Can Diversification Create Value?
Evidence from the Electric Utility Industry

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December 17, 2004

Abstract: Despite SEC and state-level resistance, and contrary to the trend pursued by other firms, many electric utilities have diversified into non-electric and unregulated businesses. Moreover, this failure to focus has been rewarded with higher firm values, again contrary to the discounts documented in the literature for other diversifying firms. Prior literature has questioned whether these premiums (or discounts) can be attributed to diversification *per se*. Rather, these premiums could arise from the characteristics of the diversifying firms, which have then endogenously chosen to diversify. In a new approach, where regulation can make the diversification decision largely exogenous, we examine the investment policies of the comparable electric-segments in the diversifying and non-diversifying utilities. We find that single-segment electric utilities over-invest compared to diversifying utilities, which explains their diversification premiums and implies that diversification can create value by opening up new investment opportunities.

JEL Classification: G31, G34, L94

Keywords: Diversification; Electric Utilities; Internal Capital Markets; Regulation

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1. Introduction

While the average diversification discount is popularly said to be fifteen percent, over one-third of diversified firms are apparently valued at a premium relative to comparable single-segment firms. Consequently, it is important to examine the conditions that can lead to such contrasting outcomes among firms. For this reason, we study the diversification practices of the electric utility industry, where corporate diversification policies were constrained by regulators during the eighties and part of the nineties. These constraints help form a natural experiment to assess the value effects of diversification. Essentially, we are able to assess the benefits to some firms of the opportunity to enter new businesses relative to other largely comparable firms that were denied that opportunity.

Although electric utilities generated substantial free cash flows for much of the last two decades, managers were reluctant to make politically unacceptable large dividend or other payouts to investors. While this reluctance of electric utility managers may have had a uniquely concrete basis, the likely adverse reaction of regulators, their unwillingness to distribute profits back to investors may actually be more common. Motivated by the usual agency problems, whereby they prefer larger firms and greater spans of control (Jensen and Meckling, 1976, Jensen, 1986, and Denis, Denis, and Sarin, 1997, and many others), managers in general tend to withhold free cash flows. While this implicit agency-based constraint limits the distribution of free cash flows by firms, diversification opens up new investment outlets for these funds, albeit sometimes into unfamiliar and unprofitable areas. Indeed, few electric utilities returned free cash flows to investors during the period. Instead, they looked for investment opportunities. Their two alternatives consisted of either continuing investment in the familiar electricity business (focused firm) or diversion of funds into other utility or non-utility businesses (diversified firm). The purpose of this paper is to examine whether the additional channels for investments through the

diversified activities offered better opportunities to create value than the pre-existing focused electric business. Importantly, the diversified and focused electric utilities in our sample are comparable because their diversification decision was to an extent exogenously dependent on getting reluctant regulators to permit diversification.

The widespread regulatory opposition to diversification has a long history and arose out of many factors that are unrelated to the value of the diversifying investments themselves. In particular, regulators were primarily concerned about exploitative transfers from ratepayers rather than the profitability of the new businesses.[1] Moreover, we should not expect regulators to make definitive profit assessments of unfamiliar diversified businesses. However, electric utility managers may be expected to propose only profitable diversifications (though their ability to do so may also be questionable), some of which are approved while others are denied permission. Therefore, utility regulation creates an ideal 'natural experiment' enabling us to measure the value differences among firms as a result of diversification *per se* by comparing values of single- and multiple-segment utilities. Even though regulators did not *force* utilities to become diversified, they effectively *prevented* many single-segment utilities from entering new businesses due to exogenous regulatory constraints.[2] Note that some single-segment electric utilities may have optimally chosen not to diversify, while the others are unable to because of regulatory constraints. Thus, the premiums we find on the diversifying firms relative to the truly constrained firms may arguably be even larger than those reported in this paper.

The recent interest in the value effects of diversification was initiated by Lang and Stulz (1994) and Berger and Ofek (1995), who report that the shares of the typical diversified firm sell

[1] The 1982 Ad Hoc Committee on Utility Diversification states that, "Regulators should review their authority relative to the following points: (a) Affiliated-interest relationships; (b) transactions between utility and any affiliates; (c) accounting procedures; (d) dividend payments; (e) transfer pricing; (f) common cost formulation; (g) holding company formation; (h) conditions on the establishment of a holding company; and (i) periodic review of the impact of diversification on the utility and its ratepayers" (p.80-3).

[2] It should be noted that after partial deregulation of the utility industry after 1992 (when the regulatory opposition to diversification arguably eased), the trend toward diversification further increased. The number of utilities with non-regulated segments increased from 21 to 34 between 1992 and 1997. This trend is consistent with the hypothesis that after 1992 firms were able to efficiently choose their organizational structures (focused vs. diversified) without being constrained by regulatory authorities.

at a discount relative to those of focused firms. This finding has held up in other samples, including those of non-U.S. firms (Servaes, 1996, and Lins and Servaes, 1999, and 2002). Indeed, according to Comment and Jarrell (1995), John and Ofek (1995), Berger and Ofek (1996), Daley, Mehrohtra, Shivkumar (1997), and Krishnaswami and Subramaniam (1999), increases in focus are rewarded with higher share prices. This should lead firms to specialize, which is just what they appear to have done in the eighties (Lichtenberg, 1992, Liebeskind and Opler, 1992, and Comment and Jarrell, 1995).[3] Yet, in the case of the electric utility industry over exactly the same period, we find that the trend is in the opposite direction. The percentage of electric utilities with non-electric segments rose from 43% in 1980 to 57% in 1997 of firms in the industry. In addition, while in 1980 only about 8% of the firms in the industry reported any unregulated (i.e., non-utility, outside of SIC code 49) business segments, by 1997 this proportion had grown to 34%. The actual extent of diversification is likely to be even greater since our data cover only segments with sales, assets, or profits that are at least 10% of the consolidated firm.

The growth of diversified businesses among electric utilities is even more remarkable since it has occurred despite concerted regulatory resistance. The Securities and Exchange Commission (SEC), empowered by the Public Utility Holding Company Act of 1935 (PUHCA), and state-level public utility commissions (PUCs), based on various explicit local statutes and other regulatory influence, have tried to restrict diversifying activities. Even when they have permitted it, regulators have tried to insulate the utility business from diversified activities, potentially reducing any synergies. The performance of these diversified businesses has not vindicated diversifying managers either, since the diversified businesses yielded poor industry-adjusted returns. However, investment in the electric business was apparently a worse option since we find that diversified electric utilities actually sell at a premium during the period of stricter regulation, 1980-1992 (based on Berger-Ofek (1995) excess value measures). Furthermore, we find that the excess value measures are *positively* related to the degree of

[3] However, Martin and Sayrak (2003) note recent claims that the observed trend towards focus may actually be the result of data biases and noisy proxies for diversification.

diversification (number of lines of business). Our evidence thus suggests that diversification was a better value proposition in the electric utility industry during this period.

Campa and Kedia (2002), Graham, Lemmon, and Wolf (2002), Villalonga (1999), Chevalier (1999), and Hyland (1999) question whether one can infer that diversification is value-destroying even if there is an observed diversification discount. Essentially, they argue that if underperforming firms undertake diversification, then the resulting diversified firm may sell at a discount compared to stand-alone competitor firms even if the act of diversification creates value. Indeed, these authors, and others (Lang and Stulz, 1994, Servaes, 1996), offer empirical evidence that the typical diversifying firm may already have been selling at a discount prior to diversifying.[4] Diversifying firms obviously have special characteristics that lead them to endogenously choose to diversify, and that these very characteristics apparently explain their lower values compared to competitor stand-alone firms (e.g., lower R & D, according to Hyland, 1999). Campa and Kedia (2002) and Villalonga (2004) employ statistical procedures to "undo" the selectivity bias, and find that the diversification discount disappears or even turns into a premium. However, others have raised questions about these techniques: Campa and Kedia (2002) apply industry level instrumental variables for industry-adjusted excess values, even though the variation in the instrument is essentially orthogonal to the variation in the dependent variable (Berger, 2003). Berger (2003) also points out that Villalonga (1999) uses propensity score matches to reduce selectivity bias, but she does so after already having controlled for important determinants (agency motives) of the propensity to diversify.

In spirit, our paper is akin to Campello's (2002) work on the functioning of internal capital markets in financial conglomerates in which he examines divisional responses to exogenous monetary policy shocks.[5] Diversification apparently creates value in our case because

[4] Measurement errors in the calculation of the diversification discount have also been suggested by Whited (2001) and Mansi and Reeb (2002) as the reason to doubt prior evidence on the effect of diversification.
[5] Our focus on exogenously determined regulation also follows Lamont and Polk (2002), who too consider exogenous shocks in order to study the value effects of diversification.

it allows more optimal distribution of investment into several divisions by a utility that would otherwise be constrained to over-invest in its core business.

Since our sample of diversified electric utilities sells at a premium, we undertake several empirical analyses to rule out the possibility of selection bias towards more profitable diversifications. First, we document that electric utilities experienced significantly poor returns in their diversified ventures, compared to other firms in those businesses or even compared to their own low risk electric business. Second, we find that both Return on Assets and Free Cash Flows normalized by Assets generated by electric utilities two and one year before they become diversified for the first time are *not* significantly different from returns and cash flows achieved by utilities that ultimately remain focused. Third, a probit analysis suggests that, after controlling for other factors, it was in fact underperforming utilities (lower EBIT/sales) that were more likely to diversify. In addition, we consider whether regulation *per se* may be the driver of value gains allowed to diversify by regulators. An examination of allowed rates of return does not support this hypothesis.[6] Diversified electric utilities actually obtain significantly lower allowed rates of return compared to single-segment electric utilities. Our results, however, are consistent with the opposite hypothesis that regulatory hurdles put in place by regulators reduce benefits from diversification. Taking into account this adverse regulatory effect, we find that diversification added nearly eight percent to the value of an electric utility during 1980s.

We also examine the investment allocations across divisions within the internal markets of diversified firms, so as to understand the cause of value losses or gains. The prominent recent explanation of diversification discounts is that diversification is value destroying because internal capital markets allocate capital sub-optimally across divisions (Rajan, Servaes, and Zingales,

[6] Allowed rates of return are determined by the Public Utility Commission in each state of the utility firm's operations. These rates effectively cap the profits each utility firm is able to generate. These returns could increase if the diversified utilities are able to increase the risk of their electricity operations through the "cross-subsidization" of the diversified business by the regulated component, with the bill ultimately paid for by consumers.

2000, Scharfstein and Stein, 2000, Scharfstein, 1998, and Shin and Stulz, 1998).[7] In contrast, we find that the single electricity segments of the undiversified utilities over-invest compared to the corresponding electricity segments of diversified utilities. Diversified utilities may be able to spread their investment over more industrial divisions (and our results suggest utilities optimally direct investment into segments with better growth opportunities), but single-segment utilities have to devote all their investment proceeds to their utility business. Ultimately, this excessive (inefficient) investment into electric-related business may be the source of value losses in focused utilities, making diversified utilities relatively more efficient. Thus, our findings suggest that diversification creates value by preventing over-investment in the electricity business, consistent with Alchian (1969), Weston (1970), Williamson (1975), Gertner, Scharfstein, and Stein (1994), Fluck and Lynch (1996), and Stein (1997) who stress the benefits of internal capital markets.

In some ways, the findings in this paper go beyond the unique setting of the electric utility industry. Our findings suggest that it is important to consider the conditions under which a firm makes the diversification decision. Given the general tendency of managers to withhold free cash flows (Jensen and Meckling, 1976, Jensen, 1986, and Denis, Denis, and Sarin, 1997), other non-utility firms also face the same choice between investments in their core business versus expansion into diversified activities. The relative merits of these options, in terms of the opportunities and the corresponding returns on alternative investments, lie at the heart of whether diversification adds or destroys value. Our natural experiment itself does not carry over, however. Absent regulation, when facing diversification decisions, other firms presumably freely choose the more valuable option.

The remaining paper is organized as follows: In the next section, we discuss the salient features of utility regulation with respect to diversification. Our data are described in section 3. In section 4, we document diversification premiums for the utility industry. We compare investments in the electric segments for diversifying and non-diversifying utilities in section 5. In

[7] Earlier explanations consistent with a diversification discount include a risk reduction motive (Amihud and Lev, 1981), empire-building (Jensen, 1986), and managerial entrenchment (Shliefer and Vishny, 1989).

section 6, we undertake several analyses to rule out the possibility that regulators systematically selected the more profitable electric utilities to grant permission for diversification. Finally, we offer concluding remarks in section 7.

2. Regulatory background and diversification practices

2.1. Federal regulation

Federal regulatory constraints on diversification by electric utilities date back to the Public Utility Holding Company Act of 1935 (PUHCA), which was passed in part to address the abuses arising from self-dealing between utility and non-utility subsidiaries of holding companies across different states and jurisdictions. Regarding non-utility businesses, PUHCA gave the SEC power to limited utilities "to such other businesses as are reasonably incidental, or economically necessary or appropriate," to the operations of the utility. To avoid PUHCA, most utilities have successfully formed so-called *exempt holding companies*. Such an exemption is commonly granted to a holding company whose utility and non-utility subsidiaries all operate within a single state and thus fall within the jurisdiction and scrutiny of a single state PUC. Until recently, there were less than ten electric utilities left as registered holding companies under PUHCA, making the regulation of diversification a predominantly state-level decision.

2.2. State-level regulation

At the state level, Public Utility Commissions (PUCs) have also exhibited skepticism about diversification by electric utilities. The concern is that, instead of gaining from any synergies (or local economic development), utility ratepayers will pay for extra costs and risks. However, at the state-level there is no universal PUHCA-like law that defines the scope and type of permissible diversification activities. In fact, as the diversification phenomenon grew in the early eighties, many PUC's responded quickly by acquiring statutory authority to approve diversification by utilities in their jurisdiction (See Appendix B). Since then, following the model legislation passed in California and Wisconsin in the mid-eighties, states have been developing detailed procedures to oversee any allowed diversification. Even without an explicit law,

however, most PUCs have had effective control over the diversification decisions of electric utilities in their jurisdictions. To protect the welfare of ratepayers, regulators have erected "Chinese walls" between the utility and non-utility businesses, using both organizational structures and administrative procedures. Commonly, they have adopted procedures that attempt to safeguard ratepayers' in three areas: (1) Organizational structure: The organizational structure should ensure that the non-utility business is distinctly segregated from utility activities. This has usually led to the formation of separate corporate subsidiaries, although they are almost always wholly-owned. (2) Dealings: Services, materials, and contracts between the utility and non-utility subsidiaries should be subject to PUC supervision, ensuring for example that transfer prices are competitive. There should be no use of operating management or credit belonging to the utility business for the benefit of the non-utility business. (3) The non-utility business should constitute only a relatively small fraction of the firm as a whole.

2.3. Diversification practices

The first significant moves into diversified businesses by electric utilities began in the early eighties. This situation is well described by Debbie Galant in the *Institutional Investor* (Feb. 1988, p. 167):

"After watching the dream of cheap nuclear energy turn into a nightmare of protest and cost overruns, electric utilities are finally emerging from two decades of Sisyphean construction projects. And they're breathing the sweet air of opportunity. With cash burning in their pockets and projected growth in electricity demand practically flat, a whole generation of utility management suddenly finds itself for the first time unburdened of construction needs. They could buy back their stock and put the money back in their shareholders' pockets, or they could lower their customers' rates – and some utilities are doing both. But the prevailing strategy in the industry these days is to take the money and invest it in unregulated businesses where there is no cap on return on equity. As investor relations people are fond of saying, they want to grow their companies."

In only a few cases, the "free" cash was returned to investors by either raising dividends, stock repurchases, or paying down debt. However, most electric utilities began to transform themselves, as they prepared to invest in new lines of business. They began to change their

names in an attempt to signal Wall Street that they were no longer just no-growth utility enterprises. Indeed, some utilities entered businesses that were far removed from the electricity business. Potomac Electric Power leased Boeing 747s to KLM and Singapore Airlines. FPL Group acquired Colonial Penn Group, an insurance company. Pacific Lighting Corp bought a chain of drug stores. These diversification activities obviously stirred up controversy. In reaction to Pacific Gas and Electric's bid to acquire G. D. Searle's pharmaceutical subsidiary that makes Nutrasweet, regulators asked, "What do electricity-makers know about coffee and cola sweeteners?" (*The San Diego Union – Tribune*, July 28, 1985, p I-1).

In some cases, ratepayers found the financial viability of the utility business threatened by the losses racked up by the non-utility businesses. But, apart from a few famous large failures, the overall opinion as voiced by the industry expert, Douglas Hawes (*PR Newswire*, July 24, 1989), was that, "While there have been varying degrees of success in the area of diversification by exempt utility holding companies, there are no instances in which diversification has seriously threatened the financial soundness of utility companies. Such companies are protected both by the holding company structure and by the regulatory power of the state commissions over the utilities."

2.4. Post-1992 partial deregulation

The year 1992 marks an important year in the history of electric utility regulation. Since the passage of the Public Utility Regulatory Policies Act of 1978 (PURPA), the next sweeping reform of PUHCA can be ascribed to the passage of The Energy Policy Act of 1992 (EPACT). Congress passed EPACT in order to deregulate the industry. Under EPACT, utilities faced substantially increased competition in the electric generating sector, since now new unregulated entities could be formed to generate and sell electricity at wholesale prices. While this was a move that opened up options within the electric business itself, it was accompanied by a number of other deregulatory moves in the environment, suggesting a meaningful change in the mindset

regarding electric utility diversification. Importantly, since an unregulated subsidiary could be involved now in the generation side, questions of separating the regulated and unregulated components of the business began to be address more broadly. In addition, the gas industry had already seen several years of experience with "deregulation" on the transmission side as well (FERC Orders 436 and 500). Moreover, with the growth opportunities seen in the nineties, many more utilities began to branch outside their traditional domain, and regulators became more accepting.

We argue that the environment supportive of the existence of diversification premiums exists only during the period of strict exogenous regulation (1980-1992). After this period, we hypothesize that the electric utility industry, without the stronger constraints on diversification, permitted utilities to more freely undertake diversification when it was the value-creating choice. Thus, overinvestment into the electric utility business should diminish, and the consequent diversification premiums should disappear.

3. Sample selection and data

For our study, we chose the years 1980 to 1997. Prior to 1980, unrelated non-utility diversification by electric utilities was a minor phenomenon, and might be referred to as "accidental" diversification ventures (Enholm, Jaditz, and Malko, 1982). The last year in our study is 1997 because after this year the segment reporting practices have changed considerably due to Rule SFAC No. 131 (Ettredge, Kwon, and Smith, 2002).

We examine the diversification policies of all investor-owned electric utilities covered by the Compustat Industry Segment database in each year of our study. This database contains segment-level information on five variables [net sales, earnings before interest and taxes (EBIT), depreciation, capital expenditures, and assets], based on audited footnote information for segments whose sales, assets, or profits exceed 10% of consolidated totals. This 10% cutoff possibly implies that we ignore some instances of diversification, which because of regulatory

resistance will frequently not amount to 10% of the sales, assets, or profits of the firm. Segment level disclosures are required by FASB No. 14 and by SEC Regulation S-K for fiscal years ending after December 15, 1977. Survival bias is not a major concern since there were virtually no bankruptcies for our sample. There were no more than a handful of acquisitions and takeovers.

Table 1 provides the yearly size of our sample and various measures of the diversified businesses undertaken by the electric utility industry. We consider two alternative definitions of diversification in this table and later in our analysis (electric vs. non-electric, and regulated vs. unregulated businesses):

1. Single electric-segment firms [non-diversified] vs. Electric utilities with non-electric segments [diversified]. That is, we consider utilities with only an electric segment (SIC code 4911) as non-diversified, whereas multi-segment firms containing an electric segment and at least one non-electric segment (in any other 4-digit SIC code) are defined as diversified. This definition takes a narrow view of focus, since even related businesses fall within the category of diversified activities. Thus, any non-electric business, whether related or unrelated, constitutes diversification.

2. Single regulated-segment firms [non-diversified] vs. Electric utilities with non-regulated segments (outside of SIC codes 4900-4999) [diversified]. That is, we lump together all segments in SIC codes 4900-4999 and treat them as a single regulated segment, which correctly captures the regulated nature of most of these businesses. Thus, this classification distinguishes between activities in the relatively secure regulated environment and those in the competitive arena. It also has the advantage that it steps over the complex issues of relatedness and provides a convenient, though admittedly noisy, method of combining related businesses with the core electric business. Consequently, in a manner akin to Berger and Ofek (1995), segments with 2-digit SIC codes other than 49 are considered unrelated businesses as well (besides being unregulated).[8]

Table 1 documents a clear trend towards diversification. An additional 14% of the electric utilities change from single-segment to multi-segment status over the period 1980 to 1997. The median number of segments for a firm in the electric utility industry increases from 2 to 3 over the same period. The median for the fraction of diversified assets to total assets grows from 10.6% to 20.9%. Finally, based on both means and medians for the Asset Herfindahl, there is again evidence of growing diversification in the industry. In contrast, for a largely overlapping

[8] As a result, this definition combines two major related and regulated energy businesses, electric and gas, within one segment. However, some other areas of possible vertical integration, such as fuel-related pipelines (2 digit SIC code 46), are included in the unrelated businesses.

period and a sample of firms drawn from a broad cross-section of industries, Lang and Stulz (1994) find that the number of highly diversified firms as a fraction of the number of specialized firms falls "dramatically" from more than one-half to less than one-sixth" (p. 1263). Similarly, Comment and Jarrell (1995) report that the proportion of firms with only one segment increased by about one-half from 38% to 58% for an unrestricted sample of firms from 1980s.

In the remaining columns, (7) through (10), we compare single regulated-segment utilities with electric utilities that have unregulated (and unrelated) segments. One unambiguous indication of growing unrelated diversification is that the number of utilities with such businesses has increased from 8.3% in 1980 to 34.3% in 1997 of the firms in the industry. Two points are worth noting about these statistics. First, because of the 10% cutoff criterion used for reporting segment level data, these statistics understate the extent of participation in diversified activities. Second, even when the 10% cutoff is exceeded, we expect that regulators will constrain the allowable extent of diversification. Indeed, while participation rates have grown, the average amounts of diversification undertaken by firms in the industry do not offer a clear trend over the years.

In Table 2, we present the analysis of the distribution of sample segments. The data suggest that utilities tend to diversify into a vast range of industries. Based on 3-digit SIC classification, we find that there are a total of 43 different non-regulated, and 5 non-electric regulated industries to which sample electrical utility companies diversified between 1980 and 1997. The most common non-regulated industry segments in our sample are oil and gas extraction, telecommunications, and mining. Among non-electric regulated industries, gas production and distribution is the most frequent direction of diversification. The overall diversification patterns are similar for the period of strict utility regulation (1980-92) as well as for the period of regulatory weakening (1993-97).

In Table 3, we provide several descriptive statistics, notably the following:

Size: Using our first definition of diversification (non-electric), single electric-segment firms appear to be slightly larger compared to diversified firms during the period of strict regulation, 1980-92. This is surprising since the majority of diversified firms in other industries (conglomerates) tend to be larger. However, if capital is not diverted into diversified activities, utilities have incentives to over-invest and obtain assured allowed rates of return on larger rate bases. Interestingly, the sizes of diversified utilities during 1993-97 slightly exceed the sizes of focused firms. Still, the differences are not consistently significant for both means and medians during either of the periods. Similarly, turning to non-regulated diversifications, the overall evidence again suggests that the diversified and non-diversified firms have similar sizes.

Profitability: Both diversified and non-diversified utilities have similar profitability (measured by EBIT/Total Assets) during both periods, 1980-92 and 1993-97. However, diversified utilities were able to generate more free cash flows[9] during the period of strict regulation, 1980-92. Interestingly, this potential advantage disappears during 1993-97.

Capital Expenditures: Suggesting that single electric-segment firms invest more than diversified firms, we find in Table 3 that the difference in both the mean (7.6% vs. 7.2%) and median (7.1% vs. 6.6%) ratios for capital expenditures-to-total assets is significantly higher for single electric-segment firms during 1980-92. This result, together with the slightly worse profitability, suggests that focused electric utilities might have been over-investing during 1980-92. However, the investment patterns completely change during 1993-97 – now diversified utilities invested significantly more.

Growth opportunities: We make two general observations regarding our growth opportunities measure – Tobin's Q. First, Tobin's Q's of both diversified and non-diversified utilities tend to be relatively small compared to companies in the other industries.[10] Second, even though statistically

[9] Free cash flows are measured using Lehn and Poulsen's (1989) formula:
FCF/Asset = [Operating Income. Before Depreciation – (Income Taxes – Change in Deferred Taxes) – Interest Expenses – Preferred Dividends – Common Dividends] / Assets.

[10] Tobin's Q is defined as [market value of equity + book value of liabilities]/[total assets] "Typical" average values of Tobin's Q's tend to be greater than 1.5.

significant, the magnitude of differences between Tobin's Q's for diversified and focused utilities are relatively small. These findings are understandable. Most of the business activities of any utility company are derived from the low-risk, low growth opportunities in the regulated electricity segment. In addition, the bulk of the additional segments of the firms in the diversified group belong to other safe regulated businesses (like gas), and seek "fair" returns from the same regulators that decide their electric rate requests. Interestingly, based on the second definition of diversification (non-regulated), we find what Tobin's Q's of diversified companies are generally larger, since such companies contain greater shares of riskier, non-regulated businesses with greater growth opportunities.[11]

4. The effect of diversification on firm value in the electric utility industry

Following Berger and Ofek (1995), we examine the effect of diversification on firm value by estimating the difference between a firm's total value and the sum of imputed values for its segments as stand-alone firms. In order to calculate the imputed value of a segment, we multiply its assets or sales by the median value-to-assets or value-to-sales ratio for single-segment firms in the same industry.[12] For the median ratio, we require at least five single-segment firms in the same 4-digit SIC code industry as the segment whose value we are imputing. If there are less than

[11] Since Tobin's Q is influenced by both company's growth opportunities and performance, Table 3 also contains the analysis of "Weighted industry average Tobin's Q" – a statistic where the impact of individual company's performance is suppressed. We define this variable as:

$$Weighted\ Industry\ Average\ Q = \sum_{i=1}^{N} w_i \underline{q_i}$$

where N denotes the total number of segments, $\underline{q}_i$ is the segment's $\underline{q}$ (defined as the median Tobin's Q of all the one-segment companies with the same 2-digit SIC code as the studied segment), and w_i is the segment's weight based on segment sales.

The results of the analysis of weighted industry average Q's are similar to the findings regarding the Tobin's Qs, suggesting the Tobin Q differences between diversified and focused utilities are due to different growth opportunities, not just different performance.

[12] Excess value is defined as (see Berger and Ofek, 1995): *log (Actual firm value / Imputed firm value)*, where 'Actual firm value' is the sum of firm's market value of equity and book value of debt, and 'Imputed firm value' measures the approximate worth of all company's business segments had they stayed as stand-alone entities. The imputed value of a company is obtained by summing imputed values of all of its segments. In order to compute imputed value of a business segment, we multiply its sales (assets) by the median 'value'-to-sales (assets) ratio for single-segment firms in the same industry. 'Value' is estimated as the market value of equity and book value of debt.

five firms at this level, we take the median from the 3-digit industry. In a final attempt, if the 3-digit industry does not have enough stand-alone firms, we use the 2-digit industry.[13] In forming imputed values, we adopt this procedure for both our definitions of diversification. That is, we invoke our two definitions only to measure diversification in alternative ways, but stick to the Berger-Ofek procedure in imputing values for the segments and adding them up to get value of the firm as a whole. Excess value from diversification (positive for gain and negative for loss) is then obtained by taking the natural log of the firm's actual value to its imputed value. To limit the impact of extreme outliers, all excess values are windsorized at 1% and 99% levels.[14]

Table 4 contains excess value measures for our sample firms using both the asset and sales multiples. Since we expect that diversification should provide different benefits during the period of strict regulation (1980-92) and partial deregulation (1993-97), we report our results separately for each of the two periods. In Panel A, single electric-segment firms are compared with diversified firms. In Panel B, single regulated-segment firms are compared with firms with unregulated (unrelated) segments. The overall findings are similar in both panels: diversified firms have significantly higher excess values than non-diversified firms during 1980-92, while the differences become statistically insignificant during 1993-97. However, several observations are in order. First, the figures for the means for the excess value measures for stand-alone firms are not always close to zero (e.g., for each panel, the non-diversified firms have mean excess values of –0.0729 and –0.0594 during 1980-92 based on sales multiples). This is not completely surprising, given that Berger and Ofek (1995) also find significant non-zero excess values for stand-alone firm.[15] Second, the median excess value measures in Table 4 are close to zero, just as

[13] Using this method, the imputed values of 90% of our segments is based on 4-digit SIC codes, an additional 3% get matched based on 3-digit SIC codes, while the analysis of the remaining segments is based on 2-digit SIC code matching.

[14] The values greater than 99th percentile of the distribution are assigned the numerical value of 99th percentile. Similarly, all values smaller than 1st percentile are assigned the value of the 1st percentile.(Berger and Ofek, 1995, make cuts on the data by dropping excess values lower than ¼ and greater than 4.)

[15] We have more reason to expect that outliers might affect our findings. Unlike, Berger-Ofek (1995), our analysis is based on a single industry, without the benefit of canceling out errors in value multiples across industries.

in Berger and Ofek (1995). Even so, during 1980-92 the median excess value measures, which range from about 0.6% to 1.8% for non-electric diversification in Panel A and 2.6% to 4.0% for non-regulated diversification in Panel B, are higher for diversified firms than non-diversified firms. In contrast to these premiums, Berger and Ofek (1995) report that 12.7% to 15.2% of firm value is *lost* due to diversification.

Table 5 contains regressions of excess value (log of firm value/Imputed firm value) on alternative measures of diversification, with size (log of assets), profitability (EBIT/sales), and capital expenditures (divided by sales) as control variables (these variables are the same as in Berger and Ofek, 1995):

$$Excess\ Value = a_0 + a_1\ Diversification\ Measure + a_2\ Size + a_3\ Profitability + a_4\ Growth + e \quad (1)$$

The coefficient of interest is a_1, which is predicted to be positive if diversification adds value. Following Berger and Ofek (1995), the coefficients on the remaining control variables are also predicted to be positive.

As before, we consider two alternative types of diversification, examining non-electric activities in Panel A and non-regulated activities in Panel B. We also consider the impact of diversification separately for periods 1980-92 and 1993-97. We measure diversification in two ways: (i) Diversification dummy, (0,1), with value one if it is a multi-segment utility, (ii) number of segments with different 4-digit SIC codes. If our results in Table 4 are to be supported, we expect that the diversification dummy and the number of segments will have a positive coefficient in our regressions for 1980-92. The coefficient for diversification measures during 1993-97 should be significantly smaller. Lastly, to limit the possibility that the regression results are driven by one particular year or one particular company (Campa and Kedia, 2002), our panel regressions in Table 5 are estimated using two-way fixed effect least squares analysis (by adding separate dummy variables for each of the years and each of the companies – the values of those dummy variables are not reported in Table 5).[16]

[16] However, the results of our analysis are virtually identical if estimated using OLS analysis.

The findings in Table 5 consistently support our earlier conclusion that diversification adds value in the electric utility industry during 1980-92. The diversification into non-electric (non-regulated) businesses adds 6.1% (4.5%) in value, based on the coefficient of the diversification dummy when we use the sales multiplier. The coefficients on the diversification dummy, when the asset multiplier is used, imply gains of 1.7% (Panel A) and 0.6% (Panel B). Adding a non-electric segment produces an increase in value of 2.2% (Panel A, using sales multiplier). Adding an unregulated segment, adds 2.9% (Panel B, using sales multiplier). We obtain a slightly smaller estimates for gains associated with diversification (1.8% and 1.6%, respectively), if we use the sales multiplier. Still, our results suggest that during 1980-92, utility diversifications created excess value (seven out of eight regressions have coefficients indicating significant diversification premiums). On the other hand, the coefficients for diversification variables during 1993-97 are insignificantly different from zero in all but one of our regressions. Even more importantly, in every one of our regression models, the diversification coefficient for years 1993-97 is significantly smaller compared to the coefficient for years 1980-92. These results suggest that benefits to diversification of utilities significantly diminished following partial deregulation of the industry after 1992.

In Table 5, we also control for size (log of assets), profitability (EBIT/Sales), and growth (Capex/Sales), following the procedure adopted by Berger and Ofek (1995). As expected, profitability and growth have typically highly significant positive coefficients, suggesting that more profitable and growth-oriented firms have higher values. The findings for size are mixed. To the extent that the size variable is significant in all the estimations, it is performing its role as a control variable. However, it is unclear why the findings differ when the excess value is calculated using a sales multiplier versus an asset multiplier. Although Berger and Ofek (1995) overwhelmingly report positive coefficients for the control variables, they too find a significant negative coefficient on log of sales in the estimation using the asset multiplier (their Table 3, panel B).

5. Internal capital markets and benefits to diversification of utilities

Internal capital markets are considered to beneficially affect firm value, because by overcoming the information asymmetries faced by external capital markets, they improve the efficiency of investment decisions (Gertner, Scharfstein, and Stein, 1994, Fluck and Lynch, 1996, and Stein, 1997). However, there is evidence that internal capital markets may fail to adequately perform this function (Rajan, Servaes, and Zingales, 2000, Shin and Stulz, 1998, Scharfstein and Stein, 2000, and Lamont, 1997). The internal capital markets of electric utilities have not been investigated before. To examine them, in the next sections we study the following two questions:

1. Does the efficiency of the investment allocations in the core electricity business differ between single-segment and diversified firms?
2. Do diversified electric utilities make efficient investment allocations in their diversified businesses?

5.1. Investment efficiency and profitability of the core electric business

Table 6 presents an analysis of segment-level net capital expenditures [(capital expenditures-depreciation)/sales]. First, in Panel A, we consider firms with non-electric diversification. Comparing only the electric segments of diversified and non-diversified firms, we find considerable evidence that diversified firms make smaller investment outlays than single electric-segment firms during 1980-92 period. The mean (median) difference in the ratio of net capital expenditures to sales is -4.33% (-3.48%), which is significant at the 1% level. Significant differences in net capital expenditures are, however, not enough to conclude whether these investments are efficient. For that, we need evidence on relative profitability. We find that single-segment firms earned significantly smaller returns on assets (mean (median) difference is -0.62% (-0.56%)).[17] Ultimately, both higher spending and lower returns suggest that single segment firms

[17] It should be noted that the differences in ROA of electric utility segments between diversified and non-diversified firms are not likely to be caused by the problem of segment asset under-allocation. Berger and Ofek (1995) document that the sum of segment assets for some firms is smaller than the value of total assets since those firms do not fully allocate assets into segments. To cope with this potential bias, we

overinvest in their electric businesses. Conversely, diversification is associated with an improved investment policy in the core electricity business. The results for diversifications into non-regulated businesses (Panel B) are nearly identical – non-diversified utilities invest significantly more while getting significantly lower returns in their regulated segments.

Since electric utilities during the period of strict regulation apparently could not freely distribute all their profits without being scrutinized by the regulators and/or ratepayers, they tended to re-invest significant portions of their profits. It thus appears that diversified utilities benefited from opportunities to spread their investment into more business units (unlike single segment utilities that had to (over)invest all their capital expenditures into their electric (or regulated) business). Incidentally, during the period of partial deregulation (1993-97), the pressure to re-invest the profits for utilities likely weakened, and the observed electric segment investment and performance patterns changed. Even though diversified companies' electric segments perform no better compared to the period 1980-92, the non-diversified companies no longer invest more than their diversified counterparts (in fact, in case of diversification into non-regulated businesses, the mean and median electric segment ROA for diversified and non-diversified utilities are statistically indistinguishable, while diversified utilities invest significantly more in their electric segment).

5.2. The efficiency of investment in diversified businesses

The right half of Panel A of Table 6 reports the analysis of net investment and returns generated on non-electric businesses of diversified firms. Since net investment needs likely differ across various industries, we measure the non-electric net investment as the industry-adjusted net capital spending (the difference between the segment's actual net spending and median spending of all the one-segment companies with the same 2-digit SIC codes). The segments' industry

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multiply the value of electrical segment assets by the ratio of total assets divided by the sum of segment assets. Since electrical utility companies are apparently least likely to under-report assets into its most important - electrical - segment, one can argue that the asset adjustment we implement in fact provides a very conservative (downward-biased) measurement of ROA for electric segments of diversified companies.

adjusted net spendings are then weighted by the relative sales-weight of each of the non-electric segments (with respect to the set of all the non-electric segments). Similarly, we weigh the non-electric raw and industry-adjusted (by median of the firms with the same 2-digit SIC code) ROAs by the relative importance (measured by sales weight) of each of the non-electric segments.

The results in Table 6 show that during 1980-92 period, the mean and median industry-adjusted capital expenditures on their non-electric business are significantly smaller than zero. At the same time, the non-electric segment-weighted return on assets, 7.86% is significantly smaller than the mean and median (9.72% and 9.62%) return on the electric segment. The non-electric segments also appear to underperform their respective industries, since the median non-electric industry-adjusted ROA is –0.44%, significantly smaller than zero.

Ultimately, these results suggest that when investing into non-electric segments during the period of strict regulation, diversified utilities invested at lower rates compared to the respective industry medians, but they are also generating comparatively lower returns. Still, this result does not necessarily mean that diversification leads to value destruction. Investing into segments with lower return may decrease a company's tax burden (in case the segment's return is negative). Even more importantly, it should also be noted that the relative performance of non-electric segments significantly improves over time. We find that the non-electric segment-weighted ROA improves significantly after the company first becomes diversified The mean (median) ROA in the first year of company's diversification is 4.9% (6.4%) while 2 years after that year the ROA rises to 6.8% (7.5%). These improvements are statistically significant at 5% level. [18] Incidentally, no such performance improvement trend is detected for electric segments.

Following partial deregulation of utilities, the efficiency of investment into non-electric businesses worsens. While the returns on assets are similar to those generated during the 1980-92 period, diversified companies now significantly over-invest in their non-electric businesses (the

[18] The industry-adjusted ROA changes stay positive, but lose statistical significance. Nevertheless, these findings still suggest that diversification into poorly performing segments does not imply further value destruction. Nor can one claim that utility managers are able to earn superior returns.

mean (median) industry-adjusted weighted net investment is 4.56% (2.23%), both values statistically significant at 1% levels).

Panel B of Table 6 shows that diversification into non-regulated segments has some different characteristics from the diversification into non-electric businesses. While we showed that diversified companies invest significantly less than the industry medians in their non-electric segments, our results in Panel B shows that utility companies actually invest significantly more than the industry medians in their non-regulated segments during 1980-92 period. At the same time, they also earn significantly greater returns compared to the industry medians. During the 1993-97 period, the diversified companies tend to lower their investment in non-regulated businesses in line with the respective industries, but they also tend to earn generally lower returns (the non-regulated mean industry-adjusted is in fact significantly negative).

Table 7 provides further evidence on efficiency of non-electric (non-regulated) investment by studying segment-level investment as the function of segment growth opportunities. Rajan, Servaes and Zingales (2000) and Shin and Stulz (1998) show that for a large proportion of diversified companies, diversification losses are a consequence of diverting too much of its investment into the segments with too limited growth opportunities. In contrast, the results in Panel A suggest that during the period of strict regulation, the diversified utilities pursued very efficient investment policies. While the investment into segments with high growth opportunities is not curtailed compared to the industry medians, the utilities tend to significantly limit their investment into non-electric businesses with below median growth opportunities. Following partial deregulation in 1992, the investment efficiency worsened. The companies significantly overinvest in their non-electric segments regardless the segments' growth opportunities. In fact, the investment rates for low-q segments are slightly higher compared to the investment into high-q segments.

The investment differences based on diversification into non-regulated businesses (Panel B) appear to be less clear-cut. While the investment rates into high-q segments are slightly higher,

the differences with respect to the investment into low-q segments are never statistically significant – both during 1980-92 and during 1993-97.

6. Regulatory Effects: Selectivity bias, cross-subsidization, and regulatory costs

6. 1. Selectivity bias among regulators

Since the choice of diversification is contingent upon regulatory approval, there is arguably a potential for selection bias in favor of diversification. Since diversification channels cash out of the core business, to avoid future financial distress, regulators may approve diversifications only after verifying that the utility is profitable and in sound financial condition. To examine this possibility, we compare returns on assets and FCF/TA for electric utilities two years and one year prior to when they first become diversified to these measures for a control sample of focused utilities. We do not find any statistically significant difference between the two sub-samples.[19] These findings suggest that prior performance is not an overriding factor in PUC's decision to grant the permission to diversify.[20]

Another plausible selection bias may be that regulators granted approval to superior managers. Possibly these managers were expected to excel in future diversifying businesses. Again, the evidence does not support this explanation for a diversification premium, since the diversifying businesses did not yield clearly superior returns. Moreover, even though the performance of diversified businesses improves during the two years following the diversification, the improvements were not statistically different from that of their industry.

Finally, we undertake a probit analysis to directly examine the effect of profitability on the diversification choice. As the analysis below shows, it was in fact the electric utilities with

[19] For example, two years prior to the eventual diversification, mean (median) return on assets for future diversified firms exceeds focused firms by only 0.08% (0.2%). Mean (median) differences in FCF/TA is -0.2% (0.03%). All differences are insignificant. Results for differences one year before diversification are similar.

[20] In addition, our results of probability of diversification in Table 8 show that for both non-electric and non-regulated diversification, the coefficients of EBIT/sales are significantly negative at the 1% level.

lower profitability (EBIT/Sales) that were more likely to diversify. Thus, it was not the more profitable utilities that systematically made it through the regulatory hurdle.

For the purpose of our probit analysis, we consider several factors that may affect an electric utility's decision to diversify. In addition, we include several other factors that have been used in prior work (Campa and Kedia, 2002). Except for the regulatory variable, other data for the factors are obtained from *Compustat*.

LOG OF TOTAL ASSETS: Larger electric utilities may have greater clout to overcome regulatory resistance to diversification. Moreover, they may have grown to the point that they may be looking for new avenues for growth.

EBIT/SALES: Poorly performing firms are expected to search for better opportunities elsewhere.
CAPITAL EXPEND./SALES: Firms with high current capital expenditures may be relatively too resource-constrained to invest in new businesses.

TOTAL DEBT/TOTAL ASSETS: Firms with higher leverage retain less free cash flow, and are thus less likely to diversify.

FREE CASH FLOW/SALES: Utilities with higher free cash flow are expected to diversify rather than possibly over-invest in the electric business. There are also agency-based reasons why managers may prefer not to reduce free cash flows by making larger payouts to investors. Notably, since dividends are subtracted in calculating free cash flows, dividends affect the diversification decision in just the opposite manner.

DIVIDEND YIELD: Utilities that made larger payments to their investors, do not need to diversify to use up their free cash flows.

TOBIN'S Q: Generally, firms with higher growth opportunities, as reflected in higher Tobin's Q values, are not expected to diversify since they can apply funds to their existing business. However, diversification and Tobin's Q may be positively related in the case of electric utilities. These firms have typically very low growth opportunities (see Table 3), leading them to search elsewhere. Diversification into any alternative business is likely to increase their Tobin's Q.

REGULATORY AUTHORITY: To capture the disposition of Public Utility Commissions (PUC'S) towards utility diversification, we collect state-level data on how utility diversification is handled. Although broadly empowered to control diversification activities of utilities in their jurisdictions, several states developed explicit procedures to process requests for diversification from utilities. Furthermore, they formally adopted regulatory authority to approve diversified activities (PUC's listed in Appendix A). We predict that the presence of these established procedures in their primary jurisdictions would increase the likelihood of firms successfully undertaking diversification. Ultimately, we expect explicit diversification regulation will have two important consequences. On the one hand, by enactment of the authority to approve diversification, these PUCs paved the path to receive, consider, and approve requests to undertake diversified

businesses.[21] However, on the other hand, in the process of making these considerations routine, they also developed regulations that erected stronger "Chinese Walls" between the utility and the diversified businesses, thereby adversely affecting any potential synergies across these businesses. Thus, while entry into diversified businesses may have become easier in jurisdictions with explicit authority, the benefits from diversification may have actually diminished. We examine the effect of regulation on these benefits in the next section.

Table 8 contains the findings for a probit analysis of the determinants of diversification. In every estimation, for both non-electric and non-regulated diversification in the early and later periods, the coefficient on the profitability variable (EBIT/Sales) is negative (at a 1% level of significance).

Instead of trying to second guess managers' assessments of diversifying businesses, regulators appeared more concerned about insulating consumers from the effects of diversification. In the following sections, we consider whether utilities were able to use their diversified businesses to benefit at the cost of consumers.

6. 2. Cross-subsidization

Utilities can benefit from diversification by transferring costs to the utility component of the firm. Table 9 compares the allowed rates of return on equity for the diversified and non-diversified electric utilities.[22] Allowed rates of return for sample firms were obtained from the *1994 Argus Utility Scope Regulatory Service Database* for the period for which we document a diversification premium,1980-92, when rate-making and regulation were most important. The evidence largely supports the conclusion that it was single-segment electric utilities, and not the diversified electric utilities, that earned higher allowed rates of return during the period 1980-1992. Jurisdictions that adopted procedures to allow utility diversification also put in place mechanisms to safeguard consumers from being adversely affected by the diversified businesses. In a unique, though out-of-print, survey of regulators undertaken by the National Regulatory Research Institute (reproduced in Appendix B), it can be seen that that the business relationships

[21] Alternatively, PUCs searching to maximize their political power are also likely to acquire authority to regulate diversifications in states where more utilities are expected to ask to approval for diversification. As a result, Regulatory Authority and probability of diversification may be positively related.

[22] Allowed rates of return are determined by Public Utility Commission in the state of each utility firm's incorporation. There rates effectively cap profits each utility firm is able to generate.

between electric utilities and their subsidiaries were commonly reviewed and taken into account specially during rate hearings to prevent cross-subsidies. We thus rule out the possibility that our diversification premium was because of cross-subsidization.[23]

6. 3. Costs of regulation

Finally, we consider the opposite possibility that regulation prevents the full benefit of diversification from being realized. Appendix A provides list of states with formal setup to review requests for permission to diversify. As pointed out earlier, these formal procedures, while enabling diversification, can also work to limit its benefits. Corroborated by the survey in Appendix B, we expect that PUC's with established mechanisms to deal with diversification will be more successful in separating the utility from its diversified businesses, which will adversely affect any synergies across them. The response from Illinois in the survey (Appendix B) is illustrative of how intrusively regulators intervened to ensure that the diversified businesses were kept apart. Yet, Illinois was in fact one of first states to develop a mechanism to grant permission to diversify (Appendix A).

> "IL -- The business relationships between electric utilities and their affiliates are reviewed during rate case proceedings. In addition, all management, construction, engineering, supply, financial or similar contracts and all contracts or arrangements for the purchase, sale, lease or exchange of any property or for the furnishing of any service, property or thing made with an affiliated interest must be filed and consented to by the Commission."
> (Burns, R. E., P. A. Nagler, K. Pfister, and J. S. Henderson, 1986, *Regulating electric utilities with subsidiaries*, The National Regulatory Research Institute, (January), Columbus, Ohio).

We test this possibility of an adverse regulatory effect, we examine how the diversification premium reported earlier is affected by regulation. The findings are presented in Table 10. Results are reported only when diversification is defined as going into non-electric

[23] We also explored a special case of cross-subsidization, a possible insidious transfer of capital costs from the diversified businesses to the regulated business. Regulators have an easier task in preventing cross-subsidization of observable costs such as those for materials, labor, etc. If, however, a utility undertakes additional risks through its diversified activities, regulators may feel compelled to allow higher returns on the regulated portion. The risk-spilling may be merely perceptual or it may be real if the regulated and diversified businesses are not distinctly kept apart. We test this possibility with regressions with PUC allowed rates of return (and industry-adjusted allowed rates of return) on the electric business as the dependent variable and the beta of the electric business and the beta of the diversified businesses. It is hypothesized that the allowed rates of return will be positively related to the betas of the diversified businesses if there is cross-subsidization through risk spilling. However, we do not find any significant evidence of such cross-subsidization.

businesses.[24] Using the sales multiplier, whether we consider the mere presence of diversification or its extent, the state authority to approve diversification significantly lowers the benefit of regulation during the strict period of regulation, 1980-1992. Without the adverse effect of regulation, the presence of diversification adds nearly 8% to the excess value of diversified firms.

7. Conclusion

Unlike other firms, electric utilities significantly increased their diversification levels over the period of our study, 1980-1997. We find that diversified utilities trade at significant diversification premiums during the period of strict utility regulation, 1980-92. Since their ability to freely distribute their profits was constrained due to potential adverse regulatory reaction, single segment utilities tended to inefficiently over-invest in their electric segments, unlike diversified utilities that had opportunities to spread their investment over various industries. Thus, diversification provided valuable alternative avenues for the excess cash generated by utilities. However, following partial deregulation of the industry during 1993-97, these diversification premiums disappeared. Moreover, the single-segment utilities also no longer appeared to over-invest in this period (when constraints on the distributions of utility profits weakened).

Frequently, researchers in finance drop electric utilities from their samples because of an implicit fear that the findings may be driven by regulatory considerations. However, besides being interesting on it own as an important industry, delving into the nature of this regulation reveals useful natural experiments that can yield broad implications for firms in other industries. In particular, conditional on being constrained from returning excess cash to investors, the net effect of internal capital markets can be value-adding. Even more broadly, our study also suggests that it is important to take into account a firm's specific circumstances, such as the prevailing conditions in its industry, to understand its diversification decision and the value effects of that decision. Finally, we offer a case where the raw diversification premium or

[24] We are left with only a handful of firms when we consider an alternative definition of diversification, regulated versus unregulated, *and* states with the authority to approve utility diversification.

discount can itself be interpreted in terms of the value effects of diversification, without engaging in corrections for endogeneity.

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Appendix A: State Level Authority to Approve Utility Diversification

Some states established procedures to receive, consider, and approve requests for undertaking diversification. An important component of this was the formal enactment of the authority to approve utility diversification. If a regulatory agency has statutory authority to regulate entry of a utility into non-utility activity, either directly or via affiliates, it is depicted by Y. Data are obtained from various issues of *Utility Regulatory Policy in the United States and Canada*, a publication of the National Association of Regulatory Commissioners. The publication was not brought out every year.

Agency of	80-81	84	89	90	91-92	92-93	93-94	94-95	95-96	Agency of	80-81	84	89	90	91-92	92-93	93-94	94-95	95-96
AL										MT									
AK		Y	Y	Y	Y	Y	Y	Y	Y	NC	Y	Y	Y	Y	Y	Y	Y	Y	Y
AR										ND									
AZ			Y	Y	Y	Y	Y	Y	Y	NE									
CA			Y	Y	Y	Y	Y	Y	Y	NH	Y	Y	Y	Y	Y	Y	Y	Y	Y
CO										NJ	Y	Y	Y	Y	Y	Y	Y	Y	Y
CT		Y	Y	Y	Y	Y	Y	Y	Y	NM		Y	Y	Y	Y	Y	Y	Y	Y
DC										NV									
DE										NY	Y	Y	Y	Y	Y	Y	Y	Y	Y
FL										OH									
GA			Y	Y	Y	Y	Y	Y	Y	OK									
HI	Y	Y	Y	Y	Y	Y	Y	Y	Y	OR	Y	Y	Y	Y	Y	Y	Y	Y	Y
IA										PA									
ID			Y	Y	Y					RI									
IL	Y	Y	Y	Y	Y	Y	Y	Y	Y	SC	Y	Y	Y	Y	Y	Y	Y	Y	Y
IN	Y	Y								SD									
KS										TN									
KY			Y	Y	Y	Y	Y	Y	Y	TX									
LA	Y	Y	Y	Y	Y	Y	Y	Y	Y	UT			Y	Y	Y	Y	Y	Y	Y
MA	Y	Y	Y	Y	Y	Y	Y	Y	Y	VA	Y	Y	Y	Y	Y	Y	Y	Y	Y
MD		Y	Y	Y	Y	Y	Y	Y	Y	VT									
ME		Y	Y	Y	Y	Y	Y	Y	Y	WA				Y	Y	Y	Y	Y	Y
MI										WI	Y	Y	Y	Y	Y	Y	Y	Y	Y
MN		Y	Y	Y	Y	Y	Y	Y	Y	WV									
MO										WY	Y	Y	Y	Y	Y	Y	Y	Y	Y
MS										Numbers	14	20	25	26	26	25	25	25	25

Appendix B

Regulatory Oversight of Relations between Utility and Subsidiary

The following are the responses from the 40 public utility commissions that participated in a survey conducted by The National Regulatory Research Institute. The responses suggest that the business relationships between electric utilities and their subsidiaries are commonly reviewed and taken into account in rate hearings. Reproduced from Burns, R. E., P. A. Nagler, K. Pfister, and J. S. Henderson, 1986, *Regulating electric utilities with subsidiaries*, The National Regulatory Research Institute, (January), Columbus, Ohio.

14. Does your commission review the business relationships between electric utilities and their subsidiaries or affiliates on a periodic basis? If so, please describe briefly.

AL -- Yes, the dollar flows and transactions between subsidiaries are reviewed on a periodic basis.

AZ -- No. However, review takes place at major rate hearings.

AR -- Only in the context of rate cases.

CA -- Yes. These relationships are reviewed in connection with general rate applications and if appropriate in other types of proceedings.

CO -- Yes. When the utilities are audited the effects of the subsidiaries or affiliates are also audited.

CT -- Yes. Services to utility must be at cost. Services from utility must be at market. Usually verified at rate cases.

DE -- No. Relatively small scale of operation does not warrant periodic review at present.

DC -- Not currently.

FL -- Three of the utilities under the regulatory jurisdiction of this commission are engaged in business transactions with their affiliates. The reviews conducted on these business relationships are limited primarily to contract compliance.

GA -- No.

ID -- Yes. During the course of each general rate case, the Commission reviews only affiliated transactions to determine if the services provided are at or below the costs of performing their service directly as part of utility operation.

IL -- The business relationships between electric utilities and their affiliates are reviewed during rate case proceedings. In addition, all management, construction, engineering, supply, financial or similar contracts and all contracts or arrangements for the purchase, sale, lease or exchange of any property or for the furnishing of any service, property or thing made with an affiliated interest must be filed and consented to by the Commission.

KS -- At the time of rate case filing, sales volumes, costs, and margins will be evaluated.

KY -- These are reviewed primarily in the context of rate cases.

ME -- Yes. During rate cases.

MA -- Usually if any review is made it is made in a rate case.

MI -- Yes. When doing compliance audits and / or rate case audits the goal is to keep the ratepayers whole.

MN -- No.

MO -- During a rate case proceeding to make sure there is no rate-payers' subsidy to the subsidiary.

MT -- (See note on question #1)
[Uncertain. This is untested in Montana at the present time and these questions on commission authority cannot be answered. A bill was recently introduced in the legislature, but died on the floor of the House. The bill would have clarified and established the authority of the Montana commission over the utilities subsidiaries. There has also been recent litigation between the commission and at least two utilities concerning subsidiaries and holding companies, no outcome of this litigation is yet at hand.]

NV -- Yes. Intra-company sales and common cost allocations are audited prior to general rate case proceedings. The commission's Five- and Twenty-Year Resource Plan hearings also consider the impact of subsidiary activities on the cost associated with the balancing and operation of the electric utility.

NH – Yes, in the context of rate proceedings and during audits by the Commission staff.

NJ -- No.

NY -- The relationship is usually examined during a rate proceeding or when utilities request authority to increase the investment in a subsidiary or form a new subsidiary.

NC -- Pursuant to N.C. General Statue (G.S. 62-51) the Commission has the authority to inspect the books and records of corporations affiliated with public utilities.
In an effort to keep abreast of the scope of the affiliated companies and their impact, if any, on the regulation utilities, the Commission requires the utilities to report annual the value and type of all services rendered by the affiliates to the regulated utility.

ND -- Yes—during rate cases and fuel adjustment clause audits. Under 49-02-02(6) the PSC is required to look at transactions between a utility and an affiliate for unreasonable profit. This is done in each rate case.

OH –Affiliate and / or subsidiary relationships are reviewed to the extent they have a material impact on the cost of service of the regulated electric utility. This is accomplished via rate case investigations, annual fuel procurement audits and Commission-initiated management audits.
The involvement of Ohio utilities in subsidiary/affiliate enterprises have, to date, fallen into one of three categories:

1. Activities too small to materially impact regulated services or costs;
2. Vertical integration type activities which can be treated as fully integrated for ratemaking purposes, obviating subsidy concerns; or

3. Convenience subsidiary arrangements, i.e., "paper," which create separate accounting or reporting entities generally for financing purposes. These, too, can be interpreted for ratemaking purposes.

OR -- Yes, in all rate cases.

PA -- Attached is Chapter 21 of Title 66 of the Public Utility Code. This chapter addresses the relations with affiliated interests. Affiliated interest filings are generally reviewed by the Electric Division and if found in the public interest are generally accepted. However, this acceptance is not binding for rate purposes. §2106 of the Public Utility Code addresses the effect on rates.
During rate proceedings, our attention is generally directed to the relationships between a service company and utility. For example, Allegheny Power System Service Company and West Penn Power Company; GPU Service Company and Met Ed and Penelec; CPU Nuclear and Met Ed and Penelec. Only if there is evidence that personnel and/or facilities are dedicated to other than utility service would we address this issue. These business relationships are also reviewed through Management Audits on a five to eight year cycle.

SC -- The Commission formerly did extensive review of Duke Power Company's relationship to its three affiliated coal mining operations. Duke has disposed of two of these affiliates, but still maintains one relationship. This relationship is always reviewed at the Commission's required semi-annual fuel hearing. The same review procedures were applicable for CP&L, however, CP&L is in the process of disposing of its affiliated coal mining operation.

SD -- No.

TX -- The Commission reviews affiliate transactions in connection with rate proceedings and / or fuel proceedings. The Commission's rules also require that an operational audit be performed for fuel affiliates.

UT -- The Commission would review the business relationships between a utility and its subsidiary.

WA -- Yes, if these relationships result in service or goods being used by the utility, the cost of which is part of the operating expenses or rate base used in setting rates for the Washington ratepayers.

WV -- When Appalachian Power Company owned coal producing subsidiaries, the West Virginia Commission repriced its production to the market if its prices were higher than market. APCO sold these subsidiaries in 1984.
We review service company charges in the context of an annual or semiannual fuel review case.
We review captive coal transactions in the context of an annual or semiannual fuel review case.

HI, LA, MS, NM, TN – No answer or not applicable.

Table 1
Level of Trends in Diversification in the Electric Utility Industry

In forming a single regulated segment firm, all segments with SCC codes 4900 to 4999 are combined into a single regulated segment. Data are obtained from *Compustat Segment* files. Herfindahl index is computed as a sum of squared proportions of divisional assets (sales) compared to total assets (sales). Means (in parentheses) are reported below medians.

		Single *electric*-segment firms versus firms with *non-electric* segments				**Single *regulated*-segment firms versus firms with *unregulated* segment**			
		(Every 4-digit SIC code industry considered as separate segment)				(All segments in SIC codes 4900-4999 grouped into one core regulated seg.)			
Year	**No. of Firms**	*No. of firms with multiple segments*	*No. of segments*	*Diversified Assets as a % of Total Assets*	*Asset Herfindahl*	*No. of firms with multiple segments*	*No. of segments*	*Diversified Assets as a % of Total Assets*	*Asset Herfindahl*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1980	97	42	2.00 (2.55)	10.62 (16.68)	0.8087 (0.7510)	8	2.00 (2.25)	12.96 (17.24)	0.7725 (0.7412)
1982	99	43	2.00 (2.56)	10.72 (17.10)	0.8075 (0.7543)	9	2.00 (2.44)	14.54 (22.01)	0.7437 (0.7159)
1984	101	45	2.00 (2.53)	12.09 (18.66)	0.7825 (0.7395)	12	2.00 (2.50)	16.54 (23.21)	0.7172 (0.7096)
1986	98	44	2.50 (2.61)	14.06 (20.61)	0.7564 (0.7137)	14	2.00 (2.50)	16.07 (20.92)	0.7269 (0.7232)
1988	100	51	2.00 (2.65)	16.72 (21.70)	0.7215 (0.6927)	19	2.00 (2.58)	16.32 (22.07)	0.7269 (0.7014)
1990	99	53	2.00 (2.64)	15.75 (21.05)	0.7288 (0.6930)	21	2.00 (2.43)	17.05 (20.86)	0.7171 (0.6994)
1992	97	52	3.00 (2.67)	17.76 (21.53)	0.7080 (0.6799)	21	2.00 (2.38)	15.59 (17.13)	0.7368 (0.7446)
1994	106	57	3.00 (2.88)	20.88 (23.28)	0.6722 (0.6688)	31	2.00 (2.51)	12.72 (18.30)	0.7855 (0.7743)
1996	104	54	3.00 (3.06)	21.31 (26.42)	0.6169 (0.6255)	30	2.00 (2.60)	16.13 (22.17)	0.7228 (0.7322)
1997	99	56	3.00 (3.32)	20.85 (26.92)	0.5792 (0.5934)	34	2.00 (2.56)	16.03 (19.26)	0.7405 (0.7516)

Table 2
Distribution of Sample Segments

SIC	Industry	Number of Segments			SIC	Industry	Number of Segments		
		1980-92	1993-97	**Total**			1980-92	1993-97	**Total**
109	Metal Mining	1	0	**1**	491	Electric Services	1282	514	**1796**
121	Coal Mining	7	0	**7**	492	Gas Production & Distr.	527	206	**733**
122	Coal Mining	40	18	**58**	494	Water Supply	70	21	**91**
131	Oil & Gas Extraction	48	28	**76**	495	Sanitary, Sewerage Services	0	5	**5**
153	Building Construction	5	0	**5**	496	Steam, Air-conditioning Supply	83	25	**108**
162	Heavy Construction	4	0	**4**	499	Other utility services	13	35	**48**
173	Electrical Construction	0	5	**5**	501	Motor Veh. Parts Wholesale	0	3	**3**
262	Paper Mills	0	1	**1**	504	Profess.&Comm. Eq. – Wholesale	0	2	**2**
267	Paper Boards, Boxes	0	1	**1**	506	Electrical Goods Wholesale	0	5	**5**
331	Steel Works	1	0	**1**	517	Petroleum Wholesale	7	36	**43**
344	Fabricated Metal	1	0	**1**	598	Fuel Dealers	3	5	**8**
352	Farm Machinery & Equipment	0	5	**5**	603	Saving Institution	6	5	**11**
356	Industrial Machinery	3	2	**5**	614	Personal Credit Institution	0	5	**5**
366	Communication Equipment	6	0	**6**	615	Business Credit Institution	4	7	**11**
384	Surg., Medical, Dental Equip.	0	3	**3**	616	Mortgage Banker & Broker	0	4	**4**
386	Photographic Equip.&Supply	0	5	**5**	631	Life Insurance	1	5	**6**
401	Railroad Transportation	5	0	**5**	633	Fire, Casualty Insurance	8	0	**8**
411	Passenger Transportation	2	5	**7**	651	Real Estate Operators	4	3	**7**
421	Trucking	5	0	**5**	653	Real Estate Agents	1	5	**6**
422	Warehousing	4	0	**4**	655	Land Developers	6	19	**25**
444	Water Transportation	14	10	**24**	679	Misc. Investing	27	22	**49**
449	Water Transportation	5	0	**5**	735	Equipment Rental, Leasing	1	0	**1**
481	Telephone Communications	45	12	**57**	739	Business Services	1	0	**1**
484	Cable and pay TV Services	4	2	**6**	871	Engineering, Architect Services	11	11	**22**
					874	Management & Pub. Rel. Svcs.	2	0	**2**
						Electric services	*1282*	*514*	***1796***
						Other regulated segments	*693*	*292*	***985***
						Non-regulated segments	*282*	*234*	***516***
						All Segments	*2257*	*1040*	***3297***

Table 3
Descriptive Statistics of Diversified and Non-diversified Electric Utilities

Data are obtained from *Compustat* files. Free Cash Flows are defined as (see Lehn and Poulsen, 1989): Operating Income – Interest Expense – (Taxes – Δdeferred Taxes) – Preferred Dividends – Common Dividends. Statistical significance of median (mean) differences are measured by rank-sum tests (T-tests).

Statistic	**Non-electric diversification** Single electric-segment firms versus firms with Non-electric segments				**Non-regulated diversification** Single regulated-segment firms versus firms with non-regulated segments			
	1980-92		**1993-97**		**1980-92**		**1993-97**	
	Single-Segment Median (Mean)	**Multi-Segment Median (Mean)**	**Single-Segment Median (Mean)**	**Multi-Segment Median (Mean)**	**Single-Segment Median (Mean)**	**Multi-Segment Median (Mean)**	**Single-Segment Median (Mean)**	**Multi-Segment Median (Mean)**
No. of firms	670	612	237	277	1090	192	362	152
Value = market value equity + book value debt, 1998 $MM	3415.33 (6177.80)	2752.50 (5128.69)***	4953.82 (8677.41)	5210.30 (7589.74)	2926.40 (5650.54)	3917.86** (5827.09)	5520.52 (8534.55)	4529.95 (7035.50)*
Total Assets, 1998 $MM	3262.61 (5965.67)	2564.70 (4826.66)***	4353.12 (7382.64)	3729.71 (6509.99)	2709.71 (5451.75)	3140.47 (5252.66)	4664.61 (7339.91)	3106.11* (5894.10)**
Sales, 1998 $MM	1029.44 (2029.99)	1061.68 (1972.86)	1273.17 (2480.76)	1448.91 (2469.17)	1034.09 (2003.85)	1243.83 (1996.28)	1687.88 (2551.86)	1404.04 (2290.32)
EBIT/Total Assets	0.0908 (0.0910)	0.0915 (0.0920)	0.0790 (0.0772)	0.0803 (0.0797)	0.0914 (0.0919)	0.0893 (0.0890)	0.0803 (0.0791)	0.0780 (0.0772)
Free Cash Flows Generated % Total Assets	4.05 (3.72)	4.84*** (4.70)***	4.27 (4.31)	4.57 (4.44)	4.35 (4.06)	5.30*** (4.95)***	4.44 (4.35)	4.45 (4.44)
Capital Expend., % Total Assets	7.12 (7.60)	6.64** (7.21)*	4.43 (5.26)	5.12*** (5.54)	6.87 (7.42)	6.75 (7.38)	4.54 (5.18)	5.67*** (5.97)***
Total Liabilities, % Total Assets	40.11 (40.68)	37.89*** (37.99)***	35.67 (36.45)	35.74 (35.52)	39.42 (39.79)	37.10*** (37.40)***	35.64 (36.12)	35.82 (35.54)
Income Taxes % Total Assets	0.0238 (0.0238)	0.0246 (0.0238)	0.0194 (0.0176)	0.0198 (0.0197)**	0.0240 (0.0243)	0.0218 (0.0231)	0.0201 (0.0187)	0.0188 (0.0186)
Tobin's Q	1.029 (1.050)	1.070*** (1.083)***	1.139 (1.161)	1.166*** (1.195)**	1.031 (1.049)	1.116*** (1.161)***	1.139 (1.159)	1.185*** (1.228)***
Weighted industry average Tobin's Q	1.106 (1.074)	1.119*** (1.097)***	1.207 (1.210)	1.223*** (1.240)***	1.106 (1.075)	1.132*** (1.143)***	1.207 (1.210)	1.246*** (1.263)***

***,**,* values for multi-segment and single-segment firms statistically different at 1%, 5%, 10%.

Table 4

Effect of diversification on firm value: Medians (means) of Berger-Ofek excess value measures for diversified and non-diversified electric utilities

Berger-Ofek excess values are defined as: log (Actual firm value / Imputed firm value), where 'Actual firm value' is the sum of firm's market value of equity and book value of debt. "Imputed firm value" is obtained by summing imputed values of all of its segments. In order to compute imputed value of a business segment, we multiply its sales (assets) by the median 'value'-to-sales (assets) ratio for single-segment firms in the same industry. Statistical significance of median (mean) differences is measured by rank-sum tests (T-tests).

Panel A: Mean (medians) for excess values for electric vs. non-electric segments

Period	Using Sales Multiples		Using Asset Multiples	
	Single electric segment firms Median (mean)	*Multi-segment firms Median (mean)*	*Single electric segment firms Median (mean)*	*Multi-segment firms Median (mean)*
1980-1992	**-0.0031 (-0.0729) N=670**	**0.0181**** **(-0.0067)***** **N=612**	**0.0003 (-0.0030) N=670**	**0.0058**** **(0.0102)***** **N=612**
1993-1997	0.0000 (-0.0328) N=237	-0.0495 (-0.0539) N=277	0.0000 (0.0059) N=237	-0.0034 (0.0077) N=277

Panel B: Mean (medians) for excess values for regulated vs. non-regulated segments

Period	Using Sales Multiples		Using Asset Multiples	
	Single regulated segment firms Median (mean)	*Multi-segment firms Median (mean)*	*Single regulated segment firms Median (mean)*	*Multi-segment firms Median (mean)*
1980-1992	**0.0001 (-0.0594) N=1090**	**0.0403***** **(0.0617)***** **N=192**	**-0.0007 (-0.0041) N=1090**	**0.0260***** **(0.0451)***** **N=192**
1993-1997	-0.0197 (-0.0538) N=362	-0.0379 (-0.0212) N=152	-0.0096 (0.0017) N=362	0.0126 (0.0191) N=152

***,**,* values for multi-segment and single-segment firms statistically different at 1%, 5%, 10%.

All value ratios are windsorized at 1% and 99% levels.

Table 5
Regression Analysis (2-Way Fixed Effects) of Excess Value on Measures of Diversification

Excess values are defined as log (Actual firm value / Imputed firm value), where 'Actual firm value' is the sum of firm's market value of equity and book value of debt, and "Imputed firm value" is obtained by summing imputed values of all of its segments. In order to compute imputed value of a business segment, we multiply its sales (assets) by the median 'value'-to-sales (assets) ratio for single-segment firms in the same industry. Heteroskedasticity-adjusted P-values are in parentheses.

Panel A: Diversification into non-electric segments

Dep.Var. Excess Value	Period	R^2, %	**(0, 1) Diversif. Dummy**	**No. of Seg.**	Log of Assets	EBIT / Sales	Capex / Sales
Using Sales Multiplier N=1796	1980-92	86.8	**0.0611 (0.0001)*****		0.2143 (0.0001)***	0.9768 (0.0001)***	0.5642 (0.0001)***
	1993-97		**-0.0010**$^{!!!}$ **(0.9565)**		0.2062 (0.0001)***	1.1814 (0.0001)***	0.2667 (0.0001)***
	1980-92	86.8		**0.0219 (0.0022)*****	0.2200 (0.0001)***	0.9608 (0.0001)***	0.5588 (0.0001)***
	1993-97			**-0.0103**$^{!!!}$ **(0.1170)**	0.2126 (0.0001)***	1.1431 (0.0001)***	0.2915 (0.0001)***
Using Asset Multiplier N=1796	1980-92	66.8	**0.0168 (0.0139)****		-0.1435 (0.0001)***	0.2009 (0.0001)***	0.1120 (0.0001)***
	1993-97		**0.0060**$^{!}$ **(0.4999)**		-0.1440 (0.0001)***	0.3939 (0.0001)***	0.0219 (0.4927)
	1980-92	67.3		**0.0177 (0.0001)*****	-0.1447 (0.0001)***	0.2158 (0.0001)***	0.1108 (0.0001)***
	1993-97			**0.0075**$^{!!!}$ **(0.0159)****	-0.1455 (0.0001)***	0.4197 (0.0001)***	0.0324 (0.3099)

Panel B: Diversification into non-regulated segments

Dep.Var. Excess Value	Period	R^2, %	**(0, 1) Diversif. Dummy**	**No. of Seg.**	Log of Assets	EBIT / Sales	Capex / Sales
Using Sales Multiplier N=1796	1980-92	86.7	**0.0445 (0.0033)*****		0.2221 (0.0001)***	0.9318 (0.0001)***	0.5455 (0.0001)***
	1993-97		**-0.0158**$^{!!!}$ **(0.3352)**		0.2136 (0.0001)***	1.1903 (0.0001)***	0.2827 (0.0001)***
	1980-92	86.7		**0.0286 (0.0044)*****	0.2190 (0.0001)***	0.9312 (0.0001)***	0.5449 (0.0001)***
	1993-97			**-0.0007**$^{!!!}$ **(0.9345)**	0.2099 (0.0001)***	1.2223 (0.0001)***	0.2782 (0.0001)***
Using Asset Multiplier N=1796	1980-92	66.8	**0.0062 (0.3893)**		-0.1405 (0.0001)***	0.1901 (0.0001)***	0.1100 (0.0001)***
	1993-97		**-0.0127**$^{!!}$ **(0.1042)**		-0.1408 (0.0001)***	0.3755 (0.0001)***	0.0282 (0.3809)
	1980-92	66.9		**0.0151 (0.0015)*****	-0.1426 (0.0001)***	0.1973 (0.0001)***	0.1050 (0.0001)***
	1993-97			**0.0025**$^{!!!}$ **(0.5585)**	-0.1430 (0.0001)***	0.4035 (0.0001)***	0.0319 (0.3221)

***,**,* coefficient significant at 1%, 5%, 10% levels.

!!!,!!,! coefficient for 1993-97 period different from the coefficient for 1980-1992 period at 1%,5%,10% levels.

Table 6
Segment-Level Performance and Investment by Diversified and Non-Diversified Firms

Data are obtained from *Compustat Segment* files. Statistical significance of median (mean) differences is measured by rank-sum tests (T-tests).

Panel A: Medians (means) for single electric-segment firms and multi segment firms with non-electric segments

	Electric Segments Only				Non-electric segments only (of diversified firms)			
	Net Capital Expend./Sales		Return on Assets		Industry-Adjusted Net Cap. Exp. Sales	Return on Assets	Industry-Adjusted ROA	Weighted segment non-electric q
Sample	***Single segment firms Median(mean) %***	***Multi segment firms Median(mean) %***	***Single segment firms Median(mean) %***	***Multi segment firms Median(mean) %***	***Seg-Weighted Median(mean)%***	***Seg-Weighted Median(mean) %***	***Seg-Weighted Median(mean)%***	***Seg-Weighted Median(mean) %***
1980-1992	**10.34 (15.56) N=670**	**6.86*** (11.23)*** N=612**	**9.06 (9.10) N=670**	**9.62*** (9.72)*** N=612**	**-3.83^{ooo} (-1.35)^{oo} N=612**	**7.86^{iii} (7.86)^{iii} N=612**	**-0.44^{ooo} (-0.35) N=612**	**1.121 (1.110) N=612**
1993-1997	**1.84 (3.74) N=237**	**1.98 (4.16) N=277**	**7.91 (7.72) N=237**	**8.62*** (8.50)*** N=277**	**2.23^{ooo} (4.56)^{ooo} N=277**	**6.35^{iii} (-4.44) N=277**	**-0.55^{oo} (-1.08) N=277**	**1.241 (1.294) N=277**

***,**,*: values for multi-segment and single-segment firms statistically different at 1%, 5%, 10%.
ooo,oo,o: values significantly different from zero at 1%, 5%, 10% levels.
iii,ii,i: values for multi-segment electric and multi-segment non-electric firms' segments statistically different at 1%, 5%, 10% levels.

Table 6 (Continued)

Panel B: Medians (means) for single regulated-segment firms and multi segment firms with unregulated segments

	Regulated Segments Only				Non-regulated segments only (of diversified firms)			
	Net Capital Expend./Sales		Return on Assets		Industry-Adjusted Net Cap. Exp. Sales	Return on Assets	Industry-Adjusted ROA	Weighted segment non-electric q
Sample	***Single segment firms Median(mean) %***	***Multi segment firms Median(mean) %***	***Single segment firms Median(mean) %***	***Multi segment firms Median(mean) %***	***Seg-Weighted Median(mean) %***	***Seg-Weighted Median(mean) %***	***Seg-Weighted Median(mean) %***	***Seg-Weighted Median(mean) %***
1980-1992	**7.99 (13.21) N=1090**	**7.02*** (9.28)*** N=192**	**9.04 (9.13) N=1090**	**9.50** (9.53)** N=192**	**4.62^{ooo} (12.32)^{ooo} N=192**	**5.67*** (1.87)** N=192**	**2.27 ^{ooo} (-2.02) N=192**	**1.206 (1.297) N=192**
1993-1997	**2.10 (3.43) N=362**	**4.00*** (5.94)* N=152**	**8.02 (4.46) N=362**	**8.25 (8.10) N=152**	**0.27 (1.04) N=152**	**3.93*** (-3.47)*** N=152**	**-1.00 (-8.22)^{oo} N=152**	**1.389 (1.454) N=152**

***,**,*: values for multi-segment and single-segment firms statistically different at 1%, 5%, 10%.
ooo,oo,o: values significantly different from zero at 1%, 5%, 10% levels.
iii,ii,i: values for multi-segment regulated and multi-segment non-regulated firms' segments statistically different at 1%, 5%, 10% levels.

Table 7
Segment-Level Investment and Non-Diversified Firms and Industry Growth Opportunities

Data are obtained from *Compustat Segment* files. Statistical significance of median (mean) differences is measured by rank-sum tests (T-tests).

Panel A: Diversified firms with non-electric segments

	Non-electric segments only (of diversified firms)			
	Weighted segment non-electric q	Industry-Adjusted Net Cap. Exp. Sales	Industry-Adjusted Net Cap. Exp. Sales – Below Median Weighted Industry q	Industry-Adjusted Net Cap. Exp. Sales – Above Median Weighted Industry q
Sample	***Seg-Weighted Median (mean) %***	***Seg-Weighted Median (mean) %***	***Seg-Weighted Median (mean) %***	***Seg-Weighted Median (mean) %***
1980-1992	**1.121 (1.110) N=612**	**-3.83^{ooo} (-1.35)^{oo}**	**-4.75^{ooo} (-2.83)^{ooo}**	**-0.94^{ooo} (2.78)^{ooo}**
1993-1997	**1.241 (1.294) N=277**	**2.23^{ooo} (4.56)^{ooo}**	**2.30^{ooo} (5.06)^{ooo}**	**1.92^{ooo} (3.85)^{ooo}**

Panel B: Diversified firms with non-regulated segments

	Non-regulated segments only (of diversified firms)			
	Weighted segment non-regulated q	Industry-Adjusted Net Cap. Exp. Sales	Industry-Adjusted Net Cap. Exp. Sales – Below Median Weighted Industry q	Industry-Adjusted Net Cap. Exp. Sales – Above Median Weighted Industry q
Sample	***Seg-Weighted Median (mean) %***	***Seg-Weighted Median (mean) %***	***Seg-Weighted Median (mean) %***	***Seg-Weighted Median (mean) %***
1980-1992	**1.206 (1.297) N=192**	**4.62^{ooo} (12.32)^{ooo}**	**4.58^{ooo} (10.31)^{ooo}**	**4.65^{oo} (14.64)^{ooo}**
1993-1997	**1.389 (1.454) N=152**	**0.27 (1.04)**	**0.11 (1.12)**	**0.31 (0.93)**

***,**,*: values for multi-segment and single-segment firms statistically different at 1%, 5%, 10%.
ooo,oo,o: values significantly different from zero at 1%, 5%, 10% levels.

Table 8
Probit Analysis of Determinants of Diversification

The dependent variable has value equal to one when the firm operates in multiple segments and zero otherwise. Non-electric diversification refers to utilities operating in other than electric generation segments, while non-regulated diversifications describe companies with segments outside regulated utilities industries (SIC=49xx). Free Cash Flows are defined as (see Lehn and Poulsen, 1989) Operating Income – Interest Expense – (Taxes – Δdeferred Taxes) – Preferred Dividends – Common Dividends. Dividend Yield equals to Dividends per share normalized by price. Tobin's Q is computed as (Market Value of Equity + Total Assets – Book Value of Equity)/(Total Assets). Regulatory Authority is a dummy variable equal to one if the firm is incorporated in a state where PUC has the authority to regulate diversifications, and zero otherwise (see Appendix A). T-statistics are in parentheses.

	Non-electric diversification				Non-regulated diversification			
	1980-92	1980-92	1993-97	1993-97	1980-92	1980-92	1993-97	1993-97
Intercept	1.423***	1.828***	-2.577***	-4.198***	-2.130***	-1.142**	-4.088***	-6.232***
	(3.32)	(3.84)	(3.64)	(4.59)	(4.04)	(2.02)	(5.30)	(5.71)
Log(Total Assets)	0.121***	0.119***	0.100**	0.117**	0.176***	0.166***	0.091*	0.118**
	(4.33)	(4.23)	(2.02)	(2.34)	(4.79)	(4.49)	(1.71)	(2.20)
EBIT/Sales	-5.467***	-4.461***	-2.549***	-3.675***	-3.673***	-2.367***	-4.605***	-5.769***
	(8.30)	(7.44)	(2.60)	(3.59)	(4.50)	(3.19)	(4.37)	(5.04)
Cap. Exp./ Sales	-0.395	-0.580*	-0.024	0.463	0.984**	0.924**	2.465***	3.190***
	(1.10)	(1.65)	(0.00)	(0.52)	(2.37)	(2.31)	(2.73)	(3.36)
Total Debt/ Total Assets	-3.802***	-4.267***	-1.490**	-1.099	-2.764***	-3.011***	-0.458	0.137
	(5.59)	(6.38)	(2.20)	(1.51)	(3.26)	(3.70)	(0.63)	(0.17)
Free Cash Flows/Sales	2.180***		-0.243		2.429***		0.811	
	(3.75)		(0.28)		(3.83)		(0.84)	
Dividend Yield		-1.958		10.544***		-6.739***		13.031***
		(1.46)		(2.89)		(4.06)		(2.92)
Tobin's Q	0.073	0.041	2.451***	3.173***	1.149***	0.846***	2.885***	3.841***
	(0.33)	(0.17)	(4.99)	(5.73)	(5.04)	(3.48)	(5.59)	(6.14)
Regulatory Authority	0.363***	0.361***	0.375***	0.422***	-0.037	-0.044	0.264**	0.306**
	(4.83)	(4.81)	(3.00)	(3.33)	(0.40)	(0.78)	(1.99)	(2.28)
N	1282	1282	514	514	1282	1282	514	514
Max. Likelihood	-788.7	-796.1	-305.1	-301.1	-486.8	-487.5	-267.2	-263.1

***,**,* Statistically significant at 1%, 5%, and 10%, respectively.

Table 9
Comparison of Allowed Rates of Return (AAR) of Single Segment Versus Multi-Segment Electric Utilities

Allowed rates of return for sample firms were obtained from the *1994 Argus Utility Scope Regulatory Service Database* for the period 1980-92. Statistical significance of median (mean) differences is measured by rank-sum tests (T-tests).

Sample	Non-electric diversification Single electric-segment firms versus firms with non-electric segments		Non-regulated diversification Single regulated-segment firms versus firms with non-regulated segments	
	Single-segment ***Median (mean)***	***Multi-segment*** ***Median (mean)***	***Single-segment*** ***Median (mean)***	***Multi-segment*** ***Median (mean)***
1980-92	**14.75** **(14.62)** **N=597**	**14.50***** **(14.30)***** **N=547**	**14.70** **(14.52)** **N=981**	**14.50***** **(14.18)***** **N=163**
1980-84	**15.00** **(14.95)** **N=237**	**14.51***** **(14.54)***** **N=192**	**14.78** **(14.82)** **N=447**	**14.50***** **(14.19)***** **N=48**
1985-88	**15.19** **(15.14)** **N=188**	**14.90***** **(14.78)***** **N=164**	**15.07** **(15.03)** **N=335**	**14.75***** **(14.61)***** **N=60**
1989-92	**13.00** **(13.59)** **N=172**	**13.02** **(13.66)** **N=191**	**13.00** **(13.55)** **N=308**	**13.25**** **(13.89)*** **N=84**

***,**,*: values for multi-segment and single-segment firms statistically different at 1%, 5%, 10%.

Table 10
Regression Analysis (2-Way Fixed Effects) of Excess Value on Measures of Diversification

Data are obtained from *Compustat* Segment files. Excess values are defined as log (Actual firm value / Imputed firm value), where 'Actual firm value' is the sum of firm's market value of equity and book value of debt, and "Imputed firm value" is obtained by summing imputed values of all of its segments. In order to compute imputed value of a business segment, we multiply its sales (assets) by the median 'value'-to-sales (assets) ratio for single-segment firms in the same industry. Regulatory Authority is a dummy variable equal to one if the firm is incorporated in a state where PUC has the authority to regulate diversifications, and zero otherwise (see Appendix A). Heteroskedasticity-adjusted p-values are in parentheses.

Diversification into non-electric segments

Dep.Var. Excess Value	Period	R^2, %	**(0, 1) Diversif. Dummy**	**(0, 1) Diversif. Dummy*Reg. Authority**	**No. of Seg.**	**No. of Seg.* Reg. Authority**	Log of Assets	EBIT / Sales	Capex / Sales
Using Sales Multiplier N=1761	1980-92	87.1	0.0804 (0.0001)***	-0.0399 (0.0324)**			0.2305 (0.0001)***	0.9686 (0.0001)***	0.5634 (0.0001)***
	1993-97		0.0180 (0.4196)	-0.0377 (0.0895)*			0.2235 (0.0001)***	1.1911 (0.0001)***	0.3013 (0.0023)***
	1980-92	87.1			0.0306 (0.0003)***	-0.0131 (0.0556)*	0.2355 (0.0001)***	0.9461 (0.0001)***	0.5570 (0.0001)***
	1993-97				-0.0016 (0.8325)	-0.0151 (0.0286)**	0.2301 (0.0001)***	1.1260 (0.0001)***	0.3492 (0.0005)***
Using Asset Multiplier N=1761	1980-92	65.2	0.0084 (0.3314)	0.0090 (0.3078)			-0.1381 (0.0001)***	0.1887 (0.0001)***	0.1122 (0.0001)***
	1993-97		0.0344 (0.0011)***	-0.0511 (0.0001)***			-0.1364 (0.0001)***	0.3684 (0.0001)***	-0.0318 (0.4953)***
	1980-92	65.6			0.0179 (0.0001)***	-0.0021 (0.5110)	-0.1373 (0.0001)***	0.1903 (0.0001)***	0.1127 (0.0001)***
	1993-97				0.0161 (0.0001)***	-0.0171 (0.0001)***	-0.1358 (0.0001)***	0.3754 (0.0001)***	-0.0037 (0.9375)

***,**,* coefficient significant at 1%, 5%, 10% levels.
!!!,!!,! coefficient for 1993-97 period different from the coefficient for 1980-1992 period at 1%,5%,10% levels