

On the Matter of How Much Industry Matters

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Richard Rumelt shook the strategy field with his variance decomposition study by concluding that industry and corporate effects on performance were surprisingly small. At the time, many scholars were focusing much of their effort studying topics like corporate strategy and competitive dynamics. This spurred a flurry of replication studies that sought to tweak the methodological approach in multiple ways – perhaps seeking a markedly different answer to the question. At the same time, it fueled the nascent resource-based view by focusing more attention on business unit resources and capabilities as drivers of performance. This article explores both the theoretical and empirical innovation that resulted from the flood of inquiry. It then identifies subsequent opportunities that remain to be explored.

What is the relative strategic importance of choosing industries to enter vs. assembling and deploying resources in those chosen arenas? At its core, strategic management involves choosing both the firm's arena or playing field and the game plan to be successful in that arena. Essentially, the arena reflects the need to identify attractive industries, markets, or products. Here, strategy formulation requires analyzing the prospects of various arenas to inform entry or exit decisions. In contrast, the game plan involves marshaling resources and capabilities to gain an advantage in the chosen arena. In this case, strategy formulation involves analyzing positioning, resource acquisition, and capability deployment relative to rivals in that arena.

Explaining the determinants of performance has been a central topic in both industrial organization (IO) economics and strategic management. For example, from an economics perspective and using cross-sectional data, it is perhaps not surprising that scholars found strong industry effects on profitability (Schmalensee, 1985; Wernerfelt & Montgomery, 1988). Following this work, Rumelt (1991) delved deeper; offering a more detailed descriptive model and focusing more on business unit performance differences within a given industrial context. He found that variation in business unit performance within industries was much greater than industry effects and there was a “vanishingly small” effect attributable to corporate parents (Rumelt, 1991: 182). With over 4600 cites¹, Rumelt's study (1991) set the stage for a plethora of subsequent exploration into factors at different levels both inside and outside the firm, different methodological issues and improvements, refined definitions of firm and industry, and more nuanced theories to explain firm performance as well as other outcome variables. For example, the very large strategic business unit (SBU) effect underscored the importance of the emerging focus on firm-level resources and capabilities (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984).

¹ As of May 2021, on Google Scholar

We examine how scholars have built upon Rumelt (1991), summarizing it and classifying studies into distinct types of contributions. We explore how subsequent work supports, challenges and extends Rumelt's initial observations. This includes an analysis of methods that have been improved and refined, various creative data sources, construct measures and research contexts. We also examine moderators that reflect boundary conditions. Given the significance of Rumelt's central question, the relative importance of industry, corporate and business unit effects, there remains much to be done. We thus conclude by pointing out opportunities for additional inquiry.

In the next sections, we will first explore the significance of this research topic in both academic research and practical implications. We examine how subsequent work developed and augmented strategic management theories. Second, we explore how later studies diverged from Rumelt's original work in terms of research questions, sample selection and methods. To some extent, much of the variance in conclusions on the relative importance of different drivers of profitability seems to stem from distinct methodological approaches. We conclude by exploring how future research can build on prior contributions to this literature.

Why Explore How Much Industry Matters?

We begin by exploring why this question was so important at the time and has inspired so much subsequent inquiry. Rumelt (1991) examines the relative importance of industry- and business unit- and corporate parent-level effects in driving performance. As we shall see, this question is fundamental both in terms of identifying important research questions and in terms of practical implications for teaching and managerial decision-making.

Advances in Economics and Strategy Prompt Rumelt to Revive a Project

In terms of the publication dates, we might be tempted to think of Rumelt (1991) as a response to Schmalensee (1985). However, Professor Rumelt had been working on the problem for some

time. Knott and Hoopes (2016) report that Rumelt had completed a study in 1975 using Compustat data showing that firm-level variance within industries was greater than variance between industries. When Schmalensee's study was published in the American Economic Review, this prompted his renewed interest in the project and a more careful execution of the study. Also, by that time, this question had taken on much more theoretical importance with the emergence of the resource-based view as a foil to the structure-conduct-performance (S-C-P) model in industrial and organizational economics. As such, Rumelt was motivated to return to the earlier project by the confluence of theoretical interest in Economics and Strategic Management. Ultimately this marked a foundational foray examining what theoretical questions are most important to explore.

What research questions are most important?

This question of the relative importance is critical to addressing several streams that tend to conflict in the literature. As we have discussed, this includes the debate between industrial and organizational economics and the resource-based view. However, it also includes a focus on the nature of rivalry and which firms actively compete against each other, corporate vs. business unit strategy, and the role of managers in creating value.

IO Economics vs. the Resource-based View (RBV). As indicated earlier, this research emerged as the resource-based view was beginning to take hold and there was significant tension between the IO economics and resource-based perspectives. Classical industrial-organizational economics examines firm performance differentials using the structure-conduct-performance model and argues that the exogenous industry structure characteristics such as concentration and entry barriers are the dominant determinants (Mason, 1939). Barney (1991) describes the difference in focus in his seminal article. Previously, most strategy research was heavily focused

on the role of market power and, accordingly, how to identify and enter attractive industries (Harrigan, 1981; Porter, 1979). Barney (1991: 100) noted:

“To help focus the analysis of the impact of a firm's environment on its competitive position, much of this type of strategic research has placed little emphasis on the impact of idiosyncratic firm attributes on a firm's competitive position”

With the emergence of the resource-based view, attention was increasingly drawn to explore how and why firms within an industry exhibit heterogeneous performance. Here, the focus was less on market power and more on ways in which unique resources might allow firms to enjoy cost or differentiation advantages (Mahoney & Pandian, 1992; Peteraf, 1993; Wernerfelt, 1984). In some cases, these advantages can be quite durable particularly when they are hard for rivals to imitate or substitute (Barney, 1991; Lippman & Rumelt, 1982; Reed & DeFillippi, 1990). This brought a substantial emphasis on intangible assets such as human capital and reputation that were thought to be hard to imitate (Coff, 1997; Hall, 1993; Knott, Bryce, & Posen, 2003).

Product vs. Factor Market Rivalry. This focus on heterogeneous firm performance also shifted the focus of competitive rivalry research from product to factor market rivalry. That is, IO Economics tended to focus most heavily on rivalry in product markets (Cool & Dierickx, 1993; Demsetz, 1973; Wernerfelt, 1986). For example, incumbents might use limit pricing to deter potential rivals from entering an industry (Masson & Shaanan, 1982; Peteraf & Reed, 1994).

In contrast, the focus on firm-level heterogeneous resources highlights the need to understand how firms gain access to unique resources. Along these lines, Barney (1986) explored competitive strategic factor markets – those in which firms acquire unique resources – as a mechanism for accessing such resources. He sought to explain how firms might, through superior expectations, acquire resources at a bargain. In this way, rivalry in factor markets might extend beyond product markets to more distal rivals that still draw on similar inputs.

Role of Managers in Creating Value. Some branches of strategy research examine the role of the manager and here as well, the IO Economics and RBV perspectives clash. As indicated, the IO Economics paradigm emphasizes choosing attractive industries. To a significant extent, this reflects an emphasis on corporate or multi-business strategy. Effective firms would be those that select and manage their portfolios most effectively both in terms of choosing strong industries and exploiting economies of scope within the portfolios (Hoskisson, 1987; Rumelt, 1982).

However, if corporate effects are negligible, as implied by Schmalensee (1985), how much emphasis should scholars place on corporate strategy research? For that matter, why would corporate effects be so limited? How can we reconcile this with findings showing a substantial impact of corporate climate (Hansen & Wernerfelt, 1989), organizational structure (Teece, 1981) and other corporate parent-level variables. For example, the difference between CEO's seems to explain between 4.5% to 43.9% of variance in profitability (Bowman & Helfat, 2001).

In contrast, the RBV shifts focus to how firms can gain and leverage unique resources (Hoopes, Madsen, & Walker, 2003; Mahoney *et al.*, 1992). This may create advantages within a given business unit or across business units if resources and capabilities are leveraged more broadly (Kor & Leblebici, 2005; Robins & Wiersema, 1995; Silverman, 1999). There may still be a corporate focus on selecting business units but the basis for selection is more on capabilities than it is on industry structure. Again, the tension between the IO economics and RBV perspectives is palpable.

Practical Relevance: Emphasis on teaching and practice

Of course, this tension also had a great deal of practical significance. Do managerial skills matter in predicting firm performance, compared to other contextual factors? What managerial skills and abilities contribute most to competitive advantage? Should they focus more on effective selection of industries to enter or how to gain advantages within an industry context – even in

industries that may be structurally unattractive? How much time and effort should be devoted to acquiring strategic resources?

Naturally, these opposing viewpoints have implications for teaching strategic management. For example, how much time should be devoted to learning how to analyze industry structure as opposed to internal analysis of resources and capabilities? The relative importance of these factors ultimately should drive instructional content.

Implications of Rumelt's Findings and Conclusion

Rumelt (1991) uses the Federal Trade Commission (FTC) line of business to explore the relative importance of time, industry, corporation, and business units on profitability. He adopted two methods: ANOVA and variance component analysis (VCA) with the latter as the primary method. Thus, his starting point was to draw on similar data and methods as Schmalensee (1985).

However, contrary to Schmalensee, Rumelt concludes that the stable industry effect is as low as 8% while stable business unit effects accounted for about 46% of the variance in performance. This effectively reversed Schmalensee's conclusion about the importance of stable industry effects.

Rumelt (1991: 168) noted:

“Indeed, the stable business-unit effects are six times more important than stable industry effects in explaining the dispersion of returns. Business units differ from one another within industries a great deal more than industries differ from one another.”

Methodological Issues and How they Affect Conclusions

Broadly, the problem at hand is how to partition the variance explained by the critical underlying factors. In this case, how much of the variance in performance is explained by business unit, corporate parent, or industry drivers. Rumelt's (1991) study drew considerable attention to this problem and scholars subsequently enhanced and refined the methods applied to this problem. Below, we initially examine Rumelt's methods and then explore approaches that subsequent

scholars adopted. Table 1 offers an overview of the effect sizes found in Rumelt's study as well as the various empirical studies that followed.

Insert Table 1 about here

Overview of Rumelt's Methodological Approach

Following Schmalensee (1985), Rumelt (1991) used Analysis of Variance (ANOVA) and Variance Component Analysis (VCA) to examine the relative impacts of industry, corporate parent and business units on performance. In its simplest form, ANOVA provides a statistical test of whether two or more population means are equal, and therefore generalizes the t-test beyond two means. This allows the variance to be partitioned by level of analysis.

The VCA method is especially helpful where there are concerns of omitted variables affecting the dependent variable and simply adding dummies for categorical variables may use up degrees of freedom limiting statistical power. VCA assumes that observed firm effects are randomly drawn from an underlying population and estimates the mean and variance of these firm effects instead of their individual values. Since a single sample can be viewed as just one draw of the population, the reliability of VCA is lower compared to regression methods (Brush & Bromiley, 1997). It would not be surprising to see different results from Rumelt (1991) emerge from studies using other statistical approaches such as regressions and simultaneous equation models etc. Another problem of VCA is its context-specific nature (Brush *et al.*, 1997). Genetics researchers often use VCA to get variance component estimates to explore specific contexts. Rumelt (1991) didn't describe the importance of any specific context factor but this suggests that findings are harder to generalize beyond the focal sample. In fact, results of VCA can vary considerably with the dimensions of the sample under examination, such as the industry and year coverage, the number of firms per industry, and the inclusion of small or single-business firms etc. (Bowman *et al.*, 2001;

Chang & Singh, 2000). The context-specific nature of VCA corresponds with various results from later studies using differing samples. In the following section, we will show in detail how variation in statistical methods and sample dimensions from Rumelt's starting point can affect the estimation.

These empirical choices may be linked to important differences in the findings. Table 2, below, summarizes how various empirical choices that have been made seem to be associated with changes in the reported effect sizes.

Insert Table 2 about here

Statistical Approaches

Studies following Rumelt (1991) adopted many other approaches which led to some differing conclusions. Considering the nested and cross-sectional structure of businesses data, several scholars argue for the advantages of a multilevel approach over ANOVA and VCA. The multilevel method allows for a complex error structure, no assumption of independence among levels of factors and greater statistical power since they use fewer degrees of freedom (Chaddad & Mondelli, 2013; Guo, 2017; Hough, 2006; Misangyi, Elms, Greckhamer, & Lepine, 2006; Short, Ketchen, Palmer, & Hult, 2007; Tarzijan & Ramirez, 2010). These methods often provide higher estimates of the corporate effect.

Brush, Bromiley, and Hendrickx (1999) use simultaneous models to control the endogenous relationship between corporation and business units and gets corporate effect larger than industry effect. Brush *et al.* (1997) uses the industry and corporate ROA as continuous variables and in turn, build a regression model to measure industry and corporate effects on business unit performance. Ruefli and Wiggins (2003) challenge the *ceteris paribus* assumption and develop a coarse non-parametric approach based on the *mutatis mutandis* assumption. Using stratifications of independent and dependent variables and a Cox regression model to predict the rate of correct

classification, they find that corporate and business unit are better predictors than industry. However, the advantage of this non-parametric approach over VCA and ANOVA is under debate (McGahan & Porter, 2005; Ruefli & Wiggins, 2005).

Using simulation method, Brush *et al.* (1997) argue for an alternative interpretation of results from variance component methods. Simulation results show that the relative ‘importance’ of intra- and inter-industry factors should not depend on the variance component itself, but on the square root of the variance component. Otherwise, as shown in the previous literature, corporate effects will be underestimated, and this can especially be a factor where corporate effects are uneven across business units. Considering the unequal corporate effects among subsidiaries, Zavosh and Dibiaggio (2015) proposed a new model by introducing the business-variant corporate effect, and showed this business-variant corporate effect really counts. Their model also has significantly greater explanatory power in both absolute and relative sense. Other methods such as QCA (Qualitative Comparative Analysis) (Greckhamer, Misangyi, Elms, & Lacey, 2008; Lacey & Fiss, 2009; Leischnig & Kasper-Brauer, 2016) and meta-analysis (Vanneste, 2017) have also been applied but these do not appear to consistently emphasize any one level of analysis over others.

Sample Dimensions

Studies also vary greatly in the nature of the sample explored in terms of industry coverage, time period, and length of the panel. Starting with the industry coverage, the FTC database used by Rumelt only covered the manufacturing sector while COMPUSTAT (used in many later studies) includes almost all sectors and thus provides a broader perspective on the problem. For example, McGahan and Porter (1997) report that the corporate effects contribute the most to profitability in the wholesale/retail industry due to the potential relatedness across units, while it is the SBU effects in manufacturing due to the possible opportunities for competitive positioning.

Samples also vary greatly in terms of the time period covered. Rumelt's sample covers 1974-1977, which immediately followed the oil shock in 1973 and the Nixon administration's policy change on wage and price controls (McGahan *et al.*, 1997). The unusual macroeconomic conditions appeared to amplify the difference between the SBU and industry effects. In comparison, the COMPUSTAT Business Information Industry Segment Data in Roquebert, Phillips, and Westfall (1996) reflected an era when the climate for diversification became more favorable and strategically important during the 1980s than it was in the 1970s (FTC data).

The length of period in the research sample also varied widely. Schmalensee (1985) used only a single year, which does not allow one to discern either SBU effect or year effect since there is no variation among the individual SBUs in a single year. Rumelt (1991) went one-step further by using four years of panel data to distinguish the stable and transient industry effects. McGahan and Porter (2002) argue that Rumelt's four-year period is not long enough to control for business cycles. Considering the possibility that effects may change over time, a longer period will lead to lower estimates of stable effects (McGahan *et al.*, 1997). This, in turn, will underestimate industry effects which tend to persist longer than corporate and business unit effects.

Finally, samples varied in terms of the inclusion/exclusion of single-business firms. For such firms, it is impossible to differentiate corporate from business unit effects. Some researchers assumed the corporate effects of a single business firm to be zero, as did in McGahan *et al.* (1997). Others only include corporations with more than three or four business units (Brush *et al.*, 1999; Roquebert *et al.*, 1996). Due to the independence assumption of ANOVA and VCA, the exclusion of single-unit observations tends to underestimate corporate effects (Bowman *et al.*, 2001).

Measurement of Variables

Rumelt (1991) uses ROA as SBU profitability indicator. However, the intra- and inter-industry inconsistency of accounting policies make it hard to compare firm performance across industries. For example, inconsistencies arise due to distortions during transfer pricing among SBUs and the arbitrary nature of corporate allocation of assets and overhead (Hines Jr, 1996; Kapler, 2000).

Accordingly, some scholars have turned to alternative measures. Powell (1996) uses interview data asking executives about perceptual measures of performance and industry identification, rather than accounting measures. Perceptual measures are not necessarily better but can still be useful since executives have great influence on firm decisions and higher motivations for accurate measures of industry and firm performance. Powell (1996) also directly measures the importance of factors not by variance components but by the difference between the top-performing and bottom-performing firms. Kapler (2000) explored advantages of using the economic accounting rate of return (EARR), compared to the accounting rate of return (ARR). McGahan (1999) adopts three measures of firm performance: Tobin's q, accounting performance and a hybrid measure.

Replications with an Agenda?

Research is often framed as a noble pursuit to find truth. While truth may eventually emerge from the resulting dialog, we should not lose sight of the fact that scholars do not necessarily approach research problems with a blank slate. Rather, implicit agendas often fuel inquiry. In this case, Rumelt's original study challenged the field by suggesting that research at the corporate and industry levels might be less important. He referred to the corporate effect as "vanishingly small" which even called his own original research stream into question (Rumelt, 1974, 1982).

Some empirical findings are viewed as sufficient or definitive. They answer the underlying question in a way that sufficiently satisfies scholars' curiosity. In the management literature

especially, replications of empirical studies tend to be relatively rare (Hubbard, Vetter, & Little, 1998). Given the norms, it might be surprising to find that Rumelt's paper has attracted an unusual number of replication studies. Indeed, what might have sparked so much interest in reviewing and challenging Rumelt's findings?

As we review studies that sought to replicate Rumelt's research, it would perhaps not be surprising that one motivating factor might be a hope or expectation that further inquiry might generate differing conclusions. That is, some scholars might be seeking evidence that confirms the importance of their research. We find that 37% of the replications include at least one author whose prior work falls in a corporate strategy domain such as diversification, mergers & acquisitions, or divestitures. In addition, 21% of the replications include at least one author whose prior work falls in an industry analysis domain such as competitive dynamics, industry structure, market share, or industry growth. To some extent, we might anticipate that these authors could be responding to Rumelt's study as though it reflects a critique of their prior work. If so, they may have approached the problem with an implicit goal of finding evidence of larger corporate and/or industry effects.

This may suggest that some study design choices were made to support these agendas. As the discerning reader may have noticed, scholars often made many research design and measurement changes concurrently. As such, in some cases, it is hard to tell which changes drive the various distinct findings. Ideally, replications would allow us to unpack the changes to see which are most critical in driving us to different conclusions. We therefore interpret some of the methodological innovations with caution as we cannot separate the independent effects of the various choices.

How Has the Conclusion Changed?

The subsequent empirical examination has led to some additional nuance in the conclusions. However, the broad conclusion remains somewhat similar to what Rumelt observed originally. In

his meta-analysis Vanneste (2017) found the average effect sizes for variance measures are: 8% for industry, 14% for corporate and 36% for business units. That is, the SBU effect is largest by a significant margin. Some studies focused whether and to what extent corporate effects matter. Brush *et al.* (1997) and Zavosh *et al.* (2015) find sizable variance attributable to corporate parents. However, the corporate and industry effects are rarely dismissed as “vanishingly small.” While they may be smaller, subsequent research establishes them as significant and certainly worthy of focus among strategy scholars, teachers, and practitioners.

Theoretical Advancements Stemming from Rumelt’s Study

We have so far explored an array of methodological innovations aimed at more nuanced examination of Rumelt's original question. Here, we identify how subsequent theory has built upon and extended Rumelt’s (1991) observations as well as adjacent and new questions that were stimulated by the study. Despite the earlier published work of Schmalensee in economics, it should not be surprising that the impact was largely in the management domain. In fact, less than 15% of the citations to Rumelt’s paper appeared in Economics journals. The lion’s share of the impact has taken place in management and strategy outlets.

Citation Analysis: Who cited the study and why

Within the management arena, scholars most often cited Rumelt (1991) for the conclusion that performance differentials are most heavily driven by business unit (or firm-level) resources and capabilities. This occurred at a time when the resource-based view was gaining steam and provided a somewhat rare island of empiricism amid a sea of theorizing.

At the same time, like many citations, scholars often offered the reference without reflecting carefully on the study’s empirical methods or nuanced findings. That is, the study is most often used to simply demonstrate the importance of idiosyncratic resources and capabilities in general.

For example, we estimate over 50% of references primarily highlight the importance of resources and capabilities without comparing the relative effect sizes of industry and corporate factors. Often these cites appear in the context of research that examines specific kinds of resources and capabilities (brand, human capital, innovative capacity, etc.). These reflect an increased inquiry into different categories of resources that tend to drive business unit level performance. In this way, much of this theory and empirical work does build on a key observation from Rumelt's study but does not address the other levels of analysis (industry and corporate).

It is much rarer to find theoretical references that delve into the relative importance of business unit resources compared to industry or corporate contexts (See, for example Amit & Schoemaker, 1993; Henderson & Mitchell, 1997). In a special issue of SMJ, Henderson *et al.* (1997) discuss potential theoretical reasons why consensus is hard to reach as to whether firm- or industry-level factors are matter more. They argue that both factors matter for firm strategy and performance, but the relationship among organizational capabilities, market competition, strategy and performance can be endogenous, leading to complex and reciprocal interactions at multiple levels. Therefore, it will be nearly futile to simply compare firm- and industry-level influence on firm performance. However, theoretical forays directly exploring effect sizes are still much rarer than the rigorous methodological endeavors that we explored in the previous section.

How Scholars Expanded the Scope of Inquiry

As discussed, Professor Rumelt began this stream of research in his 1975 and set it aside. However, he did not take the project to fruition until responding to Schmalensee's (1985) foray into the topic. As such, the 1991 paper offered more nuanced and reliable results that countered Schmalensee's most critical assertions. This initiated a variety of fruitful conversations.

As mentioned, over 50% of citations to Rumelt (1991) reflect the broad recognition that business unit resources matter. About 4% of citations offer deeper probes on the topic of relative importance of industry, corporate, and business unit effects. These studies extend the inquiry beyond Rumelt's work and explore more nuanced factors and boundary conditions to Rumelt's initial results. More variables are considered and more detailed factors at different levels are included. Here we examine three specific types of extensions scholars have pursued: 1) exploration of different dependent variables beyond RoA, 2) adding or changing explanatory variables and controls to reflect more contextual nuance, and 3) unbundling industry, corporate and business unit levels to study contributions of elements within these levels. We discuss each of these below.

Exploring additional dependent variables beyond performance. The first stream of research alters the left-hand side of the Rumelt's model – beyond traditional performance measures. These include persistence of performance differences, firm failure, and growth prospects.

Persistent Performance Differentials. Going beyond Rumelt's focus on firm performance (i.e., ROA in his paper), some subsequent studies explored the persistence of firm performance, as an indicator of sustainable comparative advantage. Thus, the question becomes whether the relative importance of industry-, corporate-, and business effects shift when sustainability is the outcome. McGahan and Porter (1999) examined the persistence of incremental effects of these levels. Comparing two contrasting logics of industry and firm-efficiency schools, this study showed that industry effects have higher persistence than corporate-parent and business unit effects. Gschwandtner (2005) analyzed persistence in four detailed sectors of the food industry and produced similar conclusions with respect to industry effects.

However, others found that firm-level variation was more important for predicting persistent performance. Using a sample of large Turkish manufacturers, Yurtoglu (2004) observed persistent

profitability and found that, while industry effects are important, firm effects explain more variance. Using a sample from Taiwan's IT industry, Chen and Lin (2010) also found that firm effects matter more. Using a sample of China's listed machinery manufacturing firms, Guan, Cai, and Cao (2015) found that firm effects on persistent performance were stronger as well. Studying abnormal returns, Bou and Satorra (2007) also found greater persistent returns at firm level.

Some comparative international studies suggest contextual factors may affect the relative importance. Tarzijan, Brahm, and Daiber (2008) studied a group of Chilean companies and compared the results with U.S. firms. Industry effects explained more for firms in Chile, but the persistence of abnormal returns was nearly evenly explained by industry-, corporate- and business-specific effects, which suggests country-level differences for effects at different levels.

While there are varying results on the relative importance of industry, corporate, and business unit effects on persistence, most studies seem to show a comparatively larger firm effect.

Other Outcome Variables. Scholars have also examined a variety of other outcomes. Moulton, Thomas, and Pruett (1996) explored firm failures and showed the dominant effects of industry over firm effects. Erkan, Fainshmidt, and Judge (2016) decomposed the variance of firm dividend policies and found that most variance can be attributed to firm and firm-year effects. Chang *et al.* (2000) used the market share as indicator of competitive position and found that corporate effects were sizable for small or medium-sized firms and if firms are narrowly defined. Sample dimensions such as the inclusion of small business, definition of business units and industry aggregation also alter the relative effect sizes on market positions. Magliolo, Madsen, and Walker (2019) use growth option value as the outcome variable and show that firm effects are smaller when industry revenues are growing rather than shrinking. They argue that specific organizational factors matter more in decision-making when firms encounter more conflicts during hard times.

Exploring additional explanatory variables. The second stream of research alters the right-hand side of Rumelt's model by adding variables that are either not considered or not fully examined by Rumelt, such as time factors, exogenous shocks, and environmental changes. These scholars drew attention to internal and external contextual factors that affect variance decomposition. As Brush *et al.* (1997) points out, scholars need to account for context as much as geneticists do in their controlled experiment settings when using variance component analysis.

One line of research focuses on the temporal influences. Compared to Schmalensee (1985), Rumelt considers the industry-specific fluctuations and differentiates the stable and transitory industry effects by adding industry-year interaction term. However, he did not fully examine the nuance in how temporal effects might alter conclusions. Many subsequent studies fill this gap.

Different time periods can matter for the analysis since they offer distinct contexts. For example, McGahan *et al.* (1997) considered that transient effects may emerge at any level. Allowing for serial correlation, they estimated the intertemporal rate of persistence from several sources: macroeconomic shocks, industry, corporate and business units. Guo (2017) partitioned variance into stable and dynamic parts, and found that sum of stable effect of corporate, industry and corporate-industry interaction shows similar importance with that of business unit, and random and nonlinear parts of year effects are of significance in explaining dynamic variance.

Varying industry and economic contexts also affect conclusions. Karniouchina, Carson, Short, and Ketchen (2013) analyzed firm performance under different stages of industry life cycle: growth, maturity, and decline. They found that the relative importance changes across industry stages: the industry and corporate-parent influences get larger through industry stages while the business unit influence decreases when firms go from maturity to the decline stage. Bamiatzi, Bozos, Cavusgil, and Hult (2016) analyzed the context of economic adversity and showed that

firm effect increases during the times of economic hardship while the effects of industry, country, and their interaction decrease, implying the pronounced significance of firm effects in extreme downturns. Also, Wang (2020) replicates Rumelt's analysis using the same statistical method², but with a dataset covering over 40 years and found that the corporate-parent effect is increasing over the years since 1980s, and is now greater than the industry effect.

Beyond temporal effects, a series of studies examine a variety of environmental factors, such as country effects or institutional changes, that reflect distinct macro environmental factors. For example, Hawawini, Subramanian, and Verdin (2004) illustrate the dominance of firm-specific effects over home country effects using a sample of firms across 6 countries. McGahan and Victor (2010) analyzed multinational corporations (MNCs) with various degrees of multinationality and found the effects of industry and home-country matter more to domestic firms than MNCs, and this difference increases with the degree of multinationality. Analyzing MNCs, Makino, Isobe, and Chan (2004) also found that country effects matter as much as industry effects. They also found that industry effects matter more in developing countries while corporate and affiliate effects explain more performance variance in developed countries.

Other macro contextual factors explored include institutional shocks and shifts of industry conditions. Thus, Walker, Madsen, and Carini (2002) explore a unique context when the airline industry undergoes institutional shocks, deregulation of price and entry, and find that part of firm performance heterogeneity comes from the distinction between new entrants and incumbent firms. In many cases adding interaction terms helps to unpack contextual factors.

² Rumelt used the Henderson's Method 1 (HM1) to calculate variance components, a method that can only estimate random-effects and is no longer available in popular statistical packages. The alternative variance component analysis (VCA) method widely used now is the iterative maximum likelihood approach developed by Hartley and Rao (1967). In Wang (2020), the author produced the HM1 by manually translating the method into a MATLAB program.

Many of these contextual factors are reflected as interactions among the factors. Rumelt found significant effect from the corporate-industry covariance term in his model, and this result is refined in subsequent studies (Chang *et al.*, 2000; Guo, 2017; McGahan *et al.*, 1997). For example, Chang *et al.* (2000) include the interaction between corporation and industry since much of corporate effect reflects the choice of industries and corporations actively engage in portfolio management. It is likely that some corporations prefer certain industries, try to leverage their capabilities in a given industry to other related contexts. Therefore, the interaction between corporation and industry can capture an important element of corporate strategy that is missed in the corporate effect alone (Eriksen & Knudsen, 2003). McGahan *et al.* (1997) found a significant negative covariance between corporate parents and industries, implying that corporate parents may be good at improving businesses operating in less attractive industries but less effective at helping business units in more profitable sectors. The significant interaction between corporate parents and industries may also represent the co-evolution of entry decisions with target industry performance (McGahan *et al.*, 2002). The interaction may also capture management's abilities to match the firm's internal strength and weakness to the external opportunities and threats (Eriksen *et al.*, 2003). A variety of other factors have been explored in this way, such as country-industry interaction (Bamiatzi *et al.*, 2016; Goldszmidt, Brito, & de Vasconcelos, 2011; Hawawini *et al.*, 2004; McGahan *et al.*, 2010), interactions between firm ownership type and region, time as well as firm size (Xia & Walker, 2015), and interactions between subnational regional effect with industry, corporate and home-country effect (Ma, Tong, & Fitza, 2013).

Another strand of follow-on studies add firm-level contextual factors. Hawawini, Subramanian, and Verdin (2003) studied the firms at different positions of performance distribution within an industry and distinguish 'outlier' firms from those 'stuck in the middle.' Their results show that

firm effects matter substantially more than industry effects for outlier firms (i.e., industry leaders and losers), while industry effects outweigh firm effects for average firms. Their results have been further discussed in two following commentary papers (Hawawini, Subramanian, & Verdin, 2005; McNamara, Aime, & Vaaler, 2005). Comparing different firm owner types (state, private and foreign owners), Xia *et al.* (2015) find that owner type explains on average 4% of firm performance variation and there are significant interaction effects between ownership geography, and time.

Unbundling industry, corporate, and business unit effects. The last stream of research, though adding more variables into right-hand side of Rumelt's model, seeks to unbundle the industry, corporate and firm effects into more nuanced factors. Prior to Rumelt (1991), Wernerfelt *et al.* (1988) decompose firm performance variance into economic and organizational factors. Their results show that organizational factors (*human resources* and *goal accomplishment*) explain twice the performance variance as economic factors (*firm size, industry, and relative market share*).

Following this stream, some scholars try to break out industry, corporate and business-unit effects into sub elements. Powell (1996) parses out industry effects by empirically deriving three industry factors: industry maturity, entry barrier and competitive power, and shows their relative weights. Misangyi *et al.* (2006) study more specific industry factors (*industry capital intensity, industry munificence* and *industry dynamism*) and also corporate factors (*corporate capital intensity* and *corporate resource availability*). Leischnig *et al.* (2016) uses fuzzy set Qualitative Comparative Analysis to show how industry factors (*stability, product homogeneity, price sensitivity* and *switching cost*) contribute to profitability, and how firm-level selling approaches can promote profitability. Industries can also be broken into strategic groups that compete more directly with each other. Short *et al.* (2007) included strategic groups into their model to show comparable or even larger effects in some cases than typical industry effects.

As a key aspect of corporate effect, CEO effects on firm performance have increasingly drawn attention. This stream of literature, using variance components analysis to examine how much of firm performance can be attributed to CEOs, had been established well before Rumelt (1991). Two sociologists, Stanley Lieberman and James O’Conner, published the first influential work of this literature stream in 1972. Their initial study ignited enormous critiques, commentary and expansions, especially more empirical analysis on the size of CEO effect (e.g., Weiner, 1978; Thomas, 1988; Crossland *et al.*, 2007). These studies cover the topic of both the general CEO effect and the specific contingencies where CEOs face various environmental constraints to influence firm performance (Crossland & Hambrick, 2007; Mackey, 2008).

Fitza (2014) challenged the typical method of variance decomposition in CEO effect studies. Past studies would estimate the CEO effect after controlling for the contextual factors (i.e., year-, industry- and firm-effect). Fitza pointed out that these studies ignored the role of randomness/chance when assessing the role of CEO, which led to an inflated CEO effect. Responding to Fitza’s work, Quigley and Graffin (2017) replicated the empirical analysis and pointed out several methodological diagnostics. They found a CEO effect size consistent with prior studies and argued that Fitza misinterpreted the results from ANOVA and in turn overstated the role of chance in CEO effect.

While studies of the CEO effect stem from earlier work, this question has merged to some extent with Rumelt (1991) in that they often compare their results to the effect sizes of other factors which were central to Rumelt’s study (e.g., industry/corporate/business unit). Taken in the context of corporate effects, these studies identify the fact that corporate strategies are developed and implemented by CEOs and their teams. Indeed, some have explored the impact of top managers at the business unit level. For example, Mackey (2008) shows that CEO effect is more significant at

corporate parent level than at business-segment level. CEOs appear to be as important as industry- and firm-level factors in determining performance. Of course, this is quite consistent with work emerging in economics identifying the effect of management practices on performance (Bloom, Genakos, & Van Reenen, 2012). This line of inquiry can also be expanded to explore the impact of other key decisions such as board of directors (Withers & Fitza, 2017), chief financial officers, or perhaps even star scientists.

Conclusion and Discussion: What Matters Going Forward

Following Professor Rumelt's original study, we have explored the relative effect sizes of business units, industry, and corporate parents on performance. This remains a critical question for the strategic management field where research, teaching, and practice, must reflect the strategic importance of problems occurring at each of these levels of analysis.

The question initially arose in the industrial organization (IO) economics literature where the findings supported industry selection as the primary driver for firm performance (Schmalensee, 1985; Wernerfelt *et al.*, 1988). Rumelt (1991) called this conclusion into question by suggesting that variance in performance at the business unit level is substantially greater than industry and corporate level effects. We have examined in some detail how scholars have built upon Rumelt (1991), summarizing it and classifying studies into distinct types of contributions. Indeed, subsequent work both supports and challenges Rumelt's initial observations and conclusions. While this observation has mostly been used to support and drive further inquiry into the resource-based view (focusing on business unit resources and capabilities), scholars have also extended the line of inquiry into novel research questions that were almost certainly not anticipated initially.

One important contribution was an explosion of innovation in empirical methods for parsing out variance that were increasingly applied to strategic management problems. As a result,

subsequent research was able to improve, refine, and correct methodological issues using various creative data sources, construct measures and research contexts. Scholars have introduced moderating and mediating factors to explore boundary conditions and causal mechanisms. These empirical tools have subsequently been applied to expand the scope of inquiry to adjacent questions and problems.

Below, we offer an overview of some of the specific things we can conclude from this stream of research. In addition, we highlight the many questions that call to us for further exploration as a result of scholar's efforts to date.

What Can we Conclude from Extant Studies?

There are a number of critical conclusions one might draw from this stream of research. Of course, there is the core questions – what is the size of industry effects relative to business unit and corporate effects. We also learn a great deal about the impact of empirical choices that scholars make and we are reminded how the sociology of scientific inquiry plays out in the strategic management field.

Size of Effects. Contrary to the implication that some may draw from in Rumelt's title, we must conclude that industry does, indeed, matter quite a bit. A recent meta-analysis of the many studies using variance decomposition results suggests that strategic business units account for about 36% of the variance in performance. In contrast, about 14% is accounted for by corporate-parents while only 8% of the variance reflects industry effects (Vanneste, 2017). In many respects this is astounding in that the conclusion still seems to harken back to Rumelt's original title: "Does Industry Matter?" Nevertheless, one must still acknowledge that unique recourses must be matched to and deployed in industry contexts. This might be thought of as a key function of corporate

parents but that observation may also drive some of the observed business unit effects. In other words, we would be very reluctant to conclude that industry doesn't matter.

How Empirical Choices Affect Conclusions. When later studies examine the relative importance of industry, corporate and SBU effects, their choice of both statistical approach and the sample selection clearly matter and will likely influence the results. For example, research samples covering more years and mature firms leads to higher industry effects while corporate effects tend to greater if we conduct the study using HLM models on a sample including small and single firms and firms are narrowly outlined. Rumelt's initial inquiry sparked a flurry of innovation to explore the many empirical choices that may tend to alter findings in one direction or another. Future work can build on this by making more informed and careful choices with an understanding of how and why they matter.

Sociology of Strategic Management Inquiry. Science is ultimately a human endeavor. Rumelt hit on an issue that challenged widely held views and spurred many scholars to dig deeper to verify and extend the work. As indicated, replication studies are generally unusual in management and strategy. This, in itself, is a notable event. As such, it is important to understand the agendas that scholars may have in revisiting and challenging prior findings. Here, it is valuable to understand how Rumelt's work challenged prior research and drew scholars in question virtually every aspect of his study in a way that may be unparalleled in the field. It begs the question, what will energize scholars next?

Questions that Matter on the Horizon

Given the significance of Rumelt's central question, the relative importance of industry, corporate and business unit effects, there remains much work yet to be done. We therefore

conclude by pointing out opportunities for additional inquiry that follow from the efforts undertaken thus far.

Remaining Empirical Challenges. It seems unlikely that there is a single correct answer to the effect size question. Rather, there are ranges for the effect size that apply to different contexts and when different methods are employed. In this sense, future research may uncover some nuance in effect sizes but, like much management research, the answer will be “it depends” and further inquiry will generate a greater understanding of what key factors lead us to different relevant ranges.

As indicated earlier, many of the empirical changes introduced are bundled so it is hard (or impossible) to assess their impact individually. Future replications (in this stream and/or others) should be careful to break out the effects of different choices so it is clear what is driving changes in the findings.

The question of what these effect sizes depend upon may send scholars in many directions. First, we know that different samples may impact the findings from VCA models. As such, there are many different combinations of samples that may yield distinct results. Future work might explore different combinations to examine effect sizes in distinct contexts.

Second, other than simulations, studies tend to rely on archival data, which means that they are essentially all post-hoc analyses that do not allow for strong causal inferences. As such, there is a lack of experimental or quasi-experimental methods in this area. Firm structures are often relatively stable during the periods studied so effects are even harder to untangle. Given the endogeneity concerns inherent in the question, it seems natural to conduct further exploration to untangle causality.

Third, it is challenging to add feedback and interaction loops using currently available databases. In the future, big data may create opportunities for more nuanced exploration and complex modelling. This could highlight specific conditions under which effects are enhanced or diminished.

Finally, even very basic definitions of constructs may need to be revisited. Scholars have used convenient data with embedded indicators for SBUs, industry and corporate levels but these are often based on SIC codes of other standard indicators that often do not reflect the more nuanced understandings of industries that typically motivate strategic decisions. There is ultimately tremendous heterogeneity in firm and industry composition such that these coarse indicators almost certainly bias the results. New data sources will likely allow for more careful examination of these questions.

New Theoretical Questions. More recent adjacent inquiries have examined distinct questions that go beyond Rumelt's initial inquiry. These have often focused on different dependent variables such as business failure, competitive advantages or persistence of performance differentials. These questions are related in varying degrees and offer suggestions for new directions. For example, one might explore alliance formation at multiple levels. Typically, the alliance literature treats firms as monolithic entities at the corporate level. The extant literature tends to assume that all alliance ties from one business unit are equally available to other business units – they all reflect a single node in an alliance network. However, such networks may be driven by forces at the business unit (since resources and capabilities may be central) or industry levels (where forces may reward or discourage cooperative ventures).

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Table 1. Effect Size Across Replication Studies

Study	Industry%	SBU%	CorpParent%	Notes
Wernerfelt & Montgomery (1988)	12.3–20		2.6 for SBU+parent	Variance in Tobin's Q
Schmalensee (1985)	19.5	0.6	Negligible	
Rumelt (1991) Sample A	8.3	46.3	0.8~2	
Rumelt (1991) Sample B	4.0	44.2	1.6	Corp effect depend on diversification
Roquebert et al. (1996)	10.2	37.1	0–20 (17.9)	
Powell (1996)	17–20			Based on executives' perceptions
McGahan & Porter (1997) COV	18.7	31.5	4.3	All sectors; inter-temporal persistence
McGahan & Porter (1997) Nested ANOVA	9.4	35.1	9.1	
Brush et al. (1999)	7.3–13.5	53.7–66.6	8.9–14.4	Used continuous variable, not categorical.
McGahan (1999)	29.6–41.5	55.2 –65.7		3 measures of firm performance: Tobin's q, ROA, & a hybrid
McGahan & Porter (2002)	8.9	37.4	8.8	
Becerra & Santaló (2003)	17.9	10.0	40.9	MNCs of different internalization
Eriksen & Knudsen (2003)	11		81 for SBU+parent	Firm-industry interaction effect
Hawawini et al. (2003)	12.4–30.2		16.7–17.6 for SBU+parent	Value-based measures; distinguish industry outliers
Hough (2006)	5.3	40.1	20.2	HLM method
Misangyi et al. (2006)	7.6	36.4	7.2	Corporate-industry interaction
Bou & Satorra (2007)	8.15		91.9 for SBU+parent	Structural equation model
Tarzijan & Ramirez (2010)	7.1	38.0	8.3	Mixed multilevel model
Fukui & Ushijima (2011)	3.0-5.2	-0.3-8.8	51.2-60.7	Japanese multi-business firms
Karniouchina et al. (2013)	4.5–11.4	30.0–46.0	3.3–25.4	Effects by industry life cycle stages
Chaddad & Mondelli (2013)	7.0	18.0	36.1	HLM model of food economy firms
Zavosh & Dibiaggio (2015)	3.1	23.1	23.9-42.9	Includes business-variant corp effect
Guo (2017)	5.3–6.4	29.5–42.1	3.8–5.6	HLM with interaction terms
Vanneste (2017)	8	36	14	Simulation and Meta-analysis

Table 2: How Empirical Choices Influence Findings

Method	Business Unit	Industry	Corporate
Industry	•Manufacturing (+) ^a	•Service/Entertainment (+) ^a •Manufacturing (-) ^b	•Wholesale/Retail ^c
Historical Period	•1974-1977 of FTC dataset: after oil shock & price change (+) ^d •Unrelated conglomerates during the 1970s (+) ^e	-	•Climate of diversification during the 1980s and early 1990s (+) ^c
Data/ Sample	Year Coverage •A single year cannot discern the SBU effect ^f	•Length of periods (+) ^{a, g}	-
Other factors	-	-	•Inclusion of small business (+) ^g •Number of segments per corporation (-) ^a •Include single-business firms (+) ^g
Indefinite Effect	•Number of observations; Number of industries; Number of firms per industry; Size of SBU; Size of parent firm •Business units for analysis: SBU in FTC vs business segment in Compustat •Accounting practices reflected in different data sources		
	-	-	•Hierarchical linear model (HLM) (+) ^{h, i, l} •Simultaneous equation model (+) ^j •Nested ANOVA (+/-) ^{g, i} •Non-parametric (+) ^k
Empirical Model	•Industry Maturity (-) ^h	•Industry Maturity (+) ^h	•Industry Maturity (+) ^h
	• High Internat. (+) ^m	• Low Internat (+) ^m	• High Internat. (+) ^m
	•Large firm (+) ^g	•Small firm (+) ^g	•Medium firm (+) ^g
Measures	•Precise SBU definition (+) ^g	-	•Broad industry definition (-) ^g

^a Roquebert, Phillips, and Westfall (1996)

^b Henderson and Mitchell (1997)

^c McGahan and Porter (1997)

^d Rumelt (1991)

^e McGahan and Porter (2002)

^f Schmalensee (1985)

^h Chang and Singh (2000)

ⁱ Karniouchina, Carson, Short, and Ketchen (2013)

^j Hough (2006)

^k Ruefli and Wiggins (2003)

^l Guo (2017)

^m Adjusted from Becerra & Santaló (2003)