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DOES CORPORATE STRATEGY MATTER?

EDWARD H. BOWMAN[1] and CONSTANCE E. HELFAT[2]*
[1]*The Wharton School, University of Pennsylvania, Philadelphia, Pennsylvania, U.S.A.*
[2]*The Amos Tuck School, Dartmouth College, Hanover, New Hampshire, U.S.A.*

A revisionist view that corporate strategy does not matter has gained considerable influence in recent years. This view largely stems from empirical results of early variance decomposition studies that found negligible corporate effects associated with profitability differences between businesses. Our analysis of the variance decomposition literature shows this view to be incorrect. Not only do the studies as a group show that factors at the corporate level of organizations contribute to profitability differences, but also evidence suggests that factors specifically associated with corporate strategy contribute to corporate effects. Corporate strategy in fact does matter.

INTRODUCTION

Literature on strategic management typically distinguishes between business and corporate strategy. Business strategy deals with the ways in which a single-business firm or an individual business unit of a larger firm competes within a particular industry or market. Corporate strategy deals with the ways in which a corporation manages a set of businesses together (Grant, 1995). In the past several years, researchers have sought to assess the relative importance of industry, business, and corporate factors in determining profitability differences between firms. Perhaps the best known of these works in the field of strategy (Rumelt, 1991) finds that effects specific to individual businesses explain the largest portion of the variance of business-level profitability, followed by much smaller industry effects. Rumelt also finds that corporate effects explain almost none of the variance of profitability. Based in part on Rumelt's work, a number of scholars have suggested that industry effects on profitability are small and that corporate effects do not exist (e.g., Carroll, 1993; Ghemawat, 1994; Ghemawat and Ricart i Costa, 1993; Hoskisson, Hill and Kim, 1993). By implication, the large amount of research, teaching, and consulting related to *corporate* strategy may be a waste of time. In this article, we ask: does corporate strategy matter?

To answer this question, we focus on empirical studies that use variance decomposition techniques, because these studies incorporate the role of entire classes of effects in explaining differences in profitability. Although we are particularly interested in corporate effects, many of the variance decomposition studies emphasize the importance of industry effects (e.g., Schmalensee, 1985; McGahan and Porter, 1997), especially relative to business-level effects (Rumelt, 1991). The emphasis on industry reflects a continuing debate in the literature about the relative importance of the market (looking through the window) vs. the company itself (looking in the mirror) (Bowman, 1990). This debate has centered largely on issues of business rather than corporate strat-

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*Correspondence to: Constance E. Helfat, The Amos Tuck School, 100 Tuck Hall, Dartmouth College, Hanover, NH 03755, U.S.A.

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egy. In the economics literature, for example, Demsetz (1973) argued that the efficiency of individual businesses rather than industry structure (Bain, 1956) determined profitability. Discussions of the resource-based view in strategy have made similar arguments that business-level resources are at least as important as industry-level factors in determining competitive advantage within a market (e.g., Barney, 1991). The resource-based view, however, also contains a significant role for corporate strategy based on utilization of common resources by related businesses within a firm (Peteraf, 1993).

Until recently, the variance decomposition studies have placed less emphasis on the issue of corporate effects on profitability (with the notable exception of Wernerfelt and Montgomery, 1988). Some recent studies, however, focus directly on the corporate effect (Bercerra, 1997; Brush and Bromiley, 1997; Chang and Singh, 1997). These and some other newer studies (Roquebert, Phillips, and Westfall, 1996; McGahan, 1997; McGahan and Porter, 1999) contain noticeably larger estimates of corporate effects than do Rumelt (1991) and Schmalensee (1985) (as well as McGahan and Porter, 1997). We provide a comprehensive analysis and critique of what the variance decomposition studies as a group tell us about the importance of corporate strategy.

Our analysis begins with a brief introduction to variance decomposition techniques. Next we examine corporate-level factors that in theory influence profitability, and the extent to which these corporate influences reflect corporate strategy. Then we discuss some conceptual issues regarding the use of variance decomposition to measure corporate influence on profitability, and explain what the findings of these studies potentially can or cannot tell us about the usefulness of corporate strategy. We also provide an integrative summary of the results of the various studies regarding corporate, business, and industry effects, and show that the studies encompass a much larger range of estimated corporate effects than is commonly thought. This summary includes a completely separate literature in management that asks some similar questions, uses some similar techniques, and predates Rumelt (1991) by almost 20 years, but which none of the current authors discuss. Our analysis then turns to a non-technical and intuitive discussion of some of the data and statistical issues that affect interpretation of the findings in the variance decomposition studies regarding the importance of corporate effects.

Based on analysis of the evidence, we then answer our original question. Yes, corporate strategy matters. Contrary to common perception, many of the studies contain sizeable estimates of corporate effects. Moreover, the methodology and sample composition in many of the studies tend to produce estimates of corporate effects that do not fully reflect the influence of corporate strategy on profitability. Some of the sample selection and methodological issues can be easily remedied and some cannot. Despite these issues, a preponderance of the evidence from these studies shows that corporate effects are non-negligible. Additional evidence that we bring to bear suggests that corporate strategy contributes to the estimated corporate effects. We also make suggestions for future research on the question of whether corporate strategy matters.

VARIANCE DECOMPOSITION

The current empirical debate about the importance of industry, business, and corporate effects began with a study by Schmalensee (1985), followed by studies by Kessides (1987), Wernerfelt and Montgomery (1988), Kessides (1990), Rumelt (1991), Roquebert *et al.* (1996), McGahan and Porter (1997, 1998), McGahan (1997), Brush and Bromiley (1997), Bercerra (1997), Chang and Singh (1997), and Fox, Srinivasan, and Vaaler (1997). All of these studies decompose the variance of business or firm returns (or business market share in one study) into components associated with industry, business, and corporate effects, and some studies include year effects and interaction terms as well. Other studies have analyzed the importance of industry effects only (Powell, 1996), of industry and firm effects (Cubbin and Geroski, 1987; Mauri and Michaels, 1998), and of industry and organizational effects (Hansen and Wernerfelt, 1989). Only the variance decomposition studies examined here, however, separate corporate from business and industry effects on profitability (even though the early studies focused more on industry and business than on corporate effects).

The variance decomposition studies use two methods to estimate corporate, business, and

industry effects on the variance of profitability: analysis of variance and variance components. Both techniques utilize the average of returns to individual corporations, industries, and businesses in the estimation procedures for decomposing the variance of returns.[1] Corporate effects, for example, generally derive from differences between multiple-business firms in the average of returns to individual businesses within each corporation. Industry effects derive from differences between industries in the average of returns to individual businesses within each industry. Finally, business effects typically derive from differences between businesses in the average of annual returns to each business.

As noted previously, scholars have made inferences about the importance of corporate strategy based on estimates of corporate effects in the variance decomposition studies. In order to evaluate such inferences, we first ask: what *in theory* are the corporate-level factors that influence firm or business profitability, and to what extent do these factors reflect corporate strategy? The answer to this theoretical question can then help us to understand the extent to which empirical estimates of corporate effects may inform us about corporate strategy.

CORPORATE INFLUENCE AND CORPORATE STRATEGY

Corporate influence on profitability results from factors associated with membership of multiple businesses within individual corporations. Of the many corporate-level factors that theoretically affect profitability, much research has focused on *scope of the firm*, including selection of industries in which to operate. Building on the work of Rumelt (1974), research has analyzed the link between relatedness in diversification and firm performance. A large amount of research also has investigated the consequences of vertical integration for firms, including the seminal work of Williamson (1975, 1985), who pointed to the advantages of vertical integration when transactions costs are high.

As another well-known example of corporate-level factors thought to affect profitability, Prahalad and Hamel (1990) point to the importance for corporate success of *core competencies* that span businesses within a corporation. With regard to corporations, Chandler (1962, 1977) and Williamson (1975) have emphasized the advantage of the multidivisional (M-form) organization over the functional organization of multiple-business firms. In analyzing the advantages of particular *organizational structures* for multiple-business firms, both Chandler and Williamson argue for the importance of the corporation, as distinct from individual lines of business within the company. Additional research related to firm organization has shown that *organizational climate* affects corporate profitability (Hansen and Wernerfelt, 1989). Other research has dealt with systems of *planning and control*, including the use of strategic versus financial control (e.g., Goold and Campbell, 1987). With regard to financial control and financing of investments, Williamson (1975) has argued for the benefits of internal capital markets in corporations, followed by much subsequent research (see Liebeskind, 2000).

Additionally, profitability may be influenced by *corporate management*, which includes managerial ability, and manifests itself concretely in managerial plans, decisions, directives, advice, and goal setting for the company as a whole and for individual businesses within the corporation (e.g., Andrews, 1987; Hambrick and Mason, 1984).

Which, if any, of the foregoing corporate influences on profitability stem from corporate strategy? To answer this question, we first require a working definition of corporate strategy. Grant (1995: 396–397), for example, identifies the five following concerns of corporate-level strategic management (to which we have added items in italics from the aforementioned corporate influences on profitability): composition of businesses (*scope of the firm*); resource allocation between businesses (*planning and control*); formulation of business unit strategies (*planning and control, corporate management*); control of business unit performance (*planning and control*); coordination of business units and creation of company cohesiveness and direction (*core competencies, organizational structure, organizational climate, corporate management*).

As another example, Jack Welch, the highly regarded CEO of General Electric, has described

[1] Schmalensee (1985) and Rumelt (1991) make clear that variance components estimation utilizes average returns. Standard analysis of variance techniques also utilize average returns (see, for example, Bowman and Fetter, 1967).

important corporate goals and activities at GE (to which we again have added items in italics): require each business to be number one or two in its industry (*planning and control*); reduce the number of management levels (*organizational structure*); seek managerial self-confidence, simplicity, and speed (*organizational climate*); utilize free-form 'workout' discussions among managers at many levels and functional responsibilities to resolve business problems (*corporate management*); select managers with attention to style and performance (*planning and control, corporate management*); provide in-house executive education focused on active rather than passive (i.e., book) learning (*corporate management*); share best practices across divisions and also look to other companies and countries (*core competencies and resources*); set stretch goals for margins, inventory turnover (*planning and control, corporate management*); provide stock compensation to 20,000 employees (*planning and control*) (General Electric, 1995).

The Grant and Welch examples touch on many corporate-level factors thought to influence profitability, as indicated by the terms in italics. Additionally, in these examples, corporate management has at least some impact on all other corporate-level factors that influence profitability. Grant's representative typology, for example, describes strategic *management* and covers factors largely under management control (e.g., allocation of resources). Jack Welch's list reflects the goals of GE's top managers and the activities they put in place (e.g., workout sessions). Research in the field of strategic management commonly uses the terms 'strategy' and 'strategic management' interchangeably. Similarly, we use the term *corporate strategy* as synonymous with *corporate strategic management*, to reflect the contribution of corporate management to corporate-level factors that affect profitability.

Given the foregoing working definition of corporate strategy, we suggest that as a *theoretical* matter, corporate management has some impact on, but not complete control of, corporate-level factors that influence profitability. For example, corporate management by itself cannot build core competencies, which generally reside within an organization and consist in part of organizational routines (Nelson and Winter, 1982). Top management, however, may have an important role in targeting and helping to develop and sustain organizational capabilities (Castanias and Helfat, 1991, 1992). Thus, in theory corporate management and corporate strategy have an impact on but do not fully determine corporate influence on profitability.

Implications for variance decomposition

Based on our discussion thus far, we draw some implications for the variance decomposition studies. First, since in theory corporate strategy is a subset of total corporate influence on profitability, in order to draw conclusions from the variance decomposition studies about corporate strategy, it is important to first determine the accuracy with which estimated corporate effects measure corporate influence. In what follows, we show that estimated corporate effects do not fully capture corporate influence on profitability in general, and the impact of corporate strategy in particular. Therefore, even low estimates of corporate effects may be consistent with a positive influence of corporate strategy on the variability of profitability.

Secondly, if estimated corporate effects are significant rather than nil, then we would like to know if corporate strategy contributes to corporate effects. The variance decomposition studies do not provide evidence related to this issue. That is, the studies do not estimate the contribution of corporate strategic *management* to corporate effects. We therefore introduce evidence from a different and earlier set of 'leadership' studies that estimate the effect of top management, in the form of different CEOs, on the variance of profitability.

THE VARIANCE OF PROFITABILITY

As a foundation for our analysis, we next address some fundamental issues regarding the variance decomposition studies, before summarizing the results of the studies and presenting more detailed analysis of the methods and data. To begin, it is useful to note that the variance decomposition studies treat as similar entities both single-business firms and businesses in larger corporations that are wholly contained within individual industries.[2] The studies also use different terms

[2] Two studies (Bercerra, 1997; Roquebert *et al*., 1996) include only multiple-business firms.

to denote these entities. To prevent confusion, we use the term *business* to refer to company operations contained within an industry, whether in a single-business or a multiple-business firm.

Variance of returns

The variance decomposition studies measure the corporate effect as a percent of the total variance of the dependent variable.[3] This use of *variance* as a measure provides information about differences between multiple-business firms. A negligible estimate of the corporate effect suggests that even if corporate influence has an impact on the level of profitability of individual firms, *differences* between firms in corporate influence are zero. Thus, *the finding of a negligible corporate effect combined with a large business effect (e.g., Rumelt, 1991) implies the elimination of differences in profitability at the corporate level but not at the business level.* Consider how this implication affects the resource-based view, for example. Large business effects but zero corporate effects together suggest equalization of returns to corporate-level resources across corporations, but not to business-level resources across businesses. Such a stark difference in the variation of returns to resources at different levels of the organization obviously would require additional explanation.

In addition to using variance to measure effects on profitability, the studies measure the 'importance' of each effect by its magnitude. That is, the larger the percentage of profitability variance associated with an effect, the greater is the presumed importance of the effect.[4] The studies also generally compare the percent of the total variance of profitability associated with the corporate effect to the percentages of the variance associated with business and industry effects. Such a comparison, however, does *not* provide a useful answer to the question of whether corporate strategy matters in explaining profitability differences between firms, for two reasons.

First, just as corporate influence on profitability in theory may reflect factors in addition to corporate strategy, business and industry influences on profitability in theory may reflect factors other than business and industry-level strategy. For example, business effects may include substantial influence of the histories of individual businesses unrelated to strategic management, such as idiosyncratic and difficult-to-change organizational learning paths (Nelson and Winter, 1982). Therefore, even if estimated business effects comprise a larger portion of the total variance of profitability than do corporate effects, it does not necessarily follow that corporate strategy is less important than business strategy. Business as well as industry effects may reflect difficult-to-change and idiosyncratic factors unrelated to strategy. Hence, the relative size of each effect—corporate, business, or industry—does not allow us to make inferences about the importance of any type of strategy, corporate or otherwise. Instead, it is appropriate to ask whether the corporate effect is non-negligible, i.e., differs statistically significantly from zero.[5]

Second, as analyzed in detail later, empirical estimates of corporate effects may not fully and accurately capture the influence of corporate strategy on the variance of profitability. As one example, consider the way in which a company such as Disney uses its cartoon characters in multiple businesses as an important element of corporate strategy. Suppose that use of the Disney characters greatly improves the performance of the theme-park business relative to theme-park businesses in other companies, but only slightly improves the performance of Disney's film business relative to film businesses in other companies. The estimated corporate effect would capture only the average improvement across Disney's two businesses. The analysis further would

[3] In general, the minimum corporate effect is zero in these studies. A small negative value is usually interpreted as zero (Rumelt, 1991).

[4] Brush and Bromiley (1997) argue that the size of an effect is more properly interpreted as the square root of the percent of profitability variance for that effect. Our point here instead has to do with comparisons between the sizes of different effects, and the difficulty of using such comparisons to make inferences about strategy.

[5] Of the statistical techniques used in the variance decomposition studies, analysis of variance and some variance components techniques produce standard errors that can be used to evaluate statistical significance. Rumelt (1991) also shows how approximate standard errors can be estimated for other variance components techniques. Statistical significance of corporate effects in variance decomposition studies, however, is complicated by the fact that variance components techniques in general have low power (Brush and Bromiley, 1997), as does analysis of variance when firms operate in only a few industries (Kessides, 1987).

attribute the additional improvement in the theme-park business to the business effect rather than the corporate effect.[6] Thus, while as a theoretical matter, corporate strategy is a subset of corporate influence on profitability, as an empirical matter, estimated corporate effects may leave out important elements of corporate strategy. As a result, comparison of corporate and other effects may provide incomplete information regarding the importance of corporate strategy.

In sum, contrary to common perception, the sizes of estimated effects other than the corporate effect do not provide a relevant standard for assessing the importance of corporate **strategy**.

Average returns

As noted earlier, in decomposing the variance of returns, the studies use average returns in the estimation procedures. Therefore, only the *average* of the returns to all of the businesses within a corporation has an impact on the estimated corporate effect. *As a result, individual corporations do not have to have an impact on* ***all*** *businesses in which they participate in order to produce a corporate effect.* Corporations must have an impact on only enough of their businesses to produce a statistical effect. Empirical confirmation of this comes from the results of Brush and Bromiley (1997), which show that measurable corporate effects are possible if each corporation has an impact on only half of its businesses.[7] *Furthermore, the use of average returns within each firm implies that individual corporations need not have an identical impact on each of their businesses in order for studies to find a corporate effect.*

Additionally, individual corporate-level factors that contribute to corporate effects do not necessarily have the same impact on all of the businesses in a firm. Some corporate-level factors may increase returns to some businesses but decrease returns to others—the average effect of such factors within each multiple-business firm contributes to the estimated corporate effect. As suggested by our earlier discussion of corporate-level factors that may influence profitability, any number of empirical studies have found that individual sorts of corporate-level factors statistically 'explain' the variability of at least a portion of the profitability of multiple-business firms, e.g., strategic planning (Miller and Cardinal, 1994), diversification (Montgomery, 1994), vertical integration (Rumelt, 1974), organizational climate (Hansen and Wernerfelt, 1989), organizational structure (Teece, 1981), and international activity (Hitt, Hoskisson, and Kim, 1997). These findings do not preclude the possibility that some corporate-level factors may raise firm profitability overall and others may lower it. Again, the net impact of all corporate-level factors on the average return within each multiple-business firm contributes to estimated corporate effects.

EMPIRICAL STUDIES

The foregoing overarching considerations regarding the structure of variance decomposition studies affect interpretation of the results with regard to the importance of corporate strategy, as do a number of more detailed issues related to data selection and statistical methods. To provide a basis for further analysis of these issues, we next present a summary of the results of the various studies. We also summarize the results of the empirical 'leadership' studies that estimate top management effects on the variance of profitability.

Variance decomposition studies

Table 1 provides a comprehensive summary of the data, empirical techniques, and results of the variance decomposition studies that include corporate effects. Of the variance decomposition studies cited in the prior section, the table omits the studies by Brush and Bromiley (1997) and Fox *et al.* (1997), because the results include simulations. The table includes not only well-known studies, but also less well-known yet published studies and research in circulation as working papers.

Table 1 denotes each study by author in the left-hand column of each page of the table, and for each study the table reports: data sources; years included; definition of an industry; types of industries included; definition of a business; sizes of firms; number of firms, businesses, and businesses per firm; dependent variable; statistical

[6] We are grateful to an anonymous reviewer for this example.
[7] Brush and Bromiley (1997), however, used this result to make a different point than we make here.

Table 1. Variance decomposition studies

Study	Data base	Years included	Industry definition	Types of industries	Definition of a business
Schmalensee (1985)	FTC LOB[a]	1975	LOB ≅3 1/2-digit SIC	Manufacturing only	All co. business in each LOB category
Kessides (1987)	FTC LOB	Sample A: 1975 Sample B: 1974–1976	LOB ≅3 1/2-digit SIC	Manufacturing only	All co. business in each LOB category
Wernerfelt and Montgomery (1988)	Trinet/EIS; FTC; other sources	1976	2-digit SIC	Industrial and utility cos.	All co. business in each LOB category
Kessides (1990)	FTC LOB	1975	LOB ≅3 1/2-digit SIC	Manufacturing only	All co. business in each LOB category
Rumelt (1991)	FTC LOB	1974–1977	LOB ≅3 1/2-digit SIC	Manufacturing only	All co. business in each LOB category
Roquebert *et al.* (1996)	Compustat	1985–1991	4-digit SIC (broadly defined)	Manufacturing only	All co. business in each SIC code
McGahan and Porter (1997)	Compustat	1981–1994	4-digit SIC (broadly defined)	Non-financial	All co. business in each SIC code
McGahan and Porter (1998)	Compustat	1981–1994	4-digit SIC (broadly defined)	Non-financial	All co. business in each SIC code
McGahan (1997)	Compustat	1981–1994	4-digit SIC (broadly defined)	Non-financial	All co. business in each SIC code
Chang and Singh (1997)	Trinet/EIS	1981, 1983, 1985, 1987, 1989	i) 4-digit SIC (narrowly defined) ii) 3-digit SIC	Manufacturing only	All co. business in each: i) 4 digit SIC code; ii) 3 digit SIC code
Bercerra (1997)	Compustat	1991–1994	4-digit SIC (broadly defined): study also includes classification by broad world geographic area	None excluded	All co. business in broad world geographic area (multinational cos. only)

[a]LOB is an abbreviation for 'line of business,' which is an industry classification (Rumelt, 1991).

Table 1. Continued

Study	Firm size	Number of firms	Number of industries	Number of businesses	Number of businesses per firm	Dependent variable (annual data)
Schmalensee (1985)	Mkt share ≥ 1%	456	242	1,775	Avg. = 3.89	ROA per business
Kessides (1987)	Mkt share ≥ 1%	456	242	1,775	Avg. = 3.9	ROA per business
Wernerfelt and Montgomery (1988)	Not given	247[c]	Not reported	Not reported	Not reported	Tobin's q per company
Kessides (1990)	Mkt share ≥ 1%	456	242	1,775	Avg. = 3.89	ln(1-ROS) per business
Rumelt (1991)	Sample A: mkt share ≥ 1%	A: 457	A: 242	A: 1,774	Minium = 1 A: Avg. = 3.88	ROA per business
	Sample B: mkt share > 0	B: 463	B: 242	B: 2,810	B: Avg. = 6.07	
Roquebert *et al.* (1996)	Not given	94–114 in each sample (10 samples)	223–266 in each sample (10 samples)	387–451 in each sample (10 samples)	Minimum = 2 Avg. = 4.01	ROA per business
McGahan and Porter (1997)	Assets and sales ≥ $10 million	7,003	628	12,296	Minimum = 1 Avg. = 1.76	ROA per business
McGahan and Porter (1998)	Assets and sales ≥ $10 million	7,793	668	13,660	Minimum = 1 Avg. = 1.75	ROA per business
McGahan (1997)	Assets and sales ≥ $10 million	4,947	648	9,904	Minimum = 1 Avg. = 2.00	a: Tobin's q per co. b: ROA per business (manuf. only) c: ROA per co.
Chang and Singh (1997)[b]	Sample A: mkt share ≥ 1%	A: 466 (3-digit); 475 (4-digit)	A: 137 (3-digit); 374 (4-digit)	A: 1236 (3-digit); 1531 (4-digit)	Minimum = 1 A. Avg. = 2.65 (3-digit); 3.22 (4-digit)	Mkt. share per business
	Sample B: $2 million to $2 billion sales	B: 710 (3-digit); 693 (4-digit)	B: 137 (3-digit); 390 (4-digit)	B: 2663 (3-digit); 3070 (4-digit)	B. Avg. = 3.75 (3-digit); 4.43 (4-digit)	
Bercerra (1997)	Within largest 100 U.S. cos. in 1994	41	11 industries 5 geographic areas	134	Minimum = 3, Max. = 5 Avg. = 3.27	ROA per business

[b]Range of number of firms, industries, businesses, and number of businesses per firm occurs because the analysis of both samples A and B was conducted twice, once based on 3-digit SIC codes and once using 4-digit codes.
[c]Number of firms in overall sample from which the data on Tobin's q were drawn. Actual number of firms in the data set is not reported.

Table 1. Continued

Study	Statistical technique[d]	Corporate effect	Business effect	Industry effect	Year effect	Industry × Year	Other interactions
Schmalensee (1985)	i) OLS hierarchical regression (ANOVA) ii) variance components	i) zero ii) not included	Mkt share effect: i) 0.2 to 0.6% ii) 0.6%	i) 18.8 to 19.3% ii) 19.5%	Not included	Not included	i) negative cov. bus. & ind. suggested ii) cov. bus. & ind: −0.6%
Kessides (1987)	OLS hierarchical regression (ANOVA)	A: 1 to 8%[e] B: 11 to 54%[f]	Mkt share effect: A: not reported B: 5 to 39%[f]	A: not reported B: 9 to 45%[f]	Not included	Not included	Not included
Wernerfelt and Montgomery (1988)	OLS hierarchical regression (ANOVA)	Corp. focus (relatedness): 0.2 to 3.7%	Mkt share effect: 0 to 2.3%	10.9 to 20.1%	Not included	Not included	Not included
Kessides (1990)	Weighted least squares with a mix of fixed and random effects—hierarchical regression[g]	5.1 to 9.8%	Mkt share effect: 6.6 to 27.5%[f]	4.7 to 25.2%	Not included	Not included	Not included
Rumelt (1991)	i) sequential analysis of variance	i) A: 14.8 to 17.6% B: 10.9 to 11.6%	i) A: 33.9 to 34.0% B: 41.3 to 41.4%	i) A: 15.3 to 17.9% B: 9.8 to 10.3%	i) A: 0% B: 0.1%	i) A: 9.6 to 9.8% B: 6.8 to 7.1%	i) Not included ii) cov. ind. & corporation;
	ii) variance components[h]	ii) A: 0% B: 1.6%	ii) A: 47.2% B: 44.2%	ii) A: 7.3% B: 4.0%	ii) A: 0% B: 0%	ii) A: 8.9% B: 5.3%	A: 0.76% B: 0%
Roquebert *et al.* (1996)	Variance components	17.9% (avg. across samples)	37.1% (avg. across samples)	10.1% (avg. across samples)	0.4% (avg. across samples)	2.3% (avg. across samples)	

[d]For analysis of variance, sizes of estimated effects may have a range depending on variable order of entry.
[e]Kessides (1987) progressively eliminated firms with less than 2, 3, or 4 businesses.
[f]Kessides (1987) allowed the coefficient on market share to vary by industry. This affects all the estimated effects.
[g]Kessides (1990) eliminated outliers, so that results reported here are based on 1711 observations. Kessides also allowed the coefficient on market share to vary by industry.
[h]Results are from Table 1 in Rumelt (1991).

Table 1. Continued

Study	Statistical technique	Corporate effect	Business effect	Industry effect	Year effect	Industry × Year	Other interactions
McGahan and Porter (1997)	i) sequential analysis of variance	i) 9.1 to 11.9%	i) 34.9 to 35.1%	i) 6.8 to 9.4%	Not included	Not included	i) Not included
	ii) variance components	ii) 4.3%	ii) 31.7%	ii) 18.7%			ii) cov. ind. and corp.: –5.5%
McGahan and Porter (1998)	OLS hierarchical regression[i] (ANOVA)	8.8 to 23.7%	32.5 to 59.1%	6.9 to 16.3%	0.2 to 1.1%	Not included	Not included
McGahan (1997)	Sequential analysis of variance[i]	a: corp. focus = 0 to 1% b: 8.3% c: corp. focus = 0 to 0.1%	Asset share effect: a: 35.3 to 66.0% b: 28.7% c: 14.8 to 31.2%	a: 21.6 to 29.4% b: 7.6% c: 8.6 to 10.6%	a: 0 to 2.9% b: 1.2% c: 1.7 to 2.1%	Not included	Not included
Chang and Singh (1997)	Variance components	3-digit SIC: A:0% B:1.6% 4-digit SIC: A:4.3% B:8.5%	3-digit SIC: A:15.2% B:13.7% 4-digit SIC: A:52.7% B:46.8%	3-digit SIC: A:1.6% B:3.1% 4-digit SIC: A:19.4% B:25.4%	3-digit SIC: A:2.4% B:1.0% 4-digit SIC: A:0.9% B:0.3%	3-digit SIC: A:6.2% B:11.4% 4-digit SIC: A:0.9% B:1.8%	Not included
		Sample B (4-digit SIC) Firm size large: 10.9% medium: 25.7% small: 6.3%	Sample B (4-digit SIC) Firm size large: 44.4% medium: 15.8% small: 15.6%	Sample B (4-digit SIC) Firm size large: 24.1% medium: 40% small: 59.4%	Sample B (4-digit SIC) Firm size large: 0.7% medium: 0% small: 0%	Sample B (4-digit SIC) Firm size large: 1.3% medium: 6.9% small: 12.5%	Not included
Bercerra (1997)	i) hierarchical regression (ANOVA) ii) variance components iii) repeated measures random factors (ANOVA)	i) 12% ii) 4.71% iii) 3.05 to 10.95%	i) not reported ii) 27.2% iii) not included	i) not given ii) Industry: 30.4% Geogr. area: 6.9% iii) Industry: 41.9% to 46.8% Geogr. area: 0 to 1%	i) not reported ii) not incl iii) not significant	i) not incl ii) not incl iii) significant	i) not included ii) none iii) year × corp. significant

[i]The range of results reported here includes all of the estimates given in the study, including for subsamples of the data.

techniques employed; estimated corporate, business, industry, year, and interaction or covariance effects. Several of the studies use more than one statistical technique. For each study, the table denotes each technique by number, and in the columns that report the various estimated effects, each technique number denotes estimates obtained using that particular technique. For each study that uses analysis of variance, the table also reports a range of estimates, due to different orderings of variable entry. Additionally, some studies contain two main samples, denoted A and B in the columns that describe either the years included in the sample or firm size, and in the columns that report estimated effects. Sample B usually includes all of sample A plus additional firms. One study (McGahan, 1997) also uses three different dependent variables, which are denoted with different lower case letters in the columns that list the different dependent variables and that report estimated effects.

Table 1 shows that the studies as a group include three sorts of dependent variables—individual business profitability using accounting measures, firm-level return measured as Tobin's q (market value of the firm divided by replacement cost of firm assets), and individual business market share. These three measures of firm performance incorporate different information and in general are imperfectly correlated. Accounting profitability reflects historical profits relative to sales or book value of assets; Tobin's q reflects investor expectations about firm value relative to asset replacement cost; market share reflects business revenues relative to revenues of other businesses in the same industry (McGahan, 1997). The studies use two main techniques: variance components and analysis of variance. Some studies include only manufacturing industries, and some studies include other industries as well. The studies also differ in the inclusion or exclusion of single-business firms, the definition of a business and an industry, the number of years included, the sizes of firms in the sample, and the number of businesses per corporation.

Importantly, the studies in Table 1 show a wide range of estimated corporate effects. In many of these studies, corporate effects are far from nil—sometimes on the order of 18 percent or more, for the full sample or subsamples of the data.

Leadership studies

In addition to the variance decomposition studies in Table 1, a separate and earlier set of studies uses similar techniques to estimate top management effects on profitability. The studies decompose the variance of profitability into year, industry, company, and 'leadership' effects, where leadership effects result from differences between individual chief executives in firm performance. (Strictly speaking, a 'leadership' effect can result from any factor at the firm level associated with the terms in office of chief executives.) The dependent variables used in the leadership studies are substantially the same as those in the variance decomposition studies.

Table 2 summarizes the results of the leadership studies.[8] The table lists each study by author, and for each study reports: data sources; years included; types of industries included; number of firms, industries, and CEOs per firm; dependent variable; statistical technique; estimated CEO (i.e., leadership), firm, industry, and year effects. The studies include multiple-business as well as single-business firms (except perhaps the study by Thomas, 1988), and assign each firm to a broadly defined primary industry.[9] Using analysis of variance, the studies first estimate year effects, then primary industry effects, and then firm effects. These firm and industry effects are fixed (or 'stable') effects that reflect differences between firms (or industries) in the average of each firm's (or industry's) annual returns over the time period of a study. The firm effects in particular capture differences in average profitability between firms due to corporate-level factors (for multiple-business firms), business-level factors, and industry-level factors other than those associated with the primary industry. After estimating year, industry, and firm effects, the analyses then estimate the leadership effect.[10] The latter reflects differences between CEOs in the average annual return per CEO during his term in office,

[8] Table 2 omits one empirical study in this literature by Salancik and Pfeffer (1977), which deals with mayors and city budgets rather than with for-profit companies of interest here. In addition, for purposes of comparability with the variance decomposition studies in Table 1, Table 2 omits results for dependent variables such as total sales or profits that do not reflect rates of return.

[9] Even the Thomas (1988) study may include diversified firms whose primary business is retailing.

[10] Weiner (1978) also varies the order of variable entry.

Table 2. Leadership studies

Study	Data base	Years	Types of industries	Number of firms	Number of industries	Number of CEOs per firm
Lieberson and O'Connor (1972)	Moody's Industrial and Transportation Manuals	1946–1965	Selected less diversified industries (manuf., service, transportation)	167	13	Not reported
Weiner (1978)	Compustat and other sources	1956–1974	Manufacturing	193	Not reported	Avg. = 2.8
Weiner and Mahoney (1981)	Compustat and other sources	1956–1974	Manufacturing	193	Not reported	Avg. = 2.8
Thomas (1988)	Not given	1965–1984	U.K. retailing	12 (ranked in top 200 U.K. firms)	1	Not reported

Study	Dependent profitability variable	Statistical technique	CEO effect[a]	Firm effect[a]	Industry effect[a]	Year effect[a]
Lieberson and O'Connor (1972)	Return on sales per company	Sequential analysis of variance	14.5%	22.6%	28.5%	1.8%
Weiner (1978)	Return on sales per company	Sequential analysis of variance	8.7%	45.8%	20.5%	2.4%
Weiner and Mahoney (1981)	Return on assets per company	Regression combined with sequential analysis of variance	43.9%	Explanatory variables: firm size, capital/labor, debt/equity, % of earnings retained	Explanatory variables: industry sales, industry concentration	Explanatory variable: annual GNP
Thomas (1988)	Return on sales per company	Sequential analysis of variance	5.7%	83.2%	Not included	5.6%

[a]CEO effect entered last in all studies. Other than in Weiner and Mahoney (1981), year effect is entered first, followed by industry effect, firm effect, and then CEO effect. Wener and Mahoney (1981) enter all variables other than the CEO effect together in a regression.

once the mean effects of year, industry, and firm have been accounted for.

The leadership effect represents a transient firm-level effect, in that the leadership effect is estimated based on average annual firm returns per CEO. Each of the firms included in these studies has multiple CEOs. Although estimated corporate effects in some of the variance decomposition studies in Table 1 include transient effects (Schmalensee, 1985; Wernerfelt and Montgomery, 1988; Kessides, 1990),[11] many other studies estimate only stable corporate effects (e.g., Rumelt, 1991; Roquebert *et al.*, 1996; McGahan and Porter, 1997, 1998; McGahan, 1997; Chang and Singh, 1997). The latter reflect any effects of top management only on *average* profitability over the time period of a study. Top management effects in the leadership studies capture additional transitory effects, based on variation in average firm profitability per CEO (Lieberson and O'Connor, 1972; Weiner and Mahoney, 1981).[12] The firm effects in the leadership studies are roughly equivalent to the sum of stable business and corporate effects in the variance decomposition studies,[13] whereas the leadership effect captures one type of transient firm effect for both single-business and multiple-business firms.

Table 2 shows a range of leadership effects. The well-known initial study by Lieberson and O'Connor (1972) estimated substantial leadership effects of 14.5 percent of the total variance of profitability.[14] The estimated leadership effects on the variance of profitability in the other studies range from 6 to 44 percent. Since the studies (except perhaps Thomas, 1988) include some multiple-business firms, the leadership effect should include at least a portion of the transient corporate effect. Surprisingly, none of the studies listed in Table 1 refer to this earlier literature.

A simple look at Tables 1 and 2 suggests that the view that corporate effects are nil is not necessarily correct. Instead, if we were to look simply at the large range of estimates in the tables, we might conclude that we don't know what to think. As we explain in the next sections, however, a more detailed look at the data and methods employed in the individual studies suggests that corporate effects are substantial. In what follows, we first discuss the variance decomposition studies shown in Table 1, and then return to the leadership studies in Table 2.

SAMPLE SELECTION AND DATA ISSUES

Table 1 shows that the variance decomposition studies employ different dependent variables, explanatory variables, and data, and cover different time periods. The studies also differ in their definitions of individual variables and utilize different statistical techniques. Given the sensitivity of statistical analysis in general to all of these sorts of factors, they are likely to account for many of the differences in the findings of the studies. In what follows, we discuss some systematic ways in which differences in the studies produce different estimates of corporate effects. We begin with a discussion of issues related to construction of the data samples that apply to both the analysis of variance and variance components techniques used in the studies. Then we turn to issues related to the use of each statistical technique.

Inclusion and exclusion of single-business firms

One of the most important factors that has an impact on the size of the estimated corporate

[11] Bercerra (1997) includes an interaction term between year and corporation in one part of the study, to capture corporate effects that vary through time. The studies that include only one year of data (Schmalensee, 1985; Wernerfelt and Montgomery, 1988; Kessides, 1990) capture both stable effects and transient effects for that year (Rumelt, 1991).

[12] Studies that cover multiple years will have some turnover in top management. Most studies have found that the average tenure for a CEO in a large U.S. company is 8–10 years, which suggests that on average 1/8 to 1/10 of all CEOs leave office each year. Thus, even in a study of short duration (e.g., the 4-year period in Rumelt, 1991), executive turnover can be substantial.

[13] The firm effects in the leadership studies are not identical to the sum of the business and corporate effects in the variance decomposition studies, because the leadership studies assign each *firm* to a single industry, whereas the variance decomposition studies generally assign each *business* to a single industry. The firm effects in the leadership studies may pick up some residual industry-level effects due to individual company participation in more than one industry that business effects in the variance decomposition studies may or may not pick up, depending on the particular study in question.

[14] This study also estimated smaller leadership effects associated with the dollar value of sales and profits (7.5% and 6.5% respectively).

effect has to do with the inclusion or exclusion of single-business firms, which is reflected in Table 1 in the number of businesses per firm. Statistically, corporate effects derive from multiple-business firms. Many of the variance decomposition studies that include single-business firms define corporate effects as zero in those firms (McGahan, 1997), because otherwise corporate effects are difficult to distinguish from business effects. *Thus, inclusion of single-business firms masks the corporate effect: the larger the proportion of single-business firms in a sample, the smaller is the estimated corporate effect. Conversely, when a study excludes single-business firms, the estimated corporate effect rises.*

As empirical confirmation, we point to the larger corporate effect of 18 percent found by Roquebert *et al.* (1996), who excluded single-business firms,[15] as compared with a corporate effect of 4.3 percent estimated by McGahan and Porter (1997). Both of these studies used Compustat data, but McGahan and Porter (1997) included single-business firms, which comprised a majority of the businesses in their sample. Additional evidence comes from a separate and later study by McGahan and Porter (1998) that excluded single-business firms from one of many subsamples of data, for purposes of comparison with the results of Roquebert *et al.* (1996). McGahan and Porter (1998) found that exclusion of single-business firms increased the estimated corporate effect by 10 percentage points, from 13.7 to 23.7 percent (with a drop in the estimated business effect of similar magnitude and little change in the estimated industry effect).[16]

Thus, an estimated corporate effect in a sample that has a large proportion of single-business firms may tell us little about whether corporate influence and corporate strategy matter to firms for which this is relevant, i.e., for multiple-business firms. In studies that include single-business firms, a negligible or small corporate effect may reflect the proportion of single-business firms in the sample.

Definition of industry and business

The inclusion or exclusion of single-business firms has implications for a second issue that affects estimation of the corporate effect: breadth of industry definition. In the variance decomposition studies, the definition of a business depends on the definition of an industry, because the studies identify each business in a firm as belonging to one particular industry.[17] A broad definition of an industry in terms of product scope therefore implies a broad definition of an individual business within a firm. Additionally, many of the studies utilize data that define a business as *all* of the operations of a company in a single industry. As a result, the more broadly a study defines an industry and a business, the fewer the number of businesses per firm, and the larger the number of single-business firms in the sample than would result with a narrower industry definition. *Thus, a broad definition of industry makes it more difficult to discern corporate effects, in part because the sample contains a greater proportion of single-business firms that dampen the estimated corporate effect.*

Most of the variance decomposition studies define an industry based on 4-digit Standard Industrial Classification (SIC) codes in the Compustat business segment or Trinet/EIS data, or based on line of business classifications in the Federal Trade Commission (FTC) data. SIC codes include broad 2-digit classifications of product markets, more narrow 3-digit classifications, and even narrower 4-digit classifications. The Trinet/EIS data contain the most precise information about the industries in which firms operate, since the data include 4-digit SIC codes assigned to individual plants within companies. The Compustat business segment data contain less precise information, since firms often identify

[15] The only other study to include only multiple-business firms also found non-negligible corporate effects of between 5 and 11 percent (Bercerra, 1997). Since the study defined businesses very broadly as large geographic areas of the world, as discussed in the following section, these numbers may understate corporate influence on profitability.

[16] The number of businesses in a firm also may affect the estimated corporate effect in another way: the greater the number of businesses within a single firm, the lower the likely effect of a corporation on any single business (perhaps beyond some small number of businesses). A corporation that has a large number of businesses may delegate more responsibility to individual businesses than does a firm that has fewer businesses. Roquebert *et al.* (1996) and McGahan and Porter (1998) provide evidence that the estimated corporate effect falls as the average number of businesses in a sample increases beyond two or three.

[17] Bercerra (1997) instead defines a business as all of a company's operations in a broadly defined geographic area of the world.

operations in several 4-digit SIC code industries as a single business (McGahan and Porter, 1997). Variance decomposition studies that rely on Compustat data generally use the primary SIC code for each business.

In the FTC data, the individual line of business classifications vary between approximately the 3-digit and the 4-digit SIC code level (Ravenscraft, 1983). Because the FTC data define a single business as all company operations in one line of business, these data combine into one business all business units within a firm that participate in a single industry (e.g., GM's several auto divisions). In contrast, Compustat allows a company to report more than one business in the same SIC code industry (although many companies in Compustat do equate one set of SIC codes with a single company business).

Chang and Singh (1997) point out that when a variance decomposition study defines industries and businesses broadly, some cross-business influences that occur within a broadly defined business will be attributed to business rather than corporate effects. Only two studies have empirically examined the sensitivity of results to precision in industry definition. Chang and Singh (1997) used the Trinet data to show that definition of industry and business at the narrower 4-digit SIC code level yields corporate effects that are 4–7 percentage points greater than corporate effects estimated using broader 3-digit SIC codes. As an alternative approach, using the FTC data, Fox *et al.* (1997) applied simulation techniques to construct industries defined more narrowly than the FTC lines of business. Fox *et al.* (1997) found that incorporating more narrowly defined industries into a variance components analysis caused the corporate effect to increase from 1.5 to 8.2 percent in the final run of the simulation. *By implication, studies that contain broadly defined industries and businesses, for example based on the Compustat and FTC data, underestimate corporate influence on profitability.*

STATISTICAL APPROACHES

The variance decomposition studies in Table 1 use two main statistical techniques to decompose the variance of profitability or market share: sequential analysis of variance (often using regression methods) and variance components analysis. Some studies employ both techniques and others use just one, the choice of which varies. Next we discuss issues specific to each methodology (with supplementary technical footnotes).

Analysis of variance

In analysis of variance, a researcher typically estimates a null regression model of no effects on the dependent variable other than a constant term, and then progressively adds variables that represent each effect in the model. (Some of the studies have large numbers of observations, and therefore use alternate methods to derive least-squares estimates.) After adding each set of variables, the researcher calculates the increment to the adjusted R^2 of the regression, as an unbiased estimate of the fraction of variance 'explained' (Schmalensee, 1985). The models often include dummy variables for each industry, each business, and each corporation. Some of the studies replace the individual business dummy variables with market (or asset) shares for individual businesses (Schmalensee, 1985; Kessides, 1987; Wernerfelt and Montgomery, 1988: Kessides, 1990; McGahan, 1997), or replace the corporate dummy variables with a measure of corporate focus designed to capture the extent of relatedness in diversification (Wernerfelt and Montgomery, 1988; McGahan, 1997).

As in all hierarchical regression, the order of entry of the sets of dummy variables can have a large impact on the results (Kennedy, 1985). Furthermore, the business-level dummy variables are completely collinear with the corporate-level dummy variables, since each corporation has a dummy variable for every business within the firm. As a result, if a regression that includes both sets of dummy variables enters the business-level variables first, these variables will capture all of the corporate effect. In recognition of this fact, analysis of variance models that include both business and corporate-level dummy variables (rather than share or focus variables) enter the corporate dummy variables prior to the business-level dummy variables.

The latter approach creates an opposite problem that the corporate dummy variables may pick up some of the variability associated with the business dummy variables. For example, although Rumelt (1991) finds in his analysis of variance

(estimated using an approach analogous to standard regression techniques) that the incremental contribution to adjusted R^2 for the corporation ranges from about 11 to 17.5 percent (depending on the sample of firms and the order of variable entry), he discounts these estimates because they might arise from business effects not yet entered into the model. This conservative approach to reporting results, however, neglects useful information contained in analysis of variance estimates of corporate effects. *All else equal, a corporate effect which is entered before the business effect and after year, industry, and industry-year interaction effects provides an upper-bound estimate of the corporate effect, in that the estimate does not also reflect year and industry effects.*[18]

Variance components

The alternative methodology of variance components estimation, sometimes termed a 'random model' of analysis of variance (e.g., Bowman and Fetter, 1967), utilizes statistical techniques for estimating random effects rather than fixed (or 'stable') effects estimated in standard analysis of variance. Estimation of random effects incorporates the assumption that each effect represents a random sample of the true population effect, and that each effect (whether a main or an interaction effect) is independent of the other effects in the model. Schmalensee (1985) used this technique to decompose the variance of business profitability into separate classes of effects (i.e., components of variance), followed by Rumelt (1991) and others.

In a comprehensive critique of the approach, Brush and Bromiley (1997) show that different draws from the same underlying distribution of effects produce very different estimates. Brush and Bromiley (1997) further note that accurate estimation of variance components of profitability requires adjustment for the number of industries, number of corporations per industry, and number of businesses per corporation in each sample of data. With regard to the number of businesses per firm, for different reasons we have previously noted the sensitivity of variance decomposition estimates of corporate effects (for both analysis of variance and variance components) to the inclusion or exclusion of single-business firms.

Interaction effects

The final statistical issue that we raise has to do with interaction or covariance effects. Following Rumelt (1991), most of the studies that have multiple years of data include an effect for the interaction between industry and year, to capture transient industry effects that vary from year to year.[19] Of greater importance for our discussion of corporate effects, few studies include interaction or covariance effects between corporations and years or industries.[20] We examine each of these possible interactions in turn.

First, few variance decomposition studies provide estimates of corporate effects that fluctuate through time, for example by using a corporate-year interaction term.[21] Most studies estimate only 'stable' (i.e., fixed) corporate effects, which reflect differences between corporations only in the average of their returns over time. As a result, if corporations differ in the pattern of their returns through time but nevertheless have the same average return over time, a study that estimates only the stable portion of the corporate effect will find no corporate effect.

With regard to corporate–industry interaction effects, only Schmalensee (1985), Rumelt (1991), and McGahan and Porter (1997) include a covariance term in their variance component analyses. (It often is difficult to include a corporate–industry interaction term separate from the business effect in studies that rely on analysis of variance.[22]) Schmalensee (1985) and Rumelt

[18] Note that this upper bound may be affected by factors discussed earlier, such as inclusion or exclusion of single-business firms and broad definition of industries and businesses. Additionally, as noted in a subsequent section on interaction effects, the estimate generally will not reflect corporate choices of industries in which to operate or corporate influence on industry returns.

[19] McGahan and Porter (1997) use a somewhat different approach to remove transient industry effects, as well as transient business and corporate effects, from their estimates.

[20] Brush and Bromiley (1997) also suggest that it is important to account for covariance of corporate and business effects, a complicated issue that is beyond the scope of this analysis.

[21] In Table 1, the exception is Bercerra (1997). Fox *et al.* (1997) and McGahan and Porter (1999) also estimate both stable and transitory corporate effects.

[22] For example, the studies that use analysis of variance, have multiple years of data, and rely on dummy variables (or an equivalent technique) for businesses and corporations, essentially estimate business effects as the corporate–industry interaction (i.e., the intersection of industries within corporations) (see, for example, DeGroot, 1975; Bowman and Fetter, 1967).

(1991) note that corporations that have greater influence on their businesses also may have identified and entered industries that are either more profitable or less profitable than the average; McGahan and Porter (1997) note that some industries may have greater opportunities for corporate influence than others. Thus, the corporate–industry covariance term may reflect important aspects of corporate *strategy*. Although Schmalensee (1985) and Rumelt (1991) found almost no effect of covariance between corporation and industry, McGahan and Porter (1997) found a negative and non-negligible covariance effect of a similar magnitude to their estimated corporate effect. McGahan and Porter (1997) suggest that the negative covariance indicates that corporations have a more positive influence in less profitable industries, and by implication, a less positive (or even negative) influence in more profitable industries.

In sum, many of the analyses in Table 1 cannot or do not separately account for the covariance or interaction effects of corporations with industries or years. The corporate-year interaction captures variation in corporate influence over time, and the covariance effect between industry and corporation may reflect corporate choices of industries. *As a result, omission of covariance or interaction effects leads to an incomplete description of the influence of corporations, and of corporate strategy in particular, on the variance of profitability.*

DISCUSSION

We began this paper with the assertion that the variance decomposition studies as a group suggest that corporate strategy in fact matters. As the next step in our analysis, we draw on the discussion thus far to argue that corporate effects are substantial rather than negligible. Then we examine statistical evidence which suggests that the corporate strategy portion of corporate effects also is non-negligible.

Estimates of corporate effects

Our discussion of data and statistical issues has pointed to several factors that affect the size of estimated corporate effects. First and foremost, inclusion of single-business firms masks corporate effects in multiple-business firms. Secondly, broad definitions of industries and businesses produce lower estimates of corporate effects than do narrower definitions, in part due to a greater proportion of single-business firms in the sample, and in part because some cross-business influences are estimated as business rather than corporate effects. More generally, as noted earlier in the Disney example, variance decomposition may attribute some elements of corporate strategy to business effects rather than to corporate effects. Third, analysis of variance provides useful upper-bound estimates of corporate effects that can be helpful in comparing subsamples of firms with differing characteristics (see, for example, McGahan and Porter, 1998). And fourth, studies that lack interaction or covariance effects between corporations and years or industries do not fully account for the influence of corporate strategy on the variance of profitability.

Non-negligible corporate effects

Despite the shortcomings of these studies, they contain a good deal of information about corporate effects. All of the studies in Table 1 except Schmalensee (1985) estimated non-negligible corporate effects based on analysis of variance.[23] Of the studies that used variance components, only Schmalensee (1985) and Rumelt (1991) estimated negligible corporate effects.[24] In short, despite the many issues we have raised, the variance decomposition studies as a group show non-negligible and often substantial corporate effects.

Two recent variance decomposition studies have suggested that corporate effects are substan-

It therefore is difficult to include a corporate–industry interaction term in the analysis. (Analysis of variance studies that have a single year of data use market share to measure business effects.)

[23] Wernerfelt and Montgomery (1988) report a small but significant corporate effect. This effect includes only that portion of the corporate effect associated with corporate focus. McGahan (1997) reports a negligible corporate effect using a corporate focus variable, but a substantial corporate effect otherwise.

[24] McGahan and Porter (1997) report a small but non-negligible corporate effect of 4.3 percent. Chang and Singh (1997) report negligible corporate effects only when industries and businesses are defined broadly, and in the rest of the study report often substantial corporate effects.

tial primarily for non-manufacturing companies (McGahan and Porter, 1997) or for medium-sized firms (Chang and Singh, 1997), but not for large U.S. manufacturing firms analyzed by Rumelt (1991) and Schmalensee (1985). Further consideration of the results reported in Table 1 and of statistical issues raised previously, however, suggests that corporate effects are substantial even in large manufacturing companies.

First, when the analysis of large manufacturing companies includes only firms in which we would expect to find corporate effects—namely, multiple-business firms—estimated corporate effects are substantial. For large multiple-business manufacturing firms only, Roquebert *et al.* (1996) estimated an average corporate effect of 18 percent, and McGahan and Porter (1998) estimated a corporate effect of 23.7 percent (as compared with an estimated corporate effect of 13.7 percent when the analysis included single-business firms as well). Both of these studies used Compustat data, which define industries and businesses broadly and therefore may reduce the estimated corporate effect even when single-business firms are excluded. As noted earlier, two other studies defined manufacturing industries and businesses more narrowly than in the Compustat and FTC data (although the analyses included single-business firms). Chang and Singh (1997) estimated a corporate effect of 11 percent using variance components analysis for the largest firms in their sample of U.S. manufacturing firms, when industries and businesses were defined at the 4-digit SIC code level. And using the same data source as did Schmalensee (1985) and Rumelt (1991), when Fox *et al.* (1997) defined industries narrowly, a corporate effect of 8.2 percent resulted in the final simulation run.

Given the foregoing evidence that corporate effects are non-negligible even in large manufacturing firms, it makes sense to ask why Rumelt (1991) might have obtained a negligible corporate effect for his sample of U.S. manufacturers. Although Rumelt did find substantial corporate effects on the order of 11–17 percent using analysis of variance, variance components estimation resulted in a negligible corporate effect. The FTC Line of Business data used by Rumelt (1991), however, contain some single-business firms.[25] As Rumelt (1991) himself noted, Kessides (1987) reanalyzed one year of the FTC data for firms with three or more businesses, and found a statistically significant corporate effect—on the order of 4 percent, after accounting for industry and market share effects.[26] The FTC data also may contain too broad a categorization of businesses and industries to accurately measure corporate influence on profitability.

To provide a sense of the importance of corporate effects as measured by variance decomposition, an example may help. Consider a business with 500 million dollars in assets, which is one of several businesses in a corporation. If the corporate effect amounts to even 10 percent of the variance of business profitability, this can translate into substantial profitability differences between businesses in different corporations. For example, based on the distribution of returns in Rumelt's (1991) sample A (mean return on assets of 13.92% and standard deviation of 16.71%), average profits for a 500 million dollar asset business would equal 67.7 million dollars (with a standard deviation of 83.55 dollars). If we assume a normal distribution of returns, a corporate effect of 10 percent in this example translates into a difference of 16.71 million dollars in profits—*1/4 of the value of the mean return*—between a business at the edge of the upper sixth of the distribution of profits and a business at the edge of the lower sixth of the distribution.[27] As this simple example shows, a corporate effect may involve a substantial sum of money, both in absolute value and as a percentage of mean profits.

Implications for the importance of corporate strategy

We noted previously that the influence on profitability of corporate strategy stems from corpo-

[25] Kessides (1987) reports that 25 percent of the firms in Schmalensee's (1985) sample of FTC data operated in only one line of business, comprising 6 percent of the businesses in the sample; 42 percent of the firms operated in at most two lines of business, comprising 15 percent of the businesses in the sample.

[26] Kessides (1987) also found that, using 3 years of FTC data, when the market share effect was allowed to vary by industry, the incremental corporate effect (entered last, after industry and market share effects) was 11 percent.

[27] Approximately 2/3 of a normal distribution lies between the point in the distribution which is one standard deviation above the mean and the point which is one standard deviation below the mean. In this example, the difference between the

rate management. Although the variance decomposition studies do not provide direct evidence about the effects of corporate strategic management, the leadership studies shown in Table 2 estimate top management effects on profitability. As Hambrick and Mason (1984) point out, the discretion of top managers often is limited by factors not under their control. Given this observation, even the lowest estimated leadership effect in Table 2 of 6 percent suggests that individual leaders (or more correctly, factors associated with the terms of individual leaders, such as the entire top management team) matter—and by implication, strategic management at the top of the firm matters as well.

As noted earlier, the estimated top management effects reflect variation through time. Although none of the variance decomposition studies in Table 1 explicitly estimate transitory top management effects, a study by McGahan and Porter (1999) provides evidence regarding the magnitude of transitory versus stable corporate, business, and industry effects. Using sequential weighted least-squares where the corporate effect was entered after year and industry effects but before the business effect, McGahan and Porter (1999) found that the average transitory (i.e., incremental) corporate effect approximately equaled the average stable (i.e., fixed) corporate effect in magnitude. The estimated fraction of the incremental component in one year that arose in the following year was 0.72—a substantial rate of persistence.

Both the incremental corporate effect in McGahan and Porter (1999) and the CEO effects in the leadership studies capture aspects of variation through time in the corporate effect.[28] McGahan and Porter (1999) show that a substantial fraction of corporate effects vary through time; the leadership studies show that transitory CEO effects comprise a non-negligible portion of the total variance of firm profitability. Taken together, this evidence suggests that transitory corporate effects matter, and that top management and thus corporate strategy contribute to these effects. Furthermore, given that the leadership studies provide evidence that CEOs matter, we can infer that stable corporate effects also may reflect effects of CEOs and corporate strategy on average profitability over time.

In sum, the leadership studies suggest that corporate management and corporate strategy contribute to corporate effects. Studies that estimate **only** *stable corporate effects, however, capture only the impact of corporate management on average profitability over the time period of a study—which may exclude many influences of corporate strategy on profitability, including changes in corporate managers.*

CONCLUSION

We have argued that contrary to a revisionist view of strategic management, the variance decomposition studies suggest that corporate strategy matters. To conclude our discussion, we highlight key points of the analysis and evaluate the incremental addition to our knowledge that these studies provide about the importance of corporate strategy. We also make suggestions for future research.

Key issues

First, we have argued that the relevant criterion in the variance decomposition studies for assessing the importance of corporate strategy is whether estimated corporate effects are non-negligible. Comparison with other effects in the model does not provide an appropriate standard. Without knowledge of the strategy portion of each type of estimated effect, we cannot draw definitive conclusions about the importance of corporate strategy relative to business-level or industry-level strategy.

Second, many of the studies produce substantially lower estimates of corporate effects than would occur if the studies did not include single-business firms in the sample, or broadly define industries and businesses, which also increases the proportion of single-business firms in a sample. Studies that exclude single-business firms, or that define businesses narrowly, estimate mark-

two points (twice the standard deviation) is 167.1 (83.55 × 2), 10 percent of which is 16.71.

[28] Although the estimates of top management effects include single-business as well as multiple-business firms, factors such as selection of key personnel, determination of compensation systems, and managerial style may all form the purview of top management in single-business as well as multiple-business firms. Therefore, the estimated CEO effect derived from single-business firms should have some (but obviously not complete) similarity to the CEO effect derived from multiple-business firms.

edly higher corporate effects. Additionally, variance component analyses that omit the covariance between corporation and industry may insufficiently account for an important effect of corporate strategy, since the covariance in part reflects corporate choices of industries in which to participate. As a result, even low estimates of corporate effects may be consistent with an important impact of corporate strategy on profitability.

Third, despite these drawbacks, all of the studies in Table 1 except Schmalensee (1985) and Rumelt (1991) contain non-negligible estimates of corporate effects. This empirical evidence that corporate effects are non-trivial suggests, in contrast to the revisionist view, that firm resources affect competitive advantage and disadvantage not only at the business level but also at the corporate level. Additionally, the earlier leadership studies provide evidence of substantial effects of top management on the variance of profitability. By implication, corporate strategic management matters in explaining the variance of profitability.

Finally, the variance decomposition studies measure the corporate effect as a percent of the variance of profitability. Most of the studies do not directly address the issue of whether corporations make businesses 'better off' (Porter, 1987) in terms of earning larger returns than standalone businesses.[29] Nevertheless, a few of the studies contain evidence relevant to the better-off issue. For example, the negative covariance between corporation and industry found by McGahan and Porter (1997) suggests that corporations may make businesses better off when the businesses are in poorly performing industries. A related study by McGahan (1999) also suggests that a steady increase in the extent of relatedness in diversification between 1981 and 1994 may have resulted from changes that favored the use of arms-lengths relationships such as alliances, rather than from any detrimental effects of corporations on the level of profitability. Thus, the relationship between corporate strategy and firm performance in diversified firms may be more complex than that suggested by studies showing that diversified firms perform less well than single-business firms (e.g., Lang and Stulz, 1994).

Future research

Where do we go from here? We suggest three complementary approaches. First, insofar as possible, estimate corporate effects using variance decomposition such that the estimates more accurately reflect these effects in multiple-business firms. Second, add top management effects and variables that reflect explicit changes over time in corporate strategy to variance decomposition studies. Third, decompose the corporate effect into its underlying sources using regression techniques. An explanation of each approach follows.

With regard to estimation of *corporate* effects using variance decomposition, we recommend that studies exclude single-business firms. Industry and business effects estimated in this manner of course apply only to multiple-business firms, rather than to the economy as a whole.[30] It seems reasonable, however, to ask whether corporate influence matters in firms in which it could possibly matter, i.e., in multiple-business firms.

Additionally, the broad definition of industries and businesses inherent in a large, accessible data base like Compustat poses a difficult problem. One alternative is to obtain other data. For example, more detailed data on particular industries that scholars or consultants may have acquired in the course of their research, perhaps via surveys, might allow for an accurate breakdown of returns within more narrowly defined industry segments. We also advocate inclusion in variance components studies of the covariance between corporate and industry effects, but note that this may be difficult to accomplish using standard statistical packages.[31]

[29] Although the data in the variance decomposition studies might be used to compare the average level of individual business performance in multiple-business vs. single-business firms, the studies neither conduct such analyses nor publish data that enable the reader to make clear inferences about levels of return.

[30] Exclusion of single-business firms from the analysis may change the composition of industries in the sample, and therefore may alter the estimated industry effect from that estimated for the overall population of firms (McGahan and Porter, 1998). As noted earlier, however, the relevant standard for assessing the importance of corporate strategy is whether or not the corporate effect is non-negligible, rather than the relative sizes of corporate versus industry and business effects.

[31] Estimation of this covariance utilizes industry average returns for all firms in the sample. Analyses that exclude single-business firms in estimating the corporate effect, as we have advocated, therefore require data on industry average returns derived from a sample of both single- and multiple-business firms in order to properly estimate the corporate–industry covariance effect.

In addition to the foregoing steps, variance decomposition studies that include multiple years of data could gain additional information about the effects of corporate strategy by estimating not only stable corporate effects, but also the effects of differences over time in top management, as in the leadership studies. Studies also could incorporate the effects of specific changes in corporate strategy initiated by corporate management, such as changes in organizational structure.

Finally, regressions that decompose the corporate effect into variables which represent different possible underlying sources of the corporate effect would serve as a useful complement to variance decomposition studies. James (1997) takes this approach, and finds large corporate and large business effects.

Although a careful analysis of the variance decomposition studies as a group suggests that corporate effects are non-negligible, these studies raise complex statistical issues. We have addressed only some of these here. Many of the studies discussed previously deal in detail with nuances of technique and data analysis, to which we refer the interested reader. In addition, our analysis has focused primarily on corporate effects. The variance decomposition studies also deal with industry and business effects, a detailed analysis of which is beyond the scope of this article.[32] In fact, the early studies by Rumelt (1991) and Schmalensee (1985) emphasized the debate about the relative importance of industry and business. Our arguments instead have aimed to dispel the view that corporations don't matter. To the contrary, managers, consultants, and academics that deal with corporate strategy are not wasting their time.

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[32] See McGahan and Porter (1998) for a comparison of the findings of Schmalensee (1985), Rumelt (1991), Roquebert *et al.* (1996) and McGahan and Porter (1997) regarding these other effects.

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