for accounting performance. Finally, we controlled for *lack of independence in effect sizes* by including a dummy that took the value of 1 for those effect sizes that were not independent, i.e. those that came from samples that reported multiple effect sizes. These or similar control variables are commonly used in meta-analytical research (Carney et al., 2011; Heugens et al., 2009; Karna et al., 2016).

Analytical Approach

In order to test Hypothesis 1, we regressed the arithmetic mean of the diversification level on time (*median year of data collection*) as a predictor variable (see Lipsey and Wilson, 2001, pp. 40–1). We ran different models for the Herfindahl index of total diversification, the Entropy index of total diversification and the related and unrelated components of the Entropy index, respectively.[4] To calculate the optimal weight for each study, we obtained the standard deviation of the mean diversification level from the primary studies' summary statistics (Lipsey and Wilson, 2001).

For testing Hypotheses 2 and 3, we regressed the *sample effect size* (i.e., correlations between diversification and performance) on a battery of sample and country characteristics as independent variables. We repeated this analysis using the mean performance effects of related, unrelated and overall diversification as dependent variables. In the regressions, we accounted for differences in precision due to the number of observations in each of our samples by weighting the effect sizes by the inverse variance of the effect size using formula provided by (Hedges and Olkin, 1985; Lipsey and Wilson, 2001). Samples with more observations thus carry greater weight than samples with fewer observations. Because we are interested primarily in between-study variance, while controlling for the fact that multiple effects from the same study are not independent of one another, we chose the random-effects over the fixed-effects model (Geyskens et al., 2009; Lipsey and Wilson, 2001).

In order to provide further evidence on how the mean performance effects of diversification changed across time periods, we also used Hedges–Olkin-type meta-analysis (HOMA) to calculate mean effect sizes (Geyskens et al., 2009; Hedges and Olkin, 1985; Lipsey and Wilson, 2001). We employed Stata macros including those by Wilson (1998) to carry out our MARA and HOMA analyses.

RESULTS

We used MARA in order to analyse changes in diversification levels over time, where the *level of diversification* serves as a dependent variable and time (*median year of data collection*) as an independent variable. Table 1 presents the results for different indices of diversification. Total diversification is measured with both the Herfindahl (Model 1) and the Entropy (Model 2) indices. Additionally, related (Model 3) and unrelated (Model 4) diversification are measured with the Entropy index. We chose these indicators over alternative diversification measures, such as count-of-industries, because a greater number of studies reported them. In order to ascertain the shape of the relationship between time and diversification, we compared outputs from linear, quadratic and cubic model specifications, reporting in Table 1 those models that displayed optimal fit. We ran all

Table I. Development of diversification over time

	Dependent variable: Level of diversification			
Models	1	2	3	4
Variables	*Herfindahl Index of Diversification*	*Entropy Index of Total Diversification*	*Entropy Index of Related Diversification*	*Entropy Index of Unrelated Diversification*
Constant	1.524** (0.357)	1.331** (0.406)	8.797** (2.801)	1.156* (0.411)
Median year of data collection [a]	−0.202** (0.071)	−0.119 (0.076)	−3.408** (1.155)	−0.148[†] (0.079)
Median year of data collection squared [a]			0.341** (0.117)	
Adj. R^2	0.22	0.02	0.21	0.11
K	29	57	27	21
$Q_{Residual}$	4653.14 (0.000)	27937.20 (0.000)	13179.51 (0.000)	5356.09 (0.000)
F	8.16 (0.008)	2.41 (0.126)	4.396 (0.024)	3.51 (0.077)
Chibar2	4461.32 (0.000)	27571.57 (0.000)	13011.88 (0.000)	5249.56 (0.000)

K = number of effect sizes; *Q* = Cochran's homogeneity test statistic (with its probability in parentheses below). *F* = overall model fit (with its probability in parentheses below)
[a]Deflated by a factor of 10.
[**]$p < 0.01$; [*]$p < 0.05$; [†]$p < 0.10$
Standard errors of regression coefficients in parentheses.

of these models also with control variables, namely *journal quality* (SSCI index) and *GDP per capita* (as a measure of country development). The results did not differ materially from those reported below, hence for reasons of parsimony we chose not to include them in Table 1.

All models except for the one represented in Model 2 explain a sizeable amount of the variation in diversification levels, with R^2-values between 0.11 and 0.22, and F-values significant at $p < 0.05$. Regardless of measurement, the coefficient on the *median year of data collection* variable carried a negative sign in all models. The decline is significant at $p < 0.01$ for samples that measure diversification with the Herfindahl index of total diversification (Model 1).

When the Entropy index of total diversification was used, the coefficient on the median year of data collection variable was negative, but did not reach statistical significance (Model 2). In order to explore this result further, we disaggregated the analysis by distinguishing between related and unrelated diversification. For related diversification (Model 3), we find evidence of a U-shaped development of related diversification over time ($p < 0.01$ for both the linear and the quadratic regression coefficients). According to the model, levels of related diversification declined in the late 1970s and the 1980s to reach their minimum in 1995, in order to rise again thereafter.

Levels of unrelated diversification, in contrast, appear to have declined over time in a linear fashion, and this decline was statistically significant, albeit only weakly so ($p < 0.1$) (Model 4). These diverging developments thus explain why the decline in overall levels of diversification as measured by the Entropy index (Model 2) was not statistically significant: Whereas levels of unrelated diversification appear to have declined continuously, levels of related diversification appear to have declined until around 1995 before increasing again, thus leading to no significant change in overall diversification when measured by the Entropy index.[5]

In sum, the results provide partial support for Hypothesis 1 according to which levels of diversification have decreased over time. Considering the significant decline in diversification when measured by the Herfindahl index (Model 1), and the conflicting developments with respect to diversification when measured by the Entropy indices of related and unrelated diversification (Models 3 and 4), the decline in overall diversification appears to have come primarily from the reduction in unrelated diversification, whereas firms appear to have seen an increase in related diversification, following an initial decrease.

We then conducted MARA in order assess the effect of time on the strength of the relationship between related, unrelated and overall diversification and firm performance (Table 2). All three regression models include two sets of controls, and were highly significant ($p < 0.01$). First, we included a battery of methodological controls, as detailed above. Few of these were statistically significant. The *journal impact factor* variable proved to be statistically significant in Models 2 and 3, however, with an inconsistent result: Whereas in Model 2, which focuses on the performance effects of related diversification, *journal impact factor* had a positive and significant effect, in Model 3, which uses the performance effects of unrelated diversification as dependent variable, *journal impact factor* had a negative and significant effect. The performance effects reported in studies using capital market

Table II. Results of meta-analytic regression analysis (MARA)

Dependent variable: Diversification-performance correlations			
Models	1	2	3
Variables	*Overall, related and unrelated div.*	*Related diversification*	*Unrelated diversification*
Constant	0.013 (0.054)	0.299** (0.091)	−0.313** (0.103)
Methodological controls			
Journal impact factor[a]	−0.043 (0.389)	−1.610* (0.729)	1.551* (0.768)
Fortune 500 sample	−0.031 (0.021)	−0.044 (0.030)	−0.057 (0.040)
Longitudinal design	0.002 (0.018)	−0.001 (0.030)	−0.028 (0.034)
Partial correlation[b]	0.049* (0.019)	0.027 (0.032)	0.002 (0.038)
SIC-based diversification measure	−0.004 (0.017)	0.050† (0.029)	−0.032 (0.036)
Capital market performance measure[c]	−0.029† (0.015)	−0.037 (0.023)	−0.055† (0.034)
Lack of independence in effect sizes[d]	0.008 (0.016)	−0.004 (0.050)	0.065† (0.038)
Country-level controls			
Country size[e]	−0.085* (0.036)	−0.223* (0.090)	−0.100 (0.081)
GDP per capita[e]	−0.001 (0.003)	−0.008 (0.005)	−0.010† (0.005)
Physical infrastructure	−0.001 (0.001)	−0.001 (0.002)	0.001 (0.003)
Country group 1[f]	−0.027 (0.027)	0.028 (0.118)	0.041 (0.053)
Country group 2[g]	−0.077 (0.052)	−0.209† (0.126)	−0.298** (0.108)
Shape of the relationship			
Related diversification[h]	0.060** (0.020)		
Unrelated diversification[h]	−0.050** (0.018)		
Time effect			
Median year of data collection[i]	0.021 (0.015)	0.033 (0.038)	0.112** (0.038)
R^2	0.11	0.30	0.32
K	314	68	79
Q_{Model}	48.20 (0.000)	27.55 (0.01)	36.02 (0.00)
$Q_{Residual}$	401.32 (0.00)	65.12 (0.14)	75.65 (0.17)

K = number of effect sizes; Q = Cochran's homogeneity test statistic (with its probability in parentheses below)
[a]Deflated by a factor of 100
[b]Dummy variable (1 = sample with partial correlation, 0 = product-moment correlation)
[c]Dummy variable (1 = capital market performance as performance measure, 0 = accounting-based performance)
[d]Dummy variable (1 = sample with multiple effect sizes, 0 = sample with one effect size
[e]Deflated by a factor of 1000
[f]Dummy variable for Europe and Japan; default category: Anglo-American countries (USA, UK, Australia, Canada, New Zealand)
[g]Dummy variable for all other countries; default category: Anglo-American countries (USA, UK, Australia, Canada, New Zealand)
[h]Dummy variable; default category: overall diversification
[i]Deflated by a factor of 10.
$^{**}p < 0.01$; $^{*}p < 0.05$; $^{\dagger}p < 0.10$.
Standard errors of regression coefficients in parentheses.

based measures of performance were lower than when accounting-based performance measures were used in two of the three regression analyses (Models 1 and 2).

Second, we included controls relating to the country in which the primary studies were carried out. We find some evidence that in large countries, the performance effects of diversification were lower than in smaller countries ($\beta = -0.087$; $p < 0.05$ in Model 1; $\beta = -0.223$; $p < 0.05$ in Model 2). Furthermore, the level of economic development appears to be associated with lower effects of (unrelated) diversification on performance, as indicated by the negative coefficients of the *GDP per capita* variable and the *country group 2* dummy (country group 2 includes primarily developing countries) in Model 3 however, these effects were weak ($p < 0.1$).

Model 1, which includes the full set of observations, focuses on the overall performance effects of all types of diversification. In order to ascertain the impact of different types of diversification on the diversification–performance relationship, it includes dummy variables for related and unrelated diversification. The coefficient on related diversification is positive and significant ($\beta = 0.060$; $p < 0.01$), and the coefficient on unrelated diversification is negative and significant ($\beta = -0.050$; $p < 0.01$). These results are consistent with the findings by Palich et al. (2000), who interpreted them as evidence of an inverted U-shaped relationship between diversification and firm performance. The temporal effect (median year of data collection) is positive but not statistically significant ($\beta = 0.021$; $p = 0.167$). Therefore, Hypothesis 2, which predicted that the relationship between diversification and firm performance has become more positive over time, is not supported.

Models 2 and 3 respectively report the performance effects of related and unrelated diversification. Both Models have considerably higher explanatory power ($R^2 = 0.30$ and 0.32 for Models 2 and 3 respectively) than Model 1 ($R^2 = 0.11$). In Model 2, which focuses on related diversification, the time effect is again positive but not statistically significant, in line with the results of the HOMA (see below). Therefore, the performance effects of related diversification appear not to have changed significantly over time. In contrast, the time effect in Model 3, which studies the performance effects of unrelated diversification, is highly significant and carries the expected positive sign ($\beta = 0.112$; $p < 0.01$). We followed Jarrell and Stanley (2004) in implementing a Chow test in order to compare Models 2 and 3, which confirmed that the coefficients are statistically different from each other ($F_{14,121} = 7.040$, $p < 0.01$).

In sum, the results show that although the effects of unrelated diversification on performance are negative overall, they have improved significantly with the passage of time. Given that the aggregate performance effects of related diversification have remained relatively stable, this development thus means that the difference between the performance effects of related and unrelated diversification have declined in magnitude over time. These findings provide support for Hypothesis 3, which predicted that the relationship between unrelated diversification and firm performance has improved more over time than the relationship between related diversification and firm performance.

In order to provide further illustrative evidence on the temporal development of the performance effects of diversification, we also ran a set of HOMA analyses (Table 3).

Table III. Development of the diversification-performance relationship over time (HOMA)

	Hedges and Olkin meta-analysis (HOMA)						
Median Year of Data Collection	*K*	$\bar{r}$	SE_r	*95% CI*		*Q*	p_Q
Overall, related and unrelated diversification							
All time periods	387	−0.03**	0.01	−0.03	−0.04	3044.40	0.00
Before 1970	20	0.01	0.05	−0.10	0.11	120.11	0.00
1970 – 1979	37	−0.08*	0.03	−0.15	−0.01	243.54	0.00
1980 – 1989	104	−0.04**	0.01	−0.07	−0.01	605.02	0.00
1990 – 1999	144	−0.02†	0.01	−0.04	0.00	1381.12	0.00
2000 or later	82	−0.03**	0.01	−0.05	−0.01	641.56	0.00
Related diversification							
All time periods	82	0.02	0.01	−0.01	0.04	319.20	0.00
Before 1970	4	0.09	0.10	−0.11	0.29	15.62	0.00
1970 – 1979	9	−0.02	0.05	−0.12	0.08	33.99	0.00
1980 – 1989	21	0.04†	0.02	−0.00	0.08	35.25	0.02
1990 – 1999	27	0.02	0.01	−0.01	0.05	71.08	0.00
2000 or later	21	−0.01	0.02	−0.06	0.04	94.07	0.00
Unrelated diversification							
All time periods	97	−0.07**	0.01	−0.10	−0.05	532.05	0.00
Before 1970	10	−0.08	0.11	−0.29	0.13	92.01	0.00
1970 – 1979	10	−0.15**	0.05	−0.25	−0.05	36.95	0.00
1980 – 1989	26	−0.10**	0.03	−0.15	−0.05	85.16	0.00
1990 – 1999	38	−0.06**	0.02	−0.10	−0.03	185.02	0.00
2000 or later	13	−0.02	0.03	−0.07	0.03	79.60	0.00

K = number of effect sizes; $\bar{r}$ = mean effect size; SE_r = standard error of mean effect size; *Q* = Cochran's homogeneity test; p_Q = probability of *Q*; Results are inverse Fisher z_r transformed (i.e., results are correlations).
$^{**}p < 0.01$; $^{*}p < 0.05$; $^{\dagger}p < 0.10$

With respect to all models, Cochran's *Q*-values reject the assumption of homogeneity. The mean effect size for the diversification–firm performance relationship across all time periods is $\bar{r} = -0.03$, and it differs from zero at 99.9 per cent significance level. We then ran separate HOMAs for the observations by the decade in which the primary data were collected. During the 1970s, the mean performance effect of diversification was $\bar{r} = -0.08$ ($p < 0.05$). In the decades thereafter, this value then declined to between $\bar{r} = -0.04$ and $\bar{r} = -0.02$, less than half of its earlier value. Since 2000, it appears to have edged up again to $\bar{r} = -0.03$.

The HOMA for the performance effects of related diversification showed no significant mean effect sizes, except for the 1980s where the value is positive ($\bar{r} = 0.04$) and weakly significant ($p < 0.1$). Overall, the effect of related diversification on performance is not significantly different from zero. In contrast, unrelated diversification had a clear, negative performance effect ($\bar{r} = -0.07$; $p < 0.01$). This negative effect was greatest in the 1970s ($\bar{r} = -0.15$; $p < 0.01$); thereafter, its magnitude declined continuously ($\bar{r} = -0.10$ in the 1980s and $\bar{r} = -0.06$ in the 1990s) to become insignificantly different from zero in the years since 2000 ($\bar{r} = -0.02$; n.s.). The analysis thus supports the argument that the difference between the mean performance effects of unrelated and those of related diversification have decreased over time, as proposed in Hypothesis 3.

Robustness Tests

We ran several robustness checks to ensure that our findings hold in spite of some differences in the sample. First, we excluded outliers (samples with extreme effect size values) from our analyses, finding that our regression results did not change materially. Second, with respect to our regression on levels of diversification (Table 1), we used a dummy for emerging market country as a control variable in order to control that diversification decreased not only in developed, but also in emerging countries.[6] Finally, we ran a robustness check by eliminating studies that did not report time. The results were similar to the main regression models, including the direction and significance levels of the time dummy.

DISCUSSION AND CONCLUSION

Summary and Theoretical Implications

The objective of our paper was to analyse changes in both the level of diversification and its relationship with firm performance over time. In our study, we were able to build on the rich literature on diversification and its performance outcomes, including several meta-analyses (Bausch and Pils, 2009; Palich et al., 2000; Schüle, 1992). However, from our perspective, much of this literature has taken too broad a view of diversification. For example, extant research has chronicled the decline in overall levels of diversification, in particular in the 1980s and 1990s (Davis et al., 1994; Fligstein and Markowitz, 1993; Lichtenberg, 1992). At first sight, our meta-analysis, which includes primary studies from 60 years of research, confirms this result: Overall levels of diversification have declined, at least when diversification is measured by the Herfindahl index (Table 1, Model 1). When the Entropy index of diversification is used, this decline is visible, too, although the coefficient on the time variable is not statistically significant (Table 1, Model 2). However, when running the analysis separately for related diversification and for unrelated diversification, we find interesting differences in their development over time. Unrelated diversification seems to have declined in a linear fashion (Table 1, Model 4). In contrast, related diversification appears to have increased again since the mid-1990s, following an initial decrease in the late 1970s and during the 1980s (Table 1, Model 3).

Our analysis with respect to levels of diversification thus suggests that the pressure to de-diversify over time has not been uniform across the samples of firms analysed here. Furthermore, our study suggests that in the context of the long-term decline in overall levels of diversification, the relationship between unrelated diversification and firm performance has changed considerably. At first sight, the diversification–performance relationship appears familiar in that it is consistent with the findings produced in previous studies: Our MARA (Table 2, Model 1) confirms the results by Schüle (1992), Palich et al. (2000) and Bausch and Pils (2009), in that related diversification has a significant positive effect on performance, and unrelated diversification a negative and significant effect on performance. The overall (aggregate) effect size is −0.03 ($p < 0.01$; see Table 3). This finding holds true for both accounting-based performance and for capital market performance measures.

However, this result masks another finding that we believe is indicative of a long-term shift in the inverted U-shaped relationship between diversification and firm performance widely reported in the extant literature (Pierce and Aguinis, 2013; Rumelt, 1974). Namely, we find that the relationship between *unrelated* diversification and firm performance has improved significantly over time (Table 2, Model 3). This change is significantly different from the development of the relationship between related diversification and performance, as the application of the Chow test demonstrates. The HOMA further illustrates the steady improvement in the mean performance effect of unrelated diversification (Table 3). In contrast, the mean performance effect of related diversification remained virtually unchanged.

In sum, our study challenges the conventional wisdom that the shape of the diversification–performance relationship is *inherently* inverted U-shaped. We believe that this particular shape of the relationship may have been historically true due a weak selection environment that allowed more firms to pursue unrelated diversification strategies with detrimental performance outcomes. With the strengthening of the selection environment over time, the number of unrelated diversifiers has decreased. For the lower number of firms pursuing unrelated diversification, the performance implications of this strategy appear to be considerably better than was the case in earlier decades. Thus, the right-hand side of the inverted U-shaped relationship between diversification and performance appears to have become flatter over time.

Overall, the findings are consistent with our theoretical argument that suggests that if the relationship between diversification and firm performance varies across environmental conditions (Lee et al., 2008), it will also do so over time. Underlying this argument is the conviction that firms differ from one another in terms of their resources, capabilities and other firm-specific factors (Adner and Helfat, 2003; Hoopes and Madsen, 2008). Likewise, the capacity to manage diversification is heterogeneously distributed across firms (Mackey et al., 2017). Extant research has already identified firm-specific factors such as organization structure (Klein and Saidenberg, 2009) and ownership structure (George and Kabir, 2012) as factors that materially affect the performance implications of diversification. Furthermore, there is evidence that some firms are better than others at creating synergies from related diversification, or using internal capital markets in the pursuit of unrelated diversification (Stein, 1997). Other firms may also have improved their capacity to manage unrelated diversification, as a result of organizational learning (Pennings et al., 1994). The performance-optimal level of diversification thus differs across firms. Given that diversification in general (and unrelated diversification in particular) may also serve purposes other than value maximization (e.g., Jensen, 1986; Jensen and Murphy, 1990; Shleifer and Vishny, 1991; Stulz, 1990) it will then depend on the strength of environmental factors whether firms are forced to make performance-optimal choices about their diversification strategies.

Managerial Implications

Given the heterogeneity in the performance effects of diversification discussed above, decision-makers should not rely on generic recipes to diversify or refocus. They should define their (diversification) strategies in light of their firm-specific resources and capabilities (Chatterjee and Wernerfelt, 1991), and the external conditions in which their firms operate (Li and Greenwood, 2004). For example, our analysis – specifically the significant coefficient on country size in two of the three regressions reported in Table 2 – provides some indications that diversification may provide market opportunities for firms that are constrained by small domestic markets.

It is important to point out that our findings are not a *carte blanche* for strategies of over-diversification. While the strength of the negative effect of unrelated diversification on performance has declined in magnitude, it has not turned positive either (see the lower panel of Table 3); and the negative performance effect of *overall* levels of diversification has remained negative (see the top panel in Table 3). Managers should thus analyse a decision to enter a new line of business carefully, and decide on the merits of each case.

Limitations and Directions for Future Research

Our study is subject to both theoretical and methodological limitations that should be addressed in future research. First, at the heart of our analysis are changes in diversification and in its performance effects over time, yet we do not study the drivers of these inter-temporal changes in a systematic fashion. Our analysis includes a range of country-level controls relating to the economic environment, specifically country size, GDP per capita, and physical infrastructure. In separate analyses, we included measures of capital market efficiency (World Bank, 2015), and instfitutional factors such as Spamann's (2010) anti-director index and the rule of law indicator (Kaufmann et al., 2003) without finding any significant effects. However, these measures are available only since about the 1990s, approximately a third of the 60-year time window analysed here. Furthermore, such measures tend to be too coarse to allow reliable comparisons of institutional conditions across multiple countries. We believe that an in-depth study of how institutional and other environmental conditions affect the diversification behavior of firms, and the performance implications of diversification, will require a longitudinal analysis within particular countries.

Second, we acknowledge that in our regression analysis, a lot of residual variance remains. The independent variables thus explain only a small proportion of the variance in the dependent variables. Our understanding of the drivers of diversification, and in particular of the diversification–performance relationship, thus remains underdeveloped. For example, as most studies use 'mixed' samples of firms (e.g., in terms of age, organization structures, etc.), potential firm-specific drivers of diversification and of the strength of the diversification-performance relationship remain largely hidden from our analysis. Likewise, apart from our coarse distinction between related and unrelated diversification, we cannot compare (samples of) firms that pursue particular diversification strategies (e.g., those that seek to build vertical relationships among their different businesses as compared to horizontal diversifiers (Ansoff, 1957); those that pursue diversification through cooperative strategies as compared to those that do so on their own (Dyer and Singh, 1998)). Future research should seek to provide a more fully-fledged overview of the drivers of diversification and its performance consequences.

Third, our study follows common practice in that diversification is defined and measured at the firm level. Underlying this focus is the conventional image of the publicly owned corporation. However, the decline in diversification that authors such as Michael C Jensen (1997) foresaw was part of the overall demise ('eclipse') of the public corporation. In this context, it may well be the case that the 'locus' of diversification may have shifted to types of ownership structures whose importance, relative to public ownership by widely dispersed shareholders, has arguably increased (e.g., private equity, new types of family offices, etc.). Our analysis of the decline in diversification at the corporate level may thus tell only half of the story. Future research should investigate changes in firm diversification and in the context of changes in ownership structures.

Finally, we acknowledge that we have been liberal in discussing the performance 'effects' or 'outcomes' of diversification, implying a causal relationship where there may only by a correlation. Many of the empirical studies on the diversification–performance relationship employ instrumental variable designs and other approaches to ascertain the order of causality. We included a dummy variable denoting the use of partial correlation coefficients (i.e., regression coefficients, which should provide somewhat greater confidence in the causal nature of the relationship under investigation than correlation coefficients). This dummy variable proved significant in only one of our three MARA models (Table 2, Model 1). However, attempts to determine the 'right order of causality' are fairly futile in light of the theoretical argument that firms' diversification choices are endogenously determined (He, 2009). In line with this argument, we believe that (expected) performance may "drive" diversification as much as diversification 'drives' performance, and that both of them are driven by underlying resources and capabilities. The analysis of effect sizes measured at the sample-level in meta-analytical research tends to cloud the endogenous nature of the relationships investigated here. To overcome this limitation, the application of Bayesian methods to firm-level data (Mackey et al., 2017) is proving particularly fruitful.

Given our finding that the performance effects of related and unrelated diversification have become more similar over time, we believe that future research should also re-conceptualize the very notion of (un-)relatedness. In recent work, Nocker et al. (2016) argued that supply-side measures of relatedness (based on product categories and industry classifications) should be complemented by demand-side ones (relatedness of customer groups / market segments). In addition, we believe it would be worthwhile to consider relatedness in terms of commonality between business models (Teece, 2010) across different lines business pursued by a firm. When analysed from alternative perspectives, diversification may have different (types of) outcomes. These alternative perspectives would then also have practical implications for 'parenting strategies' (Roghé et al., 2013) employed by firms.

CONCLUSION

Despite the limitations of our analysis, we believe our study provides clear indications that both levels of diversification, and the nature of its relationships with firm performance, have changed over time. As levels of diversification have declined, so has the effect of diversification, and of unrelated diversification in particular, on firm performance. Our study calls for greater emphasis to be put on the temporal nature of the phenomena considered in strategic management research.

NOTES

[1] We will discuss the relationship between related and unrelated *types* (or *forms*) of diversification on the one hand, and *levels* of diversification on the other, below.

[2] Palich, Cardinal and Miller (2000) interpreted the positive effect of related diversification on performance and the negative effect of unrelated diversification on performance as evidence of an inverted U-shaped relationship between diversification and firm performance, assuming that unrelated diversification occurs at higher levels of diversification.

[3] If the sampling distribution of the observed outcomes is approximately normal, Fisher's r-to-z transformation is an effective normalizing transformation with variance-stabilizing properties. When the sampling variances of the observed outcomes are (at least approximately) known, for the raw correlation coefficients, the sampling variance is approximately equal to $Var[r] = (1-\rho^2)^2/(n-1)$. However, the value of ρ in this equation is unknown. Using the observed correlation (i.e., r) will provide an inaccurate estimate of the sampling variation, especially in smaller samples. In contrast, the sampling variance of an r-to-z transformed correlation is approximately equal to $Var[z]=1/(n-3)$ – i.e., it does not depend on any unknown quantities.

[4] The Herfindahl index was not split into its related and unrelated components as the sample size in each of the two subgroups would have been too small for a meaningful regression analysis.

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[5] The Herfindahl and Entropy indices differ in measurement insofar as the Herfindahl index has an upper limit of 1, whereas the Entropy index has no upper limit. Therefore, the Entropy index is better able to discriminate between moderate, high and very high levels of diversification, and we deem it to be the more reliable measurement of unrelated diversification.

[6] We used the International Monetary Fund (2014) definition of emerging market and developing economies.

REFERENCES

Adner, R. and Helfat, C. E. (2003). 'Corporate effects and dynamic managerial capabilities'. *Strategic Management Journal*, **24**, 1011–25.

Aguilera, R. V., Desender, K., Bednar, M. K. and Lee, J. H. (2015). 'Connecting the dots: Bringing external corporate governance into the corporate governance puzzle'. *Academy of Management Annals*, **9**, 483–573.

Aguinis, H., Pierce, C. A., Bosco, F. A., Dalton, D. R. and Dalton, C. M. (2011). 'Debunking myths and urban legends about meta-analysis'. *Organizational Research Methods*, **14**, 306–31.

Amit, R. and Livnat, J. (1988). 'Diversification strategies, business cycles and economic performance'. *Strategic Management Journal*, **9**, 99–110.

Ammann, M., Hoechle, D. and Schmid, M. (2012). 'Is there really no conglomerate discount?'. *Journal of Business Finance & Accounting*, **39**, 264–88.

Ansoff, H. I. (1957). 'Strategies for diversification'. *Harvard Business Review*, **35**, 113–24.

Barney, J. B. (1991). 'Firm resources and sustained competitive advantage'. *Journal of Management*, **17**, 99–120.

Barney, J. B. and Arikan, A. M. (2001). 'The resource-based view: Origins and implications'. In Hitt, M. A., Freeman, R. E. and Harrison, J. S. (Eds), *Handbook of strategic management*. Oxford: Blackwell, 124–88.

Basu, N. (2010). 'Trends in corporate diversification'. *Financial Markets and Portfolio Management*, **24**, 87–102.

Bausch, A. and Pils, F. (2009). 'Product diversification strategy and financial performance: Meta-analytic evidence on causality and construct multidimensionality'. *Review of Managerial Science*, **3**, 157–90.

Becker, B. J. and Wu, M.-J. (2007). 'The synthesis of regression slopes in meta-analysis'. *Statistical Science*, **22**, 414–29.

Benito-Osorio, D., Guerras-Martín, L. Á. and Zuñiga-Vicente, J. Á. (2012). 'Four decades of research on product diversification: A literature review'. *Management Decision*, **50**, 325–44.

Berger, P. G. and Ofek, E. (1995). 'Diversification's effect on firm value'. *Journal of Financial Economics*, **37**, 39–65.

Berger, P. G. and Ofek, E. (1996). 'Bustup takeovers of value-destroying diversified firms'. *The Journal of Finance*, **51**, 1175–200.

Bergh, D. D., Johnson, R. A. and Dewitt, R. L. (2008). 'Restructuring through spin-off or sell-off: Transforming information asymmetries into financial gain'. *Strategic Management Journal*, **29**, 133–48.

Bethel, J. E. and Liebeskind, J. (1993). 'The effects of ownership structure on corporate restructuring'. *Strategic Management Journal*, **14**, 15–31.

Bhagat, S., Shleifer, A. and Vishny, R. W. (1990). *Hostile Takeovers in the 1980s: The Return to Corporate Specialization*. Brookings Papers on Economic Activity.

Bijmolt, T. A. and Pieters, R. M. (2001). 'Meta-analysis in marketing when studies contain multiple measurements'. *Marketing Letters*, **12**, 157–69.

Campa, J. M. and Kedia, S. (2002). 'Explaining the diversification discount'. *Journal of Finance*, **57**, 1731–62.

Carney, M., Gedajlovic, E. R., Heugens, P. P. M. A. R., Van Essen, M. and Van Oosterhout, J. (2011). 'Business group affiliation, performance, context, and strategy: A meta-analysis'. *Academy of Management Journal*, **54**, 437–60.

Chakrabarti, A. (2001). 'The determinants of foreign direct investments: Sensitivity analyses of cross-country regressions'. *Kyklos*, **54**, 89–114.

Chakrabarti, A., Singh, K. and Mahmood, I. (2007). 'Diversification and performance: Evidence from east Asian firms'. *Strategic Management Journal*, **28**, 101–20.

Chandler, A. D. (1990). *Scale and Scope: The Dynamics of Industrial Capitalism*. Cambridge, MA and London: Belknap Press.

Channon, D. F. (1971). *The Strategy and Structure of British Enterprise*. Unpublished doctoral dissertation, Harvard University, Cambridge, MA.

Chatterjee, S. and Wernerfelt, B. (1991). 'The link between resources and type of diversification: Theory and evidence'. *Strategic Management Journal*, **12**, 33–48.

Chevalier, J. (2004). 'What do we know about cross-subsidization? Evidence from merging firms'. *Advances in Economic Analysis & Policy*, **4**, 1218–44.

Christmann, P., Day, D. and Yip, G. S. (1999). 'The relative influence of country conditions, industry structure, and business strategy on multinational corporation subsidiary performance'. *Journal of International Management*, **5**, 241–65.

Comment, R. and Jarrell, G. A. (1995). 'Corporate focus and stock returns'. *Journal of Financial Economics*, **37**, 67–87.

Daley, L., Mehrotra, V. and Sivakumar, R. (1997). 'Corporate focus and value creation evidence from spinoffs'. *Journal of Financial Economics*, **45**, 257–81.

Davies, S. and Petts, D. (1997). 'Refocusing and europeanisation in leading british and german companies: A comparison'. In Richter, A. and Owen, G. (Eds), *Corporate Restructuring in Britain and Germany*. London: Anglo-German Foundation for the Study of Industrial Society, 13–29.

Davis, G. F., Diekmann, K. A. and Tinsley, C. H. (1994). 'The decline and fall of the conglomerate firm in the 1980s: The deinstitutionalization of an organizational form'. *American Sociological Review*, **59**, 547–70.
Denis, D. J., Denis, D. K. and Yost, K. (2002). 'Global diversification, industrial diversification, and firm value'. *The Journal of Finance*, **57**, 1951–79.
Dyas, G. P. and Thanheiser, H. T. (1976). *The Emerging European Enterprise: Strategy and Structure in French and German Industry*. London: Macmillan.
Dyer, J. H. and Singh, H. (1998). 'The relational view: Cooperative strategy and sources of interorganizational competitive advantage'. *Academy of Management Review*, **23**, 660–79.
Ennen, E. and Richter, A. (2010). 'The whole is more than the sum of its parts—or is it? A review of the empirical literature on complementarities in organizations'. *Journal of Management*, **36**, 207–33.
Fauver, L., Houston, J. and Naranjo, A. (2003). 'Capital market development, international integration, legal systems, and the value of corporate diversification: A cross-country analysis'. *Journal of Financial and Quantitative Analysis*, **38**, 135–58.
Fligstein, N. and Markowitz, L. (1993). 'Financial reorganization of american corporations in the 1980s'. In Wilson, W. J. (Ed), *Sociology and the Public Agenda*. Newbury Park, CA: Sage, 185–206.
George, R. and Kabir, R. (2012). 'Heterogeneity in business groups and the corporate diversification–firm performance relationship'. *Journal of Business Research*, **65**, 412–20.
Geroski, P. and Jacquemin, A. (1984). 'Large firm in the European corporate economy and industrial policy in the 1980's'. In Jacquemin, A. (Ed.), *European Industry: Public Policy and Corporate Strategy*. Oxford: Clarendon Press, 343–67.
Geroski, P. A. and Gregg, P. (1997). *Coping with Recession: UK Company Performance in Adversity*. Cambridge: Cambridge University Press.
Geyskens, I., Krishnan, R., Steenkamp, J.-B. E. M. and Cunha, P. V. (2009). 'A review and evaluation of meta-analysis practices in management research'. *Journal of Management*, **35**, 393–419.
Gomes, J. and Livdan, D. (2004). 'Optimal diversification: Reconciling theory and evidence'. *Journal of Finance*, **59**, 507–35.
Gopalan, R. and Xie, K. (2011). 'Conglomerates and industry distress'. *Review of Financial Studies*, **24**, 3642–87.
Gort, M. (1962). *Diversification and Integration in American Industry*. Princeton, NJ: NBER Books.
Graham, J. R., Lemmon, M. L. and Wolf, J. G. (2002). 'Does corporate diversification destroy value?'. *The Journal of Finance*, **57**, 695–720.
Grant, R. M. and Jammine, A. P. (1988). 'Performance differences between the wrigley/rumelt strategic categories'. *Strategic Management Journal*, **9**, 333–46.
Grant, R. M., Jammine, A. P. and Thomas, H. (1988). 'Diversity, diversification, and profitability among british manufacturing companies, 1972–84'. *Academy of Management Journal*, **31**, 771–801.
Greene, W. H. (2008). *Econometric Analysis*. Upper Saddle River, NJ: Prentice Hall.
Guillen, M. F. (2000). 'Business groups in emerging economies: A resource-based view'. *Academy of Management Journal*, **43**, 362–80.
Hamilton, R. T. and Chow, Y. K. (1993). 'Why managers divest—evidence from New Zealand's largest companies'. *Strategic Management Journal*, **14**, 479–84.
Hansen, M. H., Perry, L. T. and Reese, C. S. (2004). 'A bayesian operationalization of the resource-based view'. *Strategic Management Journal*, **25**, 1279–95.
Harford, J. (1999). 'Corporate cash reserves and acquisitions'. *Journal of Finance*, **54**, 1969–97.
Hashai, N. (2015). 'Within-industry diversification and firm performance—An s-shaped hypothesis'. *Strategic Management Journal*, **36**, 1378–400.
Haynes, M., Thompson, S. and Wright, M. (2000). 'The determinants of corporate divestment in the UK'. *International Journal of Industrial Organization*, **18**, 1201–22.
He, X. (2009). 'Corporate diversification and firm value: Evidence from post-1997 data'. *International Review of Finance*, **9**, 359–85.
Hedges, L. V. and Olkin, I. (1985). *Statistical Methods for Meta-Analysis*. Salt Lake City, UT: Academic Press.
Helfat, C. E. and Eisenhardt, K. M. (2004). 'Inter-temporal economies of scope, organizational modularity, and the dynamics of diversification'. *Strategic Management Journal*, **25**, 1217–32.
Heugens, P. M. K. M., Van Essen, M. and Van Oosterhout, J. (2009). 'Meta-analyzing ownership concentration and firm performance in Asia: Towards a more fine-grained understanding'. *Asia Pacific Journal of Management*, **26**, 481–512.
Hirschman, A. O. (1964). 'The paternity of an index'. *American Economic Review*, **54**, 761–62.

Hitt, M., Ireland, R. D. and Hoskisson, R. E. (2017). *Strategic Management: Competitiveness & Globalization: Concepts and Cases*. Stamford, CT: Cengage Learning.
Hitt, M. A., Hoskisson, R. E. and Johnson, R. A. (1996). 'The market for corporate control and firm innovation'. *Academy of Mangement Journal*, **39**, 1084–119.
Hoechle, D., Schmid, M., Walter, I. and Yermack, D. (2012). 'How much of the diversification discount can be explained by poor corporate governance?'. *Journal of Financial Economics*, **103**, 41–60.
Hoopes, D. G. and Madsen, T. L. (2008). 'A capability-based view of competitive heterogeneity'. *Industrial & Corporate Change*, **17**, 393–426.
Hope, O.-K. and Thomas, W. B. (2008). 'Managerial empire building and firm disclosure'. *Journal of Accounting Research*, **46**, 591–626.
Hoskisson, R. E., Cannella, A. A., Tihanyi, L. and Faraci, R. (2004). 'Asset restructuring and business group affiliation in french civil law countries'. *Strategic Management Journal*, **25**, 525–39.
Hoskisson, R. E. and Hitt, M. A. (1994). *Downscoping: How to Tame the Diversified Firm*. New York: Oxford University Press.
Hoskisson, R. E., Johnson, R. A., Tihanyi, L. and White, R. E. (2005). 'Diversified business groups and corporate refocusing in emerging economies'. *Journal of Management*, **31**, 941–65.
Hoskisson, R. E. and Turk, T. A. (1990). 'Corporate restructuring: Governance and control limits of the internal capital market'. *Academy of Management Review*, **15**, 459–77.
Hund, J., Monk, D. and Tice, S. (2012). 'Apples to apples: The economic benefit of corporate diversification'.
Hunter, J. E. and Schmidt, F. L. (1990). 'Dichotomization of continuous variables: The implications for meta-analysis'. *Journal of Applied Psychology*, **75**, 334–49.
Hunter, J. E. and Schmidt, F. L. (1990). *Methods Of Meta-Analysis: Correcting Error And Bias in Research Findings*. Newbury Park, CA: Sage.
International Monetary Fund. (2014). *World Economic Outlook*. Washington, DC: International Monetary Fund.
Jacquemin, A. P. and Berry, C. H. (1979). 'Entropy measure of diversification and corporate growth'. *Journal of Industrial Economics*, **27**, 359–69.
Jarrell, S. B. and Stanley, T. D. (2004). 'Declining bias and gender wage discrimination? A meta-regression analysis'. *Journal of Human Resources*, **39**, 828–38.
Jensen, M. C. (1986). 'Agency costs of free cash flow, corporate finance, and takeovers'. *American Economic Review*, **76**, 323–29.
Jensen, M. C. (1997). 'Eclipse of the public corporation'. *Harvard Business Review* (Sept.-Oct. 1989), unpublished.
Jensen, M. C. and Meckling, W. H. (1976). 'Theory of the firm: Managerial behavior, agency costs and ownership structure'. *Journal of Financial Economics*, **3**, 305–60.
Jensen, M. C. and Murphy, K. J. (1990). 'Performance pay and top-management incentives'. *Journal of Political Economy*, **98**, 225–64.
Johnson, G., Scholes, K. and Whittington, R. (2008). *Exploring Corporate Strategy: Text & Cases*. Harlow, England: Pearson Education.
Karna, A., Richter, A. and Riesenkampff, E. (2016). 'Revisiting the role of the environment in the capabilities–financial performance relationship: A meta-analysis'. *Strategic Management Journal*, **37**, 1154–73.
Kaufmann, D., Kraay, A. and Mastruzzi, M. (2009). *Governance matters viii: Aggregate and individual governance indicators, 1996–2008*. Working Paper 4978, World Bank, Washington, DC.
Kaul, V. K. (2003). 'Product-market diversity, resource deployment, and performance'. *Vikalpa: The Journal for Decision Makers*, **28**, 15–29.
Khanna, T. and Palepu, K. (2000). 'The future of business groups in emerging markets: Long-run evidence from Chile'. *Academy of Management Journal*, **43**, 268–85.
Khanna, T. and Palepu, K. G. (1997). 'Why focused strategies may be wrong for emerging markets'. *Harvard Business Review*, **75**, 41–51.
Khanna, T. and Rivkin, J. W. (2001). 'Estimating the performance effects of business groups in emerging markets'. *Strategic Management Journal*, **22**, 45–74.
Klein, P. G. (2001). 'Were the acquisitive conglomerates inefficient?'. *The RAND Journal of Economics*, **32**, 745–61.
Klein, P. G. and Lien, L. B. (2009). 'Diversification, industry structure, and firm strategy: An organizational economics perspective'. *Advances in Strategic Management*, **26**, 289–312.
Klein, P. G. and Saidenberg, M. R. (2010). 'Organizational structure and the diversification discount: Evidence from commercial banking'. *Journal of Industrial Economics*, **58**, 127–55.

Kochan, T. A. and Useem, M. (1992). *Transforming Organizations*. Oxford: Oxford University Press.
Kogut, B., Walker, G. and Anand, J. (2002). 'Agency and institutions: National divergences in diversification behavior'. *Organization Science*, **13**, 162–78.
Kuppuswamy, V. and Villalonga, B. (2010). *Does diversification create value in the presence of external financing constraints? Evidence from the 2008–2009 financial crises*. Working Paper 1569546, Harvard Business School, Boston, MA.
Lamont, O. (1997). 'Cash flow and investment: Evidence from internal capital markets'. *The Journal of Finance*, **52**, 83–109.
Lang, L. and Stulz, R. M. (1994). 'Tobin's q, corporate diversification and firm performance'. *Journal of Political Economy*, **102**, 1248–80.
Lee, K., Peng, M. W. and Lee, K. (2008). 'From diversification premium to diversification discount during institutional transitions'. *Journal of World Business*, **43**, 47–65.
Li, S. X. and Greenwood, R. (2004). 'The effect of within-industry diversification on firm performance: Synergy creation, multi-market contact and market structuration'. *Strategic Management Journal*, **25**, 1131–53.
Lichtenberg, F. R. (1992). 'Industrial de-diversification and its consequences for productivity'. *Journal of Economic Behavior & Organization*, **18**, 427–38.
Lipsey, M. W. and Wilson, D. B. (2001). *Practical Meta-Analysis*. Thousand Oaks, CA: Sage.
Lubatkin, M. and Rogers, R. C. (1989). 'Diversification, systematic risk, and shareholder return: A capital market extension of Rumelt's 1974 study'. *Academy of Management Journal*, **32**, 454–65.
Mackey, T. B. and Barney, J. B. (2013). 'Incorporating opportunity costs in strategic management research: The value of diversification and payout as opportunities forgone when reinvesting in the firm'. *Strategic Organization*, **11**, 347–63.
Mackey, T. B., Barney, J. B. and Dotson, J. P. (2017). 'Corporate diversification and the value of individual firms: A bayesian approach'. *Strategic Management Journal*, **38**, 322–41.
Maksimovic, V. and Phillips, G. (2002). 'Do conglomerate firms allocate resources inefficiently across industries? Theory and evidence'. *Journal of Finance*, **57**, 721–67.
Markides, C. C. (1992). 'Research notes. Consequences of corporate refocusing: Ex ante evidence'. *Academy of Management Journal*, **35**, 398–412.
Markides, C. C. (1995). *Diversification, Refocusing, and Economic Performance*. Cambridge, MA: MIT Press.
Markides, C. C. (1995). 'Diversification, restructuring and economic performance'. *Strategic Management Journal*, **16**, 101–18.
Markides, C. C. and Williamson, P. J. (1994). 'Related diversification, core competencies and corporate performance'. *Strategic Management Journal*, **15**, 149–65.
Matvos, G. and Seru, A. (2012). *Resource Allocation Within Firms and Financial Market Dislocation: Evidence from Diversified Conglomerates*. NBER Working Paper 17717, National Bureau of Economic Research, Cambridge, MA.
Mayer, M. and Whittington, R. (2003). 'Diversification in context: A cross-national and cross-temporal extension'. *Strategic Management Journal*, **24**, 773–81.
McKelvey, B. and Aldrich, H. (1983). 'Populations, natural selection, and applied organizational science'. *Administrative Science Quarterly*, **28**, 101–28.
Montgomery, C. A. (1982). 'The measurement of firm diversification: Some new empirical evidence'. *Academy of Management Journal*, **25**, 299–307.
Montgomery, C. A. (1994). 'Corporate diversification'. *Journal of Economic Perspectives*, **8**, 163–78.
Mueller, D. C. (1969). 'A theory of conglomerate mergers'. *Quarterly Journal of Economics*, **83**, 643–58.
Narasimhan, R. and Kim, S. W. (2002). 'Effect of supply chain integration on the relationship between diversification and performance: Evidence from Japanese and Korean firms'. *Journal of Operations Management*, **20**, 303–23.
Nocker, E., Bowen, H. P., Stadler, C. and Matzler, K. (2016). 'Capturing relatedness: Comprehensive measures based on secondary data'. *British Journal of Management*, **27**, 197–213.
Opler, T., Pinkowitz, L., Stulz, R. and Williamson, R. (1999). 'The determinants and implications of corporate cash holdings'. *Journal of Financial Economics*, **52**, 3–46.
Oyewobi, L. O., Windapo, A. O. and Cattell, K. (2013). 'Impact of business diversification on south african construction companies' corporate performance'. *Journal of Financial Management of Property and Construction*, **18**, 110–27.
Palich, L. E., Cardinal, L. B. and Miller, C. C. (2000). 'Curvilinearity in the diversification-performance linkage: An examination of over three decades'. *Strategic Management Journal*, **21**, 155–74.

Papageorgiadis, N., Cross, A. R. and Alexiou, C. (2013). 'The impact of the institution of patent protection and enforcement on entry mode strategy: A panel data investigation of U.S. Firms'. *International Business Review*, **22**, 278–92.

Peng, M. W., Seung-Hyun, L. and Wang, D. Y. L. (2005). 'What determines the scope of the firm over time? A focus on institutional relatedness'. *Academy of Management Review*, **30**, 622–33.

Pennings, J. M., Barkema, H. and Douma, S. (1994). 'Organizational learning and diversification'. *Academy of Management Journal*, **37**, 608–40.

Peteraf, M. A. (1993). 'The cornerstones of competitive advantage: A resource-based view'. *Strategic Management Journal*, **14**, 179–91.

Pierce, J. R. and Aguinis, H. (2013). 'The too-much-of-a-good-thing effect in management'. *Journal of Management*, **39**, 313–38.

Pils, F. (2009). *Meta-Analysis on the Relationship Between Diversification and Performance*. Wiesbaden: Gabler.

Prahalad, C. K. and Bettis, R. A. (1986). 'The dominant logic: A new linkage between diversity and performance'. *Strategic Management Journal*, **7**, 485–501.

Prahalad, C. K. and Hamel, G. (1990). 'The core competence of the corporation'. *Harvard Business Review*, **68**, 79–91.

Qian, G., Khoury, T. A., Peng, M. W. and Qian, Z. (2010). 'The performance implications of intra-and inter-regional geographic diversification'. *Strategic Management Journal*, **31**, 1018–30.

Qian, G., Li, L. and Rugman, A. M. (2013). 'Liability of country foreignness and liability of regional foreignness: Their effects on geographic diversification and firm performance'. *Journal of International Business Studies*, **44**, 635–47.

Rajan, R., Servaes, H. and Zingales, L. (2000). 'The cost of diversity: The diversification discount and inefficient investment'. *Journal of Finance*, **55**, 35–80.

Ramachandran, J., Manikandan, K. and Pant, A. (2013). 'Why conglomerates thrive (outside the US)'. *Harvard Business Review*, **91**, 110–19.

Richter, A. and Owen, G. (1997). 'Anglo-german corporate restructuring: Will the two systems converge?'. *CEMS Business Review*, **2**, 1–3.

Roghé, F., Pidun, U., Stange, S. and Krühler, M. (2013). *Designing the corporate center: How to turn strategy into structure*. Boston, MA: Boston Consulting Group.

Rosenthal, R. (1991). *Meta-analytic Procedures for Social Research* (Vol. 6). Thousand Oaks, CA: Sage.

Rudolph, C. and Schwetzler, B. (2014). 'Mountain or molehill? Downward biases in the conglomerate discount measure'. *Journal of Banking & Finance*, **40**, 420–31.

Rumelt, R. (1974). *Strategy, Structure and Economic Performance*. Boston, MA: Division of Research, Harvard Business School.

Rumelt, R. P. (1982). 'Diversification strategy and profitability'. *Strategic Management Journal*, **3**, 359–69.

Rumelt, R. P. (1991). 'How much does industry matter?'. *Strategic Management Journal*, **12**, 167–85.

Santalo, J. and Becerra, M. (2008). 'Competition from specialized firms and the diversification–performance linkage'. *Journal of Finance*, **63**, 851–83.

Schüle, F. M. (1992). *Diversifikation und Unternehmenserfolg: Eine Analyse empirischer Forschungsergebnisse*. Wiesbaden: Gabler.

Servaes, H. (1996). 'The value of diversification during the conglomerate merger wave'. *Journal of Finance*, **51**, 1201–25.

Shin, H.-H. and Stulz, R. M. (1998). 'Are internal capital markets efficient?'. *Quarterly Journal of Economics*, **113**, 531–52.

Shleifer, A. and Vishny, R. W. (1989). 'Management entrenchment: The case of manager-specific investments'. *Journal of Financial Economics*, **25**, 123–39.

Shleifer, A. and Vishny, R. W. (1991). 'Takeovers in the '60s and the 80s: Evidence and implications'. *Strategic Management Journal*, **12** (S2), 51–59.

Spamann, H. (2010). 'The "antidirector rights index" revisited'. *Review of Financial Studies*, **23**, 467–86.

Stein, J. C. (1997). 'Internal capital markets and the competition for corporate resources'. *Journal of Finance*, **52**, 111–33.

Stern, I. and Henderson, A. D. (2004). 'Within-business diversification in technology-intensive industries'. *Strategic Management Journal*, **25**, 487–505.

Stulz, R. (1990). 'Managerial discretion and optimal financing policies'. *Journal of Financial Economics*, **26**, 3–27.

Tanriverdi, H. and Lee, C.-H. (2008). 'Within-industry diversification and firm performance in the presence of network externalities: Evidence from the software industry'. *Academy of Management Journal*, **51**, 381–97.

Tanriverdi, H. and Venkatraman, N. (2005). 'Knowledge relatedness and the performance of multibusiness firms'. *Strategic Management Journal*, **26**, 97–119.

Teece, D. J. (1980). 'Economies of scope and the scope of the enterprise'. *Journal of Economic Behavior & Organization*, **1**, 223–47.

Teece, D. J. (2007). 'Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance'. *Strategic Management Journal*, **28**, 1319–50.

Teece, D. J. (2010). 'Business models, business strategy and innovation'. *Long Range Planning*, **43**, 172–94.

Trautwein, F. (1990). 'Merger motives and merger prescriptions'. *Strategic Management Journal*, **11**, 283–95.

Useem, M. (1993). *Executive Defense: Shareholder Power and Corporate Reorganization*. Cambridge, MA: Harvard University Press.

Van Essen, M., Van Oosterhout, J. and Heugens, P. P. M. A. R. (2013). 'Competition and cooperation in corporate governance: The effects of labor institutions on blockholder effectiveness in 23 European countries'. *Organization Science*, **24**, 530–51.

Villalonga, B. (2001). 'Does diversification cause the 'diversification discount'?'. *Financial Management*, **33**, 5–27.

Volkov, N. I. and Smith, G. C. (2015). 'Corporate diversification and firm value during economic downturns'. *The Quarterly Review of Economics and Finance*, **55**, 160–75.

Wan, W. P. (2005). 'Country resource environments, firm capabilities, and corporate diversification strategies'. *Journal of Management Studies*, **42**, 161–82.

Wan, W. P. and Hoskisson, R. E. (2003). 'Home country environments, corporate diversification strategies, and firm performance'. *Academy of Management Journal*, **46**, 27–45.

Whittington, R. and Mayer, M. (2000). *The European Corporation: Strategy, Structure, and Social Science*. Oxford: Oxford University Press.

Williamson, O. E. (1967). 'Hierarchical control and optimum firm size'. *Journal of Political Economy*, **75**, 123–38.

Wilson, D. B. (1998). *Meta-analysis macros for sas, spss, and stata* (5.0 ed.). Available at: https://mason.gmu.edu/~dwilsonb/ma.html (accessed 20 November 2015).

World Bank. (2015). *World Development Indicators 1960–2015* (24 September 2015 ed.). Washington, DC: World Bank.

Zhou, Y. M. (2011). 'Synergy, coordination costs, and diversification choices'. *Strategic Management Journal*, **32**, 624–39.