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BUREAUCRACY, ECONOMIC REGULATION, AND THE INCENTIVE LIMITS OF THE FIRM

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This paper uses a transactions cost perspective to examine the development of organizational tendencies that plague the governance of unregulated subsidiaries by regulated parent companies. By focussing on what Williamson (1985) calls the 'incentive limits' of firms, conditions that should exacerbate the problems facing these firms as they diversify are identified. Empirical testing of hypotheses drawn from this discussion is conducted using a sample of nonutility, nonregulated subsidiaries of 54 electric utilities. The analysis, using both linear regression and event history methods, confirms the connection between the characteristics of the regulated parent company and subsidiary performance. The paper concludes with a discussion of how further research might extend the state of knowledge on the topic of the economic losses of bureaucracy.

How does a bureaucratic legacy affect a firm's movements into new, more spirited, domains? What administrative attributes can be linked to the ability or inability to succeed in these new fields? This paper attempts to confront these questions by exploring the governance of unregulated subsidiaries situated within regulated parent companies. The research aims to contribute to our understanding of transaction-cost economics in an intraorganizational setting and to shed light on the ability of firms to reproduce the market's strong incentives.

In addressing this question, I focus on the expansion of regulated firms into unregulated businesses, a fortuitous setting for several reasons. First, the analysis extends the literature on the interface between public policy and strategy, a relatively neglected area. It is also timely because regulated firms, especially public utilities, have been pouring enormous resources into diversification in recent years. Pacific Gas and Electric Company, for example, announced in 1989 that it would invest $2 billion in nonutility areas during the 1990s (Watson, 1989). But most importantly, this setting spotlights the staying power of a bureaucratic organizational style, and how it hampers the ability of the firm to successfully enter new strategic domains.

INTERNAL GOVERNANCE, BUREAUCRATIC COSTS, AND PATH DEPENDENCIES

Since the emergence of organizational economics around 1970 (Alchian and Demsetz, 1972; Arrow, 1974; Williamson, 1967), the comparative study of markets, hierarchies, and intermediate organizing mechanisms for exchange has flourished. In this theoretical and empirical literature, organizational economics has focussed primarily on the benefits of internal governance over the market, examining the conditions under which intrafirm transactions should supplant market transactions (e.g. Anderson and Schmittlein, 1984; Joskow,

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1985; Monteverde and Teece, 1982). Given constant production costs, this occurs if the net costs of internal (or bureaucratic) governance are below external (or market) governance costs. And the converse occurs when bureaucratic costs exceed market governance costs. But this exact cost comparison, with one exception (Masten, Meehan, and Snyder, 1991), has never been scrutinized empirically. Even more fundamentally, it is still unclear from where these bureaucratic costs arise.

A close reading of Williamson's (1975, 1985) seminal works reveals consistent attention to the presence of bureaucratic costs, but theory on the nature of these costs remains fragmentary. His *Economic Institutions of Capitalism* includes a brief discussion of what he terms the 'incentive limits' of the firm—the factors that retard the ability of internal governance to replicate and/or transmit the strong incentives to perform found in markets, thereby limiting the advantages of integration, and thus of organizational size and scope. But a deeper understanding of the nature of these incentive limits and how they confound cost minimization is necessary. Furthermore, there is a significant anomaly with which transaction-cost economics must grapple: the empirical fact that firms differ in their ability to minimize the bureaucratic costs of in-house production. The origin of these interfirm incentive differences also remains a mystery.

Our starting point in addressing these issues is a key assumption: simply put, an organization's past elementally influences its future. The so-called path-dependency model is founded on this postulate, and tries to ascertain how history shapes industrial development. It has been applied to technological regimes, when a dominant design emerges from several candidates and once established, is successively improved. These incremental technical enhancements build upon and are constrained by the cumulative weight of know-how on that technological trajectory (Arthur, Ermoliev, and Kaniovski, 1987; Teece, 1990). Failure to possess the intellectual, physical, or other assets associated with previous generations of technology will block potential entrants from participating in future generations of the technology, as those in possession of these assets correspondingly prosper. In a way analogous to embedded technological skills, if a firm obtains any

> valuable and rare resources because of its unique path through history, it will be able to exploit those resources in implementing value-creating strategies that cannot be duplicated by other firms, for firms without that particular path through history cannot obtain the resources necessary to implement the strategy (Barney, 1991:780).

But there is more, as a path dependency presents the firm with a double-edged strategic sword. In addition to its benefits, the momentum of path dependency also deters strategic reversals at each point in time, and inhibits future strategic choices and capabilities. Although most authors have underscored the intrinsic worth of path dependencies in organizational learning and the drive to create a sustainable competitive advantage, the liabilities of these developmental imprints have been largely overlooked. For example, the historical route taken by a firm may have stripped its ability to produce a strong internal incentive system and hence, to successfully navigate its way into more competitive waters.

A case in point is our empirical focus: the electric utility industry. One of the artifacts of the managerial practices used in this closely regulated industry is a rigid organizational style. As such, its path dependency, though quite appropriate to its original purpose, has left a residue that greatly impedes success in competitive ventures. By illustrating one way that tangible incentive limits materialize, I hope to illuminate the point of intersection between transaction-cost economics and path dependent models of organizational development.

INCENTIVE DISABILITIES UNDER ECONOMIC REGULATION

Profit performance: The imprint of economic regulation

Markets and hierarchies have different comparative advantages. Markets are adept at presenting a stand-alone firm with what Williamson termed 'high-powered' incentives to perform (1985:90). In this more entrepreneurial setting, failing to attain competitive levels of performance will threaten the stand-alone firm with a harsh and possibly fatal penalty. On the other hand, the rewards for success are great; enormous returns

can and do accrue to high-performing stand-alone firms. But reproducing these high-powered incentives within a corporation is no small task. One suspects that there may be major roadblocks to doing so in the electric utility industry, given the constraints left by a history of regulation.

The regulatory culture

In fact, the drawbacks of a hierarchy in the private sector may be no more evident than in firms subject to economic regulation. Their collective tendency for non-cost-minimizing behavior is so well-documented that few observers would challenge the notion. To a great degree, this is part and parcel of the public policy bargain struck to avoid wasteful duplication of services if more than one firm was allowed in a market. In return for this guaranteed market, regulation of profit rates and prices is imposed on the monopolist, so that it cannot artificially raise prices and restrict output as it would do if granted full autonomy. In theory, this economic regulation yields an efficient allocation of resources by the regulated firms, taking advantage of scale economies and natural monopolies in their respective markets. However, due to the role of regulators and regulations, economists have argued that this historical arrangement leads to overcapitalization (Averch and Johnson, 1962), lack of operating efficiency due to cost-plus conditions (Joskow and Schmalensee, 1986), and a blunted stimulus to innovate (Capron, 1971).

Within the regulated industry, the commission that oversees the typical electric utility sets prices, certifies construction projects, determines what costs may be passed through to customers, and involves itself in numerous other decisions that are made autonomously by firms in most other industries. So fundamental is the typical commission's influence on the performance of the utility that one securities analyst argued that, 'when you buy the securities of a utility, you're buying the public utilities commission' (*Business Week*, 1979:114). Under this close relationship, environmental conditions are articulated to the industry's firms through the eyes of the commission (Post and Mahon, 1980), and not surprisingly, the organizational focus is on the regulator, not the customer. Across time, this perspective is embedded within the firm and its routines (Nelson and Winter, 1982). How might such a focus affect success patterns when the firm expands into unregulated fields?

In the view held here, regulation is not an either/or condition, but varies in intensity depending on the relative activity of the state's commission. Within the sample of electric utilities, some are continually involved in regulatory procedures, while others are given a relatively "long leash." More monitoring by regulators leads to a mentality dominated by formal decision-making, reduced entrepreneurialism, and a paternalistic attitude toward employees (Robertson, Ward, and Caldwell, 1982). These organizational encumbrances dampen the ability to motivate higher subsidiary performance.[1] Thus, the losses imposed by such a mentality (which could be called a 'regulatory hangover') may well overwhelm any economies of scope and coordinating benefits that internal governance of subsidiary operations can offer. So to the extent to which the firm's organizational routines are centered on its main constituency, its regulators, diversification becomes more problematic. Hence:

> *H1: The greater the monitoring intensity of regulatory bodies, the lower the profitability of unregulated ventures of regulated firms.*

Inattentiveness to small dollars

Large organizations often exhibit a disregard for small expenditures and losses, and few would try to disprove this notion by reference to regulated firms. In the typical firm, the level at which a decision on an expenditure is made varies directly with the size of the expenditure. Usually, the more levels of management, the greater the proposed expenditure needs to be to necessitate

[1] Having developed the argument to this point, it should be noted that this theory contrasts with an agency theory view of diversification as a diversion or a growth-maximizing strategy for managers that does not serve shareholders, interests. Here, poor performance in diversifying is rooted not in conscious or subconscious attempts by managers to pursue their own interests, but in the inability of a closely regulated company, level by level, to implement a governance structure capable of providing strong incentives to subsidiaries to perform. Thus, responsibility for poor performance lies not only in the executive suite, but in the organization as a whole.

approval at high corporate level. Bower's (1970) study of resource allocation includes a story about a corporate manager who was asked to approve a chimney costing more than $50,000, that company's limit for expenditure approval at lower levels. Upon inquiry, it was learned that an entire new (and possibly unnecessary) plant had been constructed with single purchases below $50,000. The chimney was the only indivisible item whose cost exceeded that level, prompting an investigation from the corporate offices only as the plant neared completion (Bower, 1970:15). This example shows how control loss (Williamson, 1967) occurring with additional levels of bureaucracy can confound the imposition of tight controls on subsidiaries.

By extension, not small expenditures, but small investments may elude close examination in the corporate office, especially in an industry long noted for not containing costs. First, there are limits on managerial time. Under conditions of bounded rationality (Simon, 1945), this limited time must be allocated to numerous corporate issues, including many whose import is greater than small subsidiaries. Within this context, monitoring of the performance of subsidiary managers will be at best incomplete. Arguably, the tendency to monitor managers less intensively will be greater the smaller the size of the subsidiary relative to the parent.[2]

Second, managers of subsidiaries usually are salaried employees of the firm, and less likely to derive a significant portion of their compensation from performance-related incentives than if they were the top manager of a like stand-alone enterprise. For this reason, agency problems (Jensen and Meckling, 1976) will be magnified the smaller the subsidiary, as the decreased monitoring just discussed weakens the pressure to perform. This discussion suggests that:

H2: The profitability of subsidiaries of regulated firms will be greater as the relative size of a subsidiary compared to its parent rises.

[2] There is no direct analogue to this phenomenon within the market, where managers generally (a) own all or a large part of the enterprise, thereby reducing agency costs, or (b) are less removed from shareholders by virtue of the fact that there are less managerial layers between owner and manager.

Strategic exit behavior: Program persistence

As argued above, regulation imbeds within firms a set of routines that militate against efficiency. According to Nelson and Winter (1982:270), 'Political and regulatory control over firms cannot provide the persuasive. . .set of value signals and incentives that is provided by consumer sovereignty in market sectors.' In particular, cost-plus conditions actually create a situation favoring the escalation of commitment to projects that have been documented in other settings by organizational behavior scholars (e.g. Staw, 1976; Ross and Staw, 1986). So, for example, it is no surprise that tight controls over the costs and schedules of nuclear power plants proved impossible to enforce.

Similarly, the functioning of high-powered incentives can be impaired when the parent is inclined to 'forgive' poor performance by a subsidiary and allow it more time to reach performance levels. The intrusion of unfounded optimism can give rise to 'persistence behavior' (Williamson, 1975:121), wherein underperforming subsidiaries are allowed to continue operations though they show little true promise of becoming profitable. To quote Williamson (1985:150):

> . . .the net benefit calculus employed by firm and market differ. Indeed, a useful definition of forgiveness, at least for the purposes of evaluating commercial transactions, is whether "excuses" are evaluated strictly with reference to pecuniary net benefit calculus or not. As between the two, the market is expected to employ a stricter pecuniary net benefit calculus than is the firm. In this sense, it is less forgiving.

Partly, the problem is that evaluating new ventures can be like grading one's own children, a process that defies impartiality. This reluctance to admit defeat characterized one of the firms in the sample, Public Service Company of New Mexico (PSNM). As one of the general partners in a land development in the southwest, it had invested heavily in a region which by the late 1980s was turning down. Showing persistent optimism by stubbornly predicting a rebound in land values, it bought out its partners in 1989, 2 years after these partners had urged it to join them in liquidating the project. Soon after closing the buyout deal, the development project was in

bankruptcy, burdened with $300 million in debt (Ward, 1990).

This discussion suggests that within an environment shaped by a history of regulation, the rate of termination of subsidiaries varies over their lifetimes. While one cannot expect an unsuccessful subsidiary to have a greatly prolonged life, given the remarks above, it certainly can be expected to go through some period of protracted optimism despite its performance. During this period, it is the beneficiary of high hopes and relatively lenient treatment by the parent company.

Thus, in opposition to stand-alone enterprises that may suffer a 'liability of newness,' (Stinchcombe, 1965) enterprises launched as subsidiaries of regulated firms may actually resist termination in early years. Following this initial optimism, as high hopes gradually fade, the parent can be expected to act more dispassionately. Under increased scrutiny, subsidiary terminations should increase in the medium term, while declining thereafter as successful subsidiaries achieve stability and profitability. So a nonmonotonic rate of death that rises from low levels in the short term, peaks in the medium term, and declines thereafter is expected. An alternative hypotheses is suggested by the liability of newness argument, that the death rate of businesses will monotonically decrease with the age of the subsidiary, in a manner analogous to that shown in studies of death rates of small businesses (Carroll and Delacroix, 1982; Freeman, Carroll, and Hannan, 1983).

H3: The death rate of subsidiaries of regulated firms will initially rise and then decline with the age of the subsidiary.

H3alt: The death rate of subsidiaries of regulated firms will decline monotonically with the age of the subsidiary.

Profit performance: Countervailing forces

Overcoming the drawbacks of a rigid hierarchy

Given that organizational phenomena influence the profitability of subsidiaries, it follows that particular organizational attributes can promote success in these ventures. The first is the use of the multidivisional form, which separates business units into independent profit centers and therefore accentuates their differentiation. As such, it serves to reduce 'bureaucratic distortions' (Williamson, 1985:148). According to Chandler (1962), this structure makes it easier to maintain separate accounts, business plans and competitive incentives. The relay of information to higher echelons tends to be more accurate under this format, limiting misinterpretations caused by serial reproduction of information (Bartlett, 1932). Thus, the types of problems with attention to small units described above should be lessened, because information travels through fewer levels of bureaucracy. Empirical support for the value of the M-form to a diversified firm has been established (Armour and Teece, 1978; Steer and Cable, 1978), indicating the following hypothesis:

H4: The use of the multidivisional structure will increase the profitability of the subsidiary.

Relatedness

A rich literature has described the benefits to diversification into fields that are related to one another (e.g. Peters and Waterman, 1982; Rumelt, 1974; Wernerfelt and Montgomery, 1988). In such a setting, the skills and know-how of the parent company can be brought to bear on the subsidiary, improving performance. Additionally, the difficulties of assessing the performance potential of the subsidiary should correspondingly lessen. Finally, the benefits of internally assessing information on new ventures (Salter and Weinhold, 1978:175) should be enhanced when the subsidiary is in a field related to the parent. Logically, one can hypothesize that for the single-business firm, a subsidiary that is related to this core business is more likely to deliver acceptable performance.[3] This discussion suggests:

H5: Subsidiaries that are related to the primary business of the parent company will outperform

[3] It should be noted here that this discussion diverges from virtually all previous studies of diversification that rely on a corporate-wide relatedness construct. Thus it fits well with the need perceived by Ramanujam and Varadarajan (1989) to shift the unit of analysis for diversification downward to individual units and projects.

those unrelated to the parent company's business.

DATA, METHODOLOGY, AND TESTING

Sample selection, data sources, and operationalization

I drew a sample of 54 privately-owned American electric utilities drawn from the 1986 population of 182 such firms. From these 182, a number of firms that had legislative restrictions on diversification and/or organizational form, several that were involved in mergers, and several others that were solely electricity generating facilities were removed. 48 of the remaining 54 firms had at least one subsidiary. The sample contains subsidiaries that: (a) were majority-owned business units,[4] (b) did not represent vertical integration,[5] and (c) were neither price nor profit regulated. A small number of acquired subsidiaries were omitted, since these are difficult to compare to start-ups in terms of performance trajectory over time. Data from 1966 through 1986 for these firms and their subsidiaries were collected for the statistical analysis.

For testing Hypotheses 1, 2, 4 and 5, return on equity was used, beginning with 1973, the first year in which equity accounting was mandated by the Federal Power Commission (FPC). This reporting statute calls for figures for equity invested in each subsidiary and the equity earned for a given year to be stated in annual reports to the FPC and its successor, the Federal Energy Regulatory Commission (FERC). Thus, the analysis used business unit data to test Hypotheses 1, 2, 4 and 5, which logically call for the dependent variable to be measured not firm-wide, but at the business unit level. In order to be included in this portion of the analysis, a subsidiary had to have at least two consecutive years of complete data, because a lagged return variable was used in the analysis. This lagged return is useful as a control variable and to impart a dynamic quality to the analysis. Due to various data being omitted from some individual report forms, continuous time series were rare. The sample was restricted to those subsidiaries that had equities of at least $1,000,000, necessitated because equity figures at lower levels proved unreliable. Also, many of the subsidiaries were established later in the study period, and so offer few observations. For this reason, and due to the lack of equity figures for some subsidiaries, the data set used for these tests draws on a subset of the subsidiaries used to test Hypothesis 3. In all, this first analysis employs 269 observations from 54 different subsidiaries.

Return data for multidivisional companies came from forms submitted to the Securities and Exchange Commission, the recipient of subsidiary return information once the utility restructures into a multidivisional form. Other tabulated data came from an annual FERC publication known as *Financial Statistics of Selected Electric Utilities* (FERC, 1988). Finally, average return figures for the SIC classifications in which the subsidiaries were active were taken from COMPUSTAT tapes.[6] Construction of the variables used in the analysis appears in the Appendix.

Data for the birth dates of subsidiaries and termination dates was used to test Hypothesis 3. Death was defined to include not only dissolution of these enterprises, but also those whose operations were sold to other companies, following Porter's (1987) view of exiting a business line

[4] Theoretically, whether or not a subsidiary is wholly-owned could influence profitability. Under shared ownership, returns to active management could be leveraged up by 'free-riding' and relying on the partner to keep the venture on course. While this would even out returns across partners, if all part owners depend on the 'other guy' to manage, then active oversight will not take place, and returns would deteriorate. However, virtually all of the subsidiaries are wholly-owned, and analyses using measures of ownership were insignificant in predicting profitability.

[5] Vertical integration consists of all operations used to procure and transport fuel to the company. Each of the firms was contacted directly to ascertain whether the majority of sales of each of their subsidiaries was to the company or not (in a few cases, the companies did not respond and secondary sources were used). If sales exceeded 50 percent, as almost all of the upstream subsidiaries did, it was considered to represent vertical integration and deleted from the study. Since some of the remaining upstream subsidiaries were regulated, and so removed from the study, most of these subsidiaries were excluded from the analysis. The 33 firm-years shown in Table 2 are mostly from transportation and communication subsidiaries, which do not represent vertical integration.

[6] For the SIC return, the following algorithm was used. If four or more firms in the 4-digit category were available, the average return for those firms was used. If three or less firms were available, the average of the 2-digit level was used. Tests of 2 and 4-digit returns yielded a high correlation (0.91) between returns measured at the two levels.

as constituting a strategic failure.[7] Finally, 5 subsidiaries that were merged or folded into other operations were deleted, on the grounds that this action may merely reflect a reorganization of existing operations, with no implications for strategic exit.

Test for hypotheses 1, 2, 4 and 5

Method

For these hypotheses, return data were pooled together into one data set.[8] In order to control for error dependencies across individuals, a fixed effects model was used (Hsiao, 1986), in which a separate dummy for each subsidiary was inserted into the model. Dummies for subsidiaries contributing a single year of data were omitted, since these dummies would be estimated to be identical to the return, removing any useful information from their inclusion. Ordinary least squares regression was then used to test the hypotheses. Descriptive statistics are presented in Tables 1, 2 and 3.

Results

Table 1 shows the number of subsidiaries affiliated with the 54 electric utilities in our data set, categorized by industrial groups, based on SIC classifications. All subsidiaries that were listed by firms on annual report forms were used in this analysis. There are longitudinal increases in every category, and the total number of subsidiaries doubled in the 5-years from 1981 through 1986. Subsidiaries formed along vertical lines, generally in Groups 1 and 3, showed steady increases over the 1966–86 period. Finance, Insurance, and Real Estate subsidiaries increased 10 fold in this period, as many firms tried to capitalize on surplus lands on hand. Subsidiaries engaged in services also rose dramatically, partly the result of the formation of ventures to offer engineering services in competitive markets in the more recent years. Finally, though small in absolute number, there were large jumps in the number of manufacturing and wholesale and retail trade subsidiaries of utilities. Thus, these firms have entered businesses of varying degrees of relatedness to their core function with varying intensities.

Table 1. Active subsidiaries by standard industrial classification sample of 54 electric utilities

Industrial group	Year				
	1966	1971	1976	1981	1986
1. Mining and construction	19	31	65	86	101
2. Manufacturing	2	4	4	3	18
3. Transportation, communication electric, gas and sanitary services	14	18	18	21	45
4. Wholesale and retail trade	3	2	2	2	14
5. Finance, insurance and real estate	9	9	13	27	94
6. Services	1	4	7	13	66
Totals	48	68	109	152	338

Table 2 compares the return on equity performance of utility subsidiaries to averages for firms matched by 4-digit SIC code, and averaged within the six Major Groups. The set of 269 subsidiaries used in this analysis is the same as that used for regression analysis of performance shown in Table 4 below. The results expose a languid track record. In no major group did the average return even reach half the average return for its SIC Group, and only Group 3 subsidiaries come close to the 50 percent level at which one would expect a typical operation to outperform its SIC average.

Table 3 displays the means and a correlation table for the variables used for the first portion of the study. The high variability of the return figure is probably due to its being a ratio variable, which can result in greater swings across time

[7] The sale of a subsidiary does not always indicate competitive failure. Instead, it may be the result of (1) the need to raise cash at the corporate level or (2) the need to trim operations in order to avoid a so-called bust-up acquisition. However, for the industry under consideration, neither of these possibilities was likely to be in force during the study period. First, none of the companies underwent crisis conditions. Second, for regulatory reasons, hostile takeovers generally are difficult in this industry.

[8] An issue here is whether it is proper to pool this data. While the variable intercepts described below should control for changes from venture to venture, another issue is whether the coefficients are stable across time. Because not all subsidiaries contribute the same number of years to the analysis, a resolution of this question is exceedingly complex. However, to obtain some insight on the issue, the data was split into two approximately equal halves, based on 1982 and beyond and 1981 and previous years. The general pattern of the coefficients changed little, although with a smaller N, significance levels suffered slightly. The net result of these analyses was confidence that pooling was warranted.

Table 2. Comparison of returns on equity: Sample of 269 annual returns of electric utility subsidiaries

Industrial group	*N*	Average subsidiary return	Average SIC return	Percentage of subsidiary returns exceeding avg. SIC return
1. Mining and construction	89	0.29%	12.62%	6.7%
2. Manufacturing	6	2.30	13.14	0.0
3. Transportation, communication, electric, gas and sanitary services	33	6.03	12.07	39.4
4. Wholesale and retail trade	0			
5. Finance, insurance and real estate	100	4.11	9.24	21.0
6. Services	41	6.44	13.00	26.8
Totals	269	3.40%	11.37%	19.0%

Table 3. Descriptive statistics and Pearson correlation coefficients[a,b,c]

	Mean	Std Dev.	Correlation coefficients 1.	2.	3.	4.	5.
1. Return on equity (percent)	3.40	16.03					
2. Size relative to parent (percent)	1.58	2.80	0.16				
3. Regulatory intensity	0.44	0.38	−0.04	0.47			
4. Organizational form (1=MDF)	0.12	0.32	−0.08	−0.06	−0.08		
5. Related business (1=Related)	0.23	0.42	0.08	−0.02	0.02	0.02	
6. Average SIC return (percent)	11.37	4.94	0.02	0.00	−0.01	−0.03	0.02

[a]*N* is total number of subsidiary-years, 269.
[b]With panel data, correlations computed by pooling all observations results in greatly overstated significance levels, because multiple observations on a given relationship are included. Therefore, one year for each subsidiary in the study was randomly chosen and those observations were pooled. Correlation coefficients and significance levels were computed using this data; results appear above.
[c]Correlations at or above 0.27 are significant at the 5% level.

than say, either the quotient or divisor that constitute it. Also worth noting is the average relative size of individual subsidiaries, about 1.6 percent of the size of the core business, showing the parent's continued dominance.

Table 4 shows the results of the regression analysis. The total amount of variance in the rate of return explained by the regression is modest, possibly due to the use of a ratio measure for the dependent variable. The lagged dependent variable is significant, though it deviates considerably from the neighborhood of unity, what one might expect for such a regression. Extensive diagnostics revealed no outliers on this measure, but did show a wide range of values. The grand mean of the dependent and lagged variable are 3.4 percent and 3.7 percent, respectively, with median values of 1.3 percent and 1.4 percent, respectively, indicating that the wide dispersion of the values may be linked to this pattern of

Table 4. Regression results: Determinants of return on equity[a]

	(1)	(2)
Constant	−0.335	−0.533
	(4.765)	(5.153)
Lagged rate of return	0.198**	0.197**
	(0.062)	(0.062)
Size relative to parent	1.152**	1.153**
	(0.423)	(0.424)
Regulatory intensity	−5.960*	−5.961*
	(2.845)	(2.860)
Organizational form	−6.413	−6.378
	(3.658)	(3.682)
Related business	−0.978	−1.056
	(6.163)	(6.223)
Average SIC return		0.021
		(0.207)
R^2	0.275	0.271

[a]N=269. Standard errors in parentheses; significance tests are two-tailed. *$p < 0.05$, **$p < 0.01$.

coefficients. Another reason for its low value is the tendency for the presence of dummy variables to lower the coefficient in fixed effects models such as this one (Hannan and Young, 1977).

Regulatory intensity influences profitability. Involvement with oversight activities, though small in terms of dollars spent, is indicative of a culture which might find rigorous competition a foreign concept. The findings validate the notion that the regulatory influence is not uniform; they manifest gradations in the degree of focus on regulators.

As hypothesized, the size relative to the parent is a significant predictor of success. It appears that managerial attentiveness to performance declines as the size of potential losses declines. This is consistent with a view of managerial talent as a scarce good whose allocation is based on prospective returns across the many issues and projects in need of oversight. As such, the smaller the subsidiary (in relative terms), the less likely it is to receive active scrutiny. This finding also may reflect the avoidance of political conflict when returns to a 'tough decision' are small.

Neither the presence of the divisional structure nor the relatedness of the subsidiary has significant explanatory power in this model. The finding with respect to the M-form is intriguing. Given that these firms are dominated by the core business, possibly the administrative costs of the M-form that accrue to individual subsidiaries negate any efficiency gains. Another alternative is that since several firms adopted the M-form relatively late in the study period, the structure was not equally activated across all firms. In any case, the operational efficiencies attributed to the adoption of the M-form have yet to materialize in this industry.

The finding that relatedness was not significant counters the expectations presented above. There are two possible explanations for this. First, the fact that these subsidiaries operate in competitive—not regulated—markets may represent a distinction with the parent company so fundamental that it would overwhelm how related the subsidiaries business was to the regulated parent. The second reason follows from the peculiar problems that entering related fields pose for the regulated firm. While most firms look for opportunities to share costs between related ventures, when unregulated ventures share costs with the regulated parent, regulators are apprehensive about the incentive to push those common costs onto the regulated (i.e. monopolistic) operation. Thus, these firms often cannot avail themselves of the efficiencies attributed to related diversification. In fact, some firms have scrupulously avoided related businesses, in one case espousing a strategy of '*minimizing interaction between the utility and* its unregulated affiliates by diversifying into businesses which do not need utility assets, people, or monopolistic power' (Levitin, 1985).

Because return figures may track industry levels, the second equation includes a control for the average SIC return for the industry in which the subsidiary was situated. As can be seen, this average return is not related to subsidiary profitability. Other analyses (not shown) to control for a profit trajectory that rose from early start-up years to industry levels in later years also added little explanatory power.

Hypothesis 3 test

Method

To test Hypothesis 3, competing models of the pattern of subsidiary deaths across time (known as the age-dependence of death) had to be fit to the data. Event history models that assumed two different distributions of death rates over time

were compared: a lognormal model, in which deaths rise from early time periods to a peak in some middle year and then decline thereafter, and a Weibull model in which deaths rise or decline monotonically with time.[9] The hazard rate h(t), which describes the rate of death across time, was used to model this phenomenon. The two distributions are:

$$\text{LogNormal } h(t) = \frac{\exp-[(\log(t)-\mu)^2/2\sigma^2]}{((\sqrt{2\pi})\sigma t)[1-\phi((\log(t)-\mu)/\sigma)]}$$

$$\text{Weibull } h(t) = \rho e^{-\alpha\rho} t^{\rho-1}$$

where ϕ is the cumulative distribution function for the normal distribution.

Both of the models are based on two parameters, the estimation of which is the object of regressions to be run. Once these parameters are estimated, the specific characteristics of the curves will be known. For the log-normal, the coefficients can only be interpreted in a general manner. For our purpose, it is important to note that the greater the estimate for μ, the less pronounced is the rise in the middle years and the later the peak in the death rate occurs. For the Weibull, ρ describes how the function changes with time. It is constrained to be greater than zero, and describes the hazard as an increasing one with time when $\rho > 1$ or decreasing when $\rho < 1$. h(t) varies directly with σ, a scale parameter. When $\rho = 1$, the hazard rate is a constant number, $e^{-\alpha}$, representing an exponential distribution. The SAS procedure LIFEREG was utilized to analyze and compare the fit of these two distributions to rates of death derived from the data set. The set contained information necessary to conduct an analysis for 219 subsidiaries, 28 of which were terminated during the study period. The remainder were considered right-censored, a statistical element that LIFEREG is designed to accommodate.

[9] According to Tuma and Hannan (1984:220), the Weibull model can be expected to provide results similar to other monotonic distributions. Its advantage is that it and the lognormal distribution can be directly compared using the gamma function.

Results

Table 5 shows the results of the analysis to test Hypothesis 3. The first set of estimates is for the lognormal hazard rate; Figure 1 shows the estimated curve based on this distribution. The hazard rate first rises, then declines, as hypothesized. In order to test the validity of this result vs. the nonmonotonic model suggested by the alternative hypothesis, I also estimated a Weibull model, the second one shown in Table 5. The fact that it estimates an increasing hazard function is probably due to a larger number of observations in the early years. The most important question is whether or not there is a statistically significant drop in the overall fit to the data. The two models can be compared by computing a third model, a three parameter Gamma model. Because both the Weibull and the lognormal are special cases of the Gamma, it can be used to discriminate between the two (Lawless, 1982).[10] The third section of Table 5 shows that a log likelihood test comparing the Gamma and lognormal models shows that the extra parameter associated with the full Gamma model does not represent a significant improvement of the lognormal distribution in this case. On the other hand, a comparison of the lognormal with the Weibull model confirms that the lognormal is a highly significant improvement over the Weibull. Thus, this analysis clearly supports Hypothesis 3 over its alternative and illustrates the presence of a honeymoon period for new subsidiaries.[11]

[10] To properly conduct this test, a sequential strategy is needed. First, one runs three regressions based on a Gamma distribution: one unconstrained, one constrained to correspond to a lognormal model, and one constrained to the Weibull model. Second, intermediate values of the parameter p in the generalized Gamma function (see Kalbfleisch and Prentice, 1980:27) between 0 (lognormal), 1 (Weibull), and the value given by the unconstrained Gamma model must be tested to ensure that the likelihood function across all three values is well-behaved. If this is true, standard log-likelihood techniques can be used to make conclusions about the propriety of the two special cases.

[11] One issue that can be raised at this point concerns the fact that in the regressions, the influence of causal variables other than age are not controlled. The main variable that could confound the results is size, since with time subsidiaries grow and acquire resources, making them less vulnerable to downturns and unexpectedly high costs. I considered this issue in two ways. Arguably, in a subsidiary relationship, the resources of the parent would be the crucial variable, since the parent can provide sustained support to its subsidiary. On the other hand, the resources of the subsidiary cannot be ignored. Both of these possibilities were examined with

Table 5. Regression results comparison of death rate models[a]

Log normal distribution of death rate		
Constant, μ	3.409***	
	(15.710)	
Scale term, σ	1.245***	
	(8.459)	
Log likelihood ratio		−76.16***
Weibull distribution of death rate		
Constant, α	3.810***	
	(20.342)	
Scale term, ρ	1.189***	
	(8.698)	
Log likelihood ratio		−79.87***
Comparison of models		
Log Likelihood Ratio, Gamma distribution		−74.60***
2×LL(Gamma −2×LL(Lognormal)		3.12
2×LL(Gamma) −2×LL(Weibull)		10.54***

[a]The number of spells was 219, including 191 censored spells. Numbers in parentheses are parameter estimates divided by standard errors; significance tests are two-tailed.
**$p < 0.01$ ***$p < 0.001$.

DISCUSSION AND CONCLUSION

In 1935, economist J. R. Hicks opined that 'The best of all monopoly profits is a quiet life' (1935:8). The remark punctuated a commentary on how the lack of business rivalry softens utility managers, allowing them to avoid conflict-creating decisions in favor of slightly suboptimal performance. I have argued that under regulation, this lack of vigor permeates the entire company, engendering tangible bureaucratic distortions.

Like old dogs, many mature firms can't be taught new tricks. And as suggested in this article's opening section, one can argue that the historical paths taken by electric utilities have imbued them with a set of routines wholely inappropriate to competitive ventures. This path dependency, though it may have served the central business well in the decades through which it evolved, makes the reproduction of the market's high-powered incentives a near-impossibility. This is manifested on several organizational dimensions.

Support for Hypothesis 1, that intense regulatory oversight would restrain profitability in new ventures, indicates that cultural incompatibilities can jeopardize these efforts to branch out. While this has often been acknowledged in the study of acquisitions (e.g. Deal and Kennedy, 1982), this analysis suggests that internal expansion suffers in analogous ways, if the start-ups are controlled by managers endowed with the regulatory perspective. Years of regulatory oversight apparently leave a deep imprint on an organization, resulting in what Scott (1987:301) refers to as 'overconformity'—a dysfunctional effect of the procedural rigidity associated with reliability in the utility sector. This finding may generalize to explain failures to expand into industries with different intensities of compe-

two separate event history models that added in the first case, the average equity of the parent and in the second case, the equity of the subsidiary as an independent variable in addition to age. To do this, the average firm-wide equity for the life of the subsidiary was used. For subsidiary equity, the average for years 1973 through 1986, the only years for which that figure was available, were used. This approach is crude, but allowed me to consider in a substantive way the question of whether size affects the hazard rate. Another approach, breaking the data up into 1 year spells, could not be done reliably because of the sparsity of subsidiary equity figures. However, the analysis indicated that neither the parent's nor subsidiary's equity level had a more significant effect on the hazard rate.

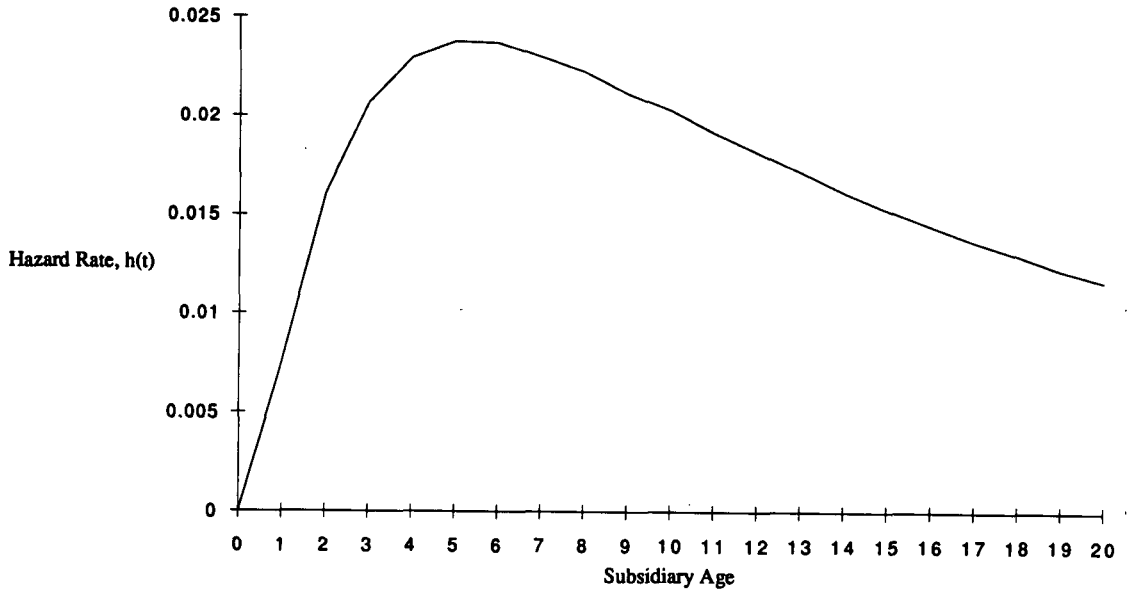

Figure 1. Death rates, lognormal model.

tition; firms expanding into markets characterized by more rigorous competition may typically encounter adversity. Or perhaps, when the industry entered is increasingly more competitive than a company's parent, the viability of acquisition as an entry vehicle is enhanced. In this way, the problems just cited may be mitigated.[12]

Judging by the results of the analysis, regulated firms have difficulties presenting smaller subsidiaries with durable incentives to perform. Hypothesis 2, that the larger the subsidiary in comparison to its parent, the better the performance, was validated. This result suggests that 'intrapreneuring' that fosters infant research and development projects within a large parent faces similar (and potentially severe) hurdles to success. The results in regard to the relative size variable also point out one of the deficiencies of linear regression, since if one takes our results at face value, then these firms should create larger subsidiaries to enhance profitability. Logically, there is some point at which the returns to increasing size diminish, but this point lies outside the range of available data, which contains subsidiaries that generally have equity levels of a percentage or two of those of the parent. If this general schema prevails, however, it presents regulated firms deciding to diversify with a tough decision, since starting small, though limiting sunk costs if the move proves catastrophic, tends to limit profitability (Biggadike, 1979).

A provocative result emerged from the support for Hypothesis 3, which posited the presence of a 'honeymoon effect,' during which the death rate of subsidiaries rises from an initially low level, peaks in the mid-term, and then declines asymptotically. This age dependency of death rates begs comparison with population ecology studies finding a liability of newness apparent in populations of small organizations in like environments (e.g. Carroll and Delacroix, 1982; Freeman *et al.*, 1983). On the one hand, the comparison is indirect, since the unit of analysis in those cases is the organization itself, not a subunit of the organization. On the other hand, this context is central to transactions cost economics, which places transactions that are organized within markets and within hierarchies in a common and comparative light. These results

[12] AT&T's sequential moves into computer sales through internal expansion, a joint venture, and finally the acquisition of NCR Corporation illustrate the slow recognition that lessened parent company involvement with a highly competitive industry was a painful necessity.

at least suggest that internal governance imparts a different probability of death on the newly-launched venture. Levinthal and Fichman (1988) analyzed the duration of auditor-client relationships and found a similar honeymoon period, which they contended was due to 'an initial stock of goodwill, financial resources, and feeling of commitment on the part of the critical participants (1988:367).' The results of this analysis agree with that study and validate that a honeymoon exists at the *intra*organizational level.

I propose that as a subsidiary's initial stock of goodwill dissipates, decisions on continuing operations are more likely to employ rigorous analysis using a now-established track record. In this way, the methods used by the firm and the market to conduct their respective 'net benefit calculus' would converge at later stages in the life of an enterprise. Taking the argument one logical step further, perhaps when the suppression of death rates caused by this honeymoon effect is subtracted from the curve shown in Figure 1, one is left with the more familiar monotonically downward curve found by Carroll and Delacroix (1982) and Freeman *et al.* (1983). If that is so, then possibly the age dependency found by the population ecologists is a *special case* of the more general one, special because in their case, the initial stock of goodwill is negligible.[13] For other, somewhat larger stand-alone enterprises, there does appear to be some goodwill, as evidenced by nonmonotonic death rates found in more recent studies of stand-alone enterprises (Singh, House, and Tucker, 1986; King and Wicker, 1988; Carroll and Huo, 1988). Put together, the empirical evidence means that either: (a) honeymoons are ubiquitous, and the findings of a liability of newness are due to statistical techniques used in early studies (Fichman and Levinthal, 1991); or (b) the early studies focused on very small, unique types of businesses especially vulnerable to early death. Regardless of whether goodwill exists for small, highly competitive ventures, the point is that the firms provide an initial stock of goodwill to new subsidiaries, and that this goodwill is likely to be much larger and have more staying power than the boundaries of regulated firms.

Do the results presented here apply to a broader class of firms? This paper has argued that regulated firms are subject to perverse cost incentives, are guilty of maintaining a focus on regulators, and are bureaucratically burdened. While the first two of these problems are peculiar to the industry, the last is not. On the contrary, this tendency appears to plague many large firms, especially those dominated by single, mature, business. There is corroborating evidence. Firms in mature product-markets were characterized as having weighty administrative devices by Smith and Cooper (1988), who found that this maturity impaired the performance of subsidiaries of those firms in young industries. And anecdotal evidence bolsters this finding, as evidenced by studies of Exxon's disastrous push into office automation (Sykes, 1986), and General Motors's equivocal management of its Frigidaire appliance subsidiary (Burton and Kuhn, 1979, cited in Williamson, 1985:288). So future research that tried to sort out the various causes of bureaucratic failures and balance one against the other would be extremely valuable. Such a research program would yield the greatest gains if it compared and contrasted firms in competitive markets using measures of size, age, degree of single-business myopia, and competitive pressure, as well as different developmental histories. The issue is this: how heavily do each of these factors (or combinations thereof) weigh in producing incentive limits? The answer to this question will determine the extent to which the results presented here can be generalized.

A number of other longitudinal studies would address important questions suggested by this analysis. One could focus on how similar firms develop along dissimilar paths. For example, some of the firms in our study refused to diversify while others within the same state pushed aggressively outward. Another study would explore how firms differ in their ability to generate high-powered incentives, and hence explain how firm boundaries develop differently across time. Consider two basically single-business firms in the automotive industry, General Motors and Ford. Monteverde and Teece (1982) hypothesized and then proved that greater

[13] Of course, to fully compare the two paradigms, the models would need to be parameterized with causal models other than age itself. The suggestion here is that the issues of age dependency addressed by the two can be put in common terms. As an added note, greater attention to the proper unit of age is necessary; had age been measured in decades rather than years, evidence of a liability of newness would have resulted.

engineering know-how in designing a part (and hence higher transaction costs in contracting for its fabrication by an outside supplier) would increase the probability that an automotive part would be produced in-house. But in a study of 129 parts, in 31 percent of the cases the parts in question were produced in-house by one manufacturer but not the other. History and path dependencies may well explain this apparent anomaly; if so, an important gap in transaction-cost theory may be bridged. Inquiries such as the ones just mentioned would also be valuable in generating a strategic management research base that is more longitudinal, redressing the field's traditional reliance on cross-sectional methodologies (Summer *et al.*, 1990:380).

A natural complement to the present study of incentive limits would compare subsidiaries of bureaucratic firms to stand-alone firms operating in like environments. Then, researchers could examine the variability of the effects within firms and compare these variations to those that occur when activities take place in independent firms. This in turn would allow researchers to answer a simple but absolutely pivotal question: how much variation in incentives are firms capable of generating?

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REFERENCES

Alchian, A. and H. Demsetz, 'Production, information costs, and economic organization'. *American Economic Review*, **62**, 1972, pp. 777–795.

Anderson, E. and D. C. Schmittlein. 'Integration of the sales force: An empirical examination'. *The Rand Journal of Economics*. **15**, 1984, pp. 385–395.

Arrow K. J. *The Limits of Organization*, Norton, New York, 1974.

Arthur, W. B., Y. M. Ermoliev and Y. M. Kaniovski. 'Path-dependent processes and the emergence of macro-structure', *European Journal of Operational Research*. **30**, 1987, pp. 294–303.

Armour, H. O. and D. J. Teece. 'Organizational structure and economic performance: A test of the multidivisional hypothesis', *Bell Journal of Economics*, **9**, 1978, pp. 106–121.

Averch, H. and L. Johnson. 'Behavior of the firm under regulatory constraint', *American Economic Review*, **52**, 1962, pp. 1052–1069.

Barney, Jay. 'Firm resources and sustained competitive advantage', *Journal of Management*, **17**, 1991, pp. 771–792.

Bartlett, F. C. *Remembering*, The University Press, Cambridge, U.K. 1932.

Biggadike, R. 'The risky business of diversification', *Harvard Business Review*, **57** (3), 1979, pp. 103–111.

Bower, J. *Managing the Resource Allocation Process*, Division of Research, Harvard Business School, Boston, MA, 1970.

Burton, R. H. and A. J. Kuhn. 'Strategy follows structure: The missing link of their intertwined relationship', Working Paper 260, Fuqua School of Business, Duke University, May 1979.

Business Week. 'A dark future for utilities'. May 28, 1979, pp. 108–122.

Capron, W. M. (ed.) *Technological Change in Regulated Industries*, Brookings, Washington, DC, 1971.

Carroll, G. R. and J. Delacroix. 'Organizational mortality in the newspaper industries of Argentina and Ireland: An ecological approach', *Administrative Science Quarterly*, **27**, 1982, pp. 169–198.

Carroll, G. R. and Y. P. Huo. 'Losing by winning: The paradox of electoral success by organized labor in the Knights of Labor Era'. In G. R. Carroll, (ed.), *Ecological Models of Organization*, Ballinger, Cambridge, MA, 1988. pp. 175–193.

Chandler, A. D. *Strategy and Structure*, MIT Press, Cambridge, MA, 1962.

Deal, T. E. and A. A. Kennedy. *Corporate Cultures: The Rites and Rituals of Corporate Life*, Addison-Wesley, Reading, MA, 1982.

Federal Energy Regulatory Commission. *Financial Statistics of Selected Electric Utilities*, Federal Energy Information Administration, Washington, DC, 1988.

Fichman, M. and D. L. Levinthal. 'Honeymoons and the liability of adolescence: A new perspective on duration dependence in social and organizational relationships'. *Academy of Management Review*, **16**, 1991, pp. 442–468.

Freeman, J., G. R. Carroll and M. T. Hannan. 'The liability of newness: Age dependence in organizational death rates', *American Sociological Review*, **48**, 1983, pp. 692–710.

Hannan, M. T. and A. A. Young. 'Estimation in panel models: Results on pooling cross-sections and time series'. In D. R. Heise, (ed.), *Sociological Methodology*, pp. 52–83, Jossey-Bass, San Francisco, CA, 1977.

Hicks, J. R. 'Review of monopoly', *Econometrica*, 3, 1935, pp. 1–20.

Hofer, C. W. and D. Schendel. *Strategy Formulation: Analytical Concepts*, West Publishing, St. Paul, MN, 1978.

Hsiao, C. *Analysis of Panel Data*, Cambridge University Press, New York, 1986.

Jensen, M. and W. Meckling. 'Theory of the firm: Managerial behavior, agency costs, and capital structure', *Journal of Financial Economics*, **3**, 1976, pp. 306–360.

Joskow, P. L. 'Vertical integration and long-term contracts: The case of coal-burning electric generating plants', *Journal of Law, Economics, and Organization*, **1**, 1985, pp. 33–80.

Joskow, P. L. and R. Schmalensee. 'Incentive regulation for electric utilities', *Yale Journal on Regulation*, **4**, 1986, pp. 1–50.

Kalbfleisch, J. D. and R. L. Prentice. *The Statistical Analysis of Failure Time Data*, Wiley, New York, 1980.

King, J. C. and A. W. Wicker. 'The population demography of organizations: An application in retail and service establishments'. In F. S. Hoy (ed.), *Academy of Management Best Papers Proceedings*, 48th Annual Meeting, 1988, pp. 373–377, Anaheim, CA.

Lawless, J. F. *Statistical Models and Methods for Lifetime Data*, 1982, Wiley, New York.

Levinthal, D. A. and M. Fichman. 'Dynamics of interorganizational attachments: Auditor–client relationships', *Administrative Science Quarterly*, **33**, 1988, pp. 345–369.

Levitin, L. A. Statement on Behalf of Pacific Lighting Corporation at hearings on Utility Diversification before the California Public Utilities Commission, 1985.

Masten, S. E., J. W. Meehan and E. A. Snyder. 'The costs of organization', *Journal of Law, Economics, and Organization*, **7**, 1991, pp. 1–25.

Monteverde, K. and D. J. Teece. 'Supplier switching costs and vertical integration in the automobile industry', *Bell Journal of Economics* **13**(1), 1982, pp. 206–213.

Nelson, R. R. and S. G. Winter. *An Evolutionary Theory of Economic Growth*, Belknap-Harvard, Cambridge, MA, 1982.

Peters, T. J. and R. H. Waterman, Jr. *In Search of Excellence*, Harper and Row, New York, 1982.

Porter, M. E. 'From competitive advantage to corporate strategy', *Harvard Business Review*, May–June, 1987, pp. 43–59.

Post, J. E. and J. F. Mahon. 'Articulated turbulence: The effect of regulatory agencies on corporate responses to social change', *Academy of Management Review*, **5**, 1980, pp. 399–407.

Ramanujam, V. and P. Varadajaran. 'Research on corporate diversification: A synthesis', *Strategic Management Journal*, **10**, 1989, pp. 523–552.

Robertson, T. S., S. Ward and W. Caldwell IV. 'Deregulation: Surviving the transition', *Harvard Business Review*, **60**(4), 1982, pp. 20–21.

Ross, J. and B. M. Staw. 'Expo 86: An escalation prototype', *Administrative Science Quarterly*, **31**, 1986, pp. 274–297.

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

Salter, M. S. and W. A. Weinhold. 'Diversification via acquisition: Creating value', *Harvard Business Review*, July–August, 1978, pp. 166–176.

Scott, W. R. *Organizations: Rational, Natural and Open Systems*, 2nd edn. Prentice-Hall, Englewood Cliffs, NJ, 1987.

Simon, H. A. *Administrative Behavior*, Macmillan, New York, 1945.

Singh, J. V., R. J. House and D. J. Tucker. 'Organizational change and organizational mortality', *Administrative Science Quarterly*, **31**, 1986, pp. 587–611.

Smith, C. G. and A. C. Cooper. 'Established companies diversifying into young industries: A comparison of firms with different levels of performance', *Strategic Management Journal*, **9**, 1988, pp. 111–121.

Staw, B. M. 'Knee-deep in the big muddy: A study of escalating commitment to a chosen course of action', *Organizational Behavior and Human Performance*, **16**, 1976, pp. 27–44.

Steer, P. and J. Cable. 'Internal organization and profit: An empirical analysis of large U.K. companies', *Journal of Industrial Economics*, 1978, pp. 13–30.

Stinchcombe, A. L. 'Social structure and organizations'. In J. G. March, (ed.), *Handbook of Organizations*, pp. 153–193, Rand McNally, Chicago IL, 1965.

Summer, C. E., R. A. Bettis, I. H. Duhaime, J. H. Grant, D. C. Hambrick, C. C. Snow and C. P. Zeithaml. 'Doctoral education in the field of business policy and strategy'. *Journal of Management*, **16**, 1990, pp. 361–398.

Sykes, H. B. 'Lessons from a new venture program', *Harvard Business Review*, July–August, 1986, pp. 69–74.

Teece, D. J. 'Contributions and impediment of economic analysis to the study of strategic management', In J. W. Frederickson, (ed.), *Perspectives on Strategic Management*, pp. 39–80, Harper Business, New York, 1990.

Tuma, N. B. and M. T. Hannan. *Social Dynamics: Models and Methods*, Academic Press, New York, 1984.

Ward, L. B. 'A reckoning for the utility high rollers', *New York Times*, July 19, 1990, III–4.

Watson, L. 'PGandE's $2 billion non-utility investment',*San Francisco Chronicle*, February 2, 1989, p. C1.

Wernerfelt, B. and C. A. Montgomery. 'Diversification, Ricardian rents, and Tobin's q'. *The Rand Journal of Economics*, **19**, 1988, pp. 623–632.

Williamson, O. E. 'Hierarchical control and optimum firm size', *Journal of Political Economy*, **75**, 1967, pp. 123–138.

Williamson, O. E. *Markets and Hierarchies: Analysis and Antitrust Implications*, The Free Press, New York, 1975.

Williamson, O. E. *The Economic Institutions of Capitalism*, The Free Press, New York, 1985.

APPENDIX: INDEPENDENT VARIABLES

RETURN ON EQUITY	Net income divided by the average of beginning and end of year equity of subsidiary held by parent. Computed after applying parent's tax rate.
SIZE RELATIVE TO PARENT	Percentage formed by dividing equity of subsidiary by stockholder's equity of parent and multiplying by 100.
REGULATORY INTENSITY	The ratio of regulatory commission expenses (in thousands) to stockholder equity of parent (in millions). Regulatory commission expenses consist largely of labor-based costs incurred in producing and defending rate case requests, responding to inquiries by commissions during various reviews and audits. Only those costs directly attributable to the home state commission of the company, removing those for other states and federal agencies were used. A 3-year, moving average was used.
ORGANIZATIONAL FORM	Coded 1 for multidivisional structures, 0 otherwise.
RELATED BUSINESS	A subsidiary judged to be related according to the following definition, created by combining the views of Rumelt (1974), Nelson and Winter (1982) and adapting them to an electric utility: ...a business is related to the core utility function when common skills, resources, or a common purpose applies to each. Characteristics include similarities in the day-to-day operation of businesses, common technological and infrastructure inputs and procedures, applicability of human skill learned in one to the other, and similarities in end-markets and/or channels of distribution. These market/distribution similarities can include common sales forces and/or customers, and similar competitive conditions (e.g. ease or difficulty of entry, regulatory controls)... To code business descriptions, two senior managers were retained, one from an electric utility and another from a regulatory commission. The two experts agreed in 81.1% of the cases; the author categorized cases wherein there was a disagreement.
AVERAGE SIC RETURN	Net income after taxes divided by shareholder's equity.