WHY FIRMS DIVERSIFY:

INTERNALIZATION VS. AGENCY BEHAVIOR

Randall Morck and Bernard Yeung

Abstract

We present empirical evidence that cross industry diversification, geographic diversification, and firm size add value in the presence of intangibles related to R&D or advertizing, but destroy value in their absence, presumably due to agency problems. This is consistent with synergy stemming from the internalization of markets for information-based assets. This supports Livermore (1935), who found a similar relationship between intangible assets, like R&D or advertising, and superior post-takeover firm performance in the U.S. "turn of the century" merger wave. We also find that the market for corporate control tends to make corrections in the appropriate direction. Firms that are large or diversified, but have few information-based assets are unusually likely to become hostile takeover targets. In contrast, small undiversified firms with such assets are unusually likely to become targets in friendly mergers.

Introduction

Many corporations are diversified while many others are not. An extensive literature has developed around the issue of whether diversification adds to firm value or reduces it. Case studies can yield both results. For example, in 1978 IT&T did business in 12 different industries (at the 3 digit SIC code level) and had an average Tobin's q of 0.570 which was substandard in all 12 industries. In the same year, 3M did business in 11 different industries, yet had a respectable q ratio of 2.02. Another well known example is GE, a very diversified company that is consistently well liked by investors. Did diversification hurt one firm and help the other, or did companies like 3M and GE build shareholder value despite its diversification?

Systematic empirical investigations suggest that a diversification discount is the norm,

especially in the US[1], e.g., Montgomery and Wernerfelt(1988), Lang and Stulz (1994); Berger and Ofek (1995, 1996), John and Ofek (1995), Servaes (1996), and Denis, Denis and Sarin (1997). Yet, others show a diversification premium, e.g., Rumelt (1982), Schipper and Thompson (1983) Matsusaka (1993) and Hubbard and Palia (1997).

There is an apparent time dependence in the value of diversification. The value of diversification fell from the positive range in the 1960s and early 1970s, through the neutral range in the late 1970s, and into the negative range in the 1980s.[2] Now, in the late 1990s, suggestions are again emerging about value increasing diversification. For example, C K Prahalad (1998) refers to the recent wave of focus increasing, size reducing restructuring as "corporate anorexia". Merger and acquisitions, both domestic and international, appear to be on the rise again.

Many argue for a diversification premium based on efficiency grounds. For example, Penrose (1959) argues for positive synergies from a resource-based perspective. Firms can benefit by expanding into related activities that share similar resources. Another argument (e.g., Scharfstein, 1997) is that large firms can pool financial resources and thus behave like internal banks for their business divisions. If internal financing involves less information asymmetry than external financing, firm diversification could be an efficient arrangement that commands a premium in firm value. In general, these arguments focus on the benefits of including more transactions within a corporate hierarchy.

---

[1] The literature is very voluminous. We shall therefore just lists some examples without trying to be all inclusive.

[2] Jensen (1989) argues that diversification became bad only in the 1980s. Schipper and Thompson (1983) show that in earlier period announcement returns for diversifying acquisitions are positive. Matsusaka (1993) and Hubbard and Palia (1997) find that bidder announcement returns for diversifying acquisitions are positive in the 1960s. Morck, Shleifer and Vishny (1990) find that stock returns to diversfying take overs are statistically indistinguishable from zero in the 1970s but become negative in the 1980s. Matsusaka (1993) suggests that his results are consistent with the hypothesis that in the earlier periods the market favored acquisitions intended to exploit managerial synergies. For thorough reviews, see Montgomery (1994) and Matsusaka (1997).

There are also strong arguments for that diversification reduces firm value. Bagwell and Zechner (1993) and Stein (1997) argue that highly diversified companies have more coordination problems and are subject to more influence costs. Morck et al. (1990) argue that diversification exacerbates the agency problems between shareholders and managers. Jensen (1986) argues for a negative return to diversification due to free cash flow agency problem. Baumol (1952) argues that value decreasing corporate growth in scale and scope is common. In general, these arguments focus on the costs of including more transactions within a corporate hierarchy..

The arguments of Coase (1937) are thus critical to both sides. A firm's boundary should be drawn where the benefits of including an additional set of transactions within its hierarchy just match the costs of including it. Not all firms have set their boundaries right: some are too far out and some are too far in. Also, the factors that determine this Coasian costs and benefits certainly change over time. When these forces change, the optimal firm boundaries change and value maximizing firms adjust their boundaries. During these transitions, we should observe many instances of value increasing diversification when "overly tight" boundaries expand or value increasing divestitures when "overtly loose" boundaries shrink.[3] This is because firm boundaries should adjust in the right directions in a healthy economy.

In this paper, we present evidence that diversification can add value for some firms and reduce value for others. We argue that the internalization theory of Caves (1971), Buckley and Casson (1976), Dunning (1977), Rugman (1980), and Helpman (1984) underlies positive corporate synergy. The synergy stems from the possession of information based assets with economies of

---

[3] From this perspective, we ought not believe that diversification always creates or destroys value. Sub-optimal firm boundary is a disequilibrium phenomenon that should not last. Some may argue that diversification reflects a firm life cycle: start-ups are more focused and more mature firms are more diversified. The former is more likely to have a firm value premium and the latter is more likely to suffer from agency discount. While plausible, the idea cannot explain why a collection of equally mature and large firms show both diversification discount and premium. To explain the observations, the firm life cycle idea has to be combined with a theory on the determination of firm boundary.

scale and scope. These firms ought to have more extensive firm boundaries. They can add value by being larger and more diversified because of these economies of scale and scope in their information based assets. We use this perspective to decompose the value effect of diversification into a component related to the possession of information based assets and a residual related to the net effect of having internal capital allocation and agency concerns. We find that diversification adds value in firms with substantial information-based assets, but destroys value otherwise. We then conduct a "follow up" study which reveals that the market for corporate control disciplines unwarranted diversification but encourages expansion to tap under-utilized information-based assets. This approach may explain the time dependence discussed above.

We believe this to be an important step forward. The corporate diversification problem is important because it addresses precisely why some firms should control more resources while others should control fewer. The efficient allocation of resources is a fundamental concern in economics. Our results suggest what sort of firms ought to control more resources - those with information-based assets. Moreover, it verifies that the economy is, on average, pushing firms to adjust in this direction. From a managerial perspective, our results suggest that a fundamental force for firm growth is the possession of information based capabilities.

In the next section, we present our theoretical thoughts. In Section III, we present our empirical methodology, followed by a "data" section. In Section V, we present and discuss our results and we conclude in Section VI.

II Theoretical Arguments

The literature identifies three forces that determine whether diversification increases or reduces firm value: the benefits due to business synergies and internal capital market versus the greater organization and agency costs in more diversified organizations.

Synergies

The literature is vague as to exactly what a synergy is. Generally, synergy seems to mean value that results from decreased fixed costs after a merger. Since fixed costs are likely to be duplicated by firms operating in similar industries, papers generally presume that synergies arise from related mergers, but not from mergers across unrelated industries.

The difficulty here is in defining "relatedness". Relatedness can take place between businesses that appear to be distinctly unlinked to outside observers. Transportation and electronics are clearly different industries, but electronics is a large and rising component of the cost of an automobile. Entertainment and computer network technology are similarly becoming intertwined, and some of the most exciting advances in power transmission involve using new ceramics as superconductors.

The practices in classifying relatedness can be quite problematic. The classification often relies on how close industry classification codes are, e.g., industries sharing identical 3 digit SIC codes are more related than industries that share only identical 2 digit SIC codes which are in turn more related than industries that share only identical 1 digit SIC codes, etc.. The proximity of the numerical value of industry classification codes is not always based on true business relatedness. The anecdotes in the previous paragraph clearly illustrate that business in distinctly different industry classification codes can be very related. Let us consider another example: the relatedness among male underwear, male work clothing, curtains and draperies, and cologne. Their industry classifications are, respectively, 2322, 2326, 2391, and 2844. Relying on industry classifications, one would think that male work clothing is more related to male underwear than cologne is. By the same token, one would expect that curtains and draperies are more related to male clothing than cologne is. Yet, higher end male underwear and cologne are very related whose value stems from company brandname image and marketing skills (e.g. the Calvin Klein products). Male work

clothing and curtains and draperies, however, are nowhere as related to male underwear.

Another practice is to define relatedness using historical correlation in business cash flow. The correlation allows researchers to conveniently pick up businesses that have complementary products and/or that use similar production inputs. The disadvantage of the approach is that it relies on historical data so that more recent business-relatedness is not easy to identify. Moreover, not all businesses well correlated in this manner ought to be controlled by the same company. For example, while architecture firms and construction companies have highly correlated earnings, they are often not integrated and construction companies outsource architectural services. More fundamentally, the approach begs the answer to a deeper question: why businesses with more correlated cashflows ought to be bundled in the same corporation.

The Internalization Theory of Synergy

We propose a different framework that directly addresses why some companies ought to have more divisions. Consider a company like 3 M which possesses a wealth of knowledge in adhesive material. It profitably branches into businesses that can tap into its technological know-how, like stationary (e.g., stick up notes and adhesive tapes) and cassette tapes (attaching electromagnetic particulars to plastic tapes). Honda has high capability in transferring power to wheels; it owns divisions in cars, motor cycles and lawnmowers. Accounting firms with a wealth of business intelligence branch into consulting. Companies which have products desired by an identical group of customers tend to merge together, e.g. Citibank and Travelers. Companies with brand capital own divisions that can benefit from the same name recognition, e.g., Calvin Klein and Sara Lee.

The commonality of these examples is that firms diversify into businesses, some appear to be unrelated, which use some common information based assets. This is the basis of the *internalization theory of synergy*, proposed by, e.g., Caves (1971), Buckley and Casson (1976),

6

Dunning (1977), Rugman (1980), Helpman (1984) and others.[4] According to the theory, information based assets are the key prerequisite for the existence of synergy. Examples of information based assets are production knowledge and skills, marketing capabilities and brandname, and superior management capabilities.

Information-based assets, once developed, can be applied repeatedly and simultaneously to multiple businesses and locations in a non-rivalry manner to generate extra returns. In this respect, intangible assets are quasi-public goods with large economies of scale and scope. The question is how to appropriate the value of these applications.

Armslength transactions of information based assets are often thwarted by numerous market failure problems. (Because these problems are well known, we shall be very brief here.) First, information is often difficult to transmit so that it is easier to give direction than to "explain and teach." (See, e.g., Demsetz, 1988, pp. 157-162)[5] Second, information asymmetry is an obstacle in the transaction of information based assets: the seller is interested in exaggerating the value of its assets while the buyer has little reasons to purchase based on blind trust. The "lemon" problem implies that a seller often cannot sell at a price commensurate with the actual quality of its asset. At the same time, after a buyer actually manages to learn the value of an information based asset, it has little incentive left to pay for the information-based asset because it already has obtained the information. Third, the value of an information based asset may rely on monopolistic possession. As more firms possess it, its value dissipates due to competing commercial activities all stemming

---

[4] See Caves (Ch. 1, 1985) for a more thorough and comprehensive overview of the economics presented here. The importance of the internalization theory of synergy has been empirically verified in the context of geographic diversification (Morck and Yeung; 1991, 1992). With some modifications, its logic should also apply to firms operating within a large country such as the United States.

[5] In the business strategy literature, many types of intangibles are part of "capabilities" embedded in a business organization that cannot be easily identified and are often non-extractible from an organization so that armslength transactions of these capabilities are impossible. See, e.g. Teece et al. (1997) and Kogut and Zander (1992).

from the same capability. A renter of information-based assets may behave opportunistically, including conducting unauthorized application of the rented assets. The renter then gains at the expense of the asset owner. Fourth, the successful application of information-based assets may rely on a user's effort. Ownership is then relied on to mitigate shirking. Also, the user may fail to maintain the assets and thus damages the asset, e.g., a brandname's reputation.

A solution, though not unique, to overcome the transaction difficulties is to *internalize* the markets for information-based assets by bringing the buyers and sellers together within the same firm. In other words, the solution is to incorporate the additional application of information based assets inside corporate boundary. The theory then suggests diversification benefits stem from the economies of scale and scope of intangible assets. This implies that sheer size and diversification can augment value when firms have substantial information-based assets. Moreover, firms possessing intangibles but are not diversified may under explore its potential firm value. (This is similar to the "core-competence-based" diversification in the management literature, e.g. Prahalad, 1998).

Internal Capital Market Argument and Agency Problems

The other explanations for diversification benefits and costs are "internal capital market" and "agency problems."

Business needs financing, e.g., to fund new investment, to bridge non-synchronised cash inflow and outflow, and to cushion temporary trough in income, etc. Outside financing can be costly because of information asymmetry between borrowers and lenders and internal financing is less expensive (e.g. Myers and Majluf, 1984). The creation of an internal capital market through corporate diversification may then be advantageous. Firms may be less constrained in seizing investment opportunities, less averse of individual business unit volatility, and thus less likely to

miss investment opportunities. Moreover, internal financing may mean more informed and closer monitoring and more readiness in divesting unprofitable investment (Gertner, Scharfstein and Stein, 1994). Of course, it has been argued that the convenient availability of financing and the lack of scrutiny by outside creditors can lead to agency abuse (Jensen, 1986), including over-investing and allocating internal capital on non-value terms.

While it is unclear whether the creation of internal capital market definitely leads to value augmentation, the argument nevertheless implies that scale and scope per se affects firm value.

There can be other arguments that suggest scale and scope per se can augment firm value. For example, a larger and more diversified firm can offer more varieties in career opportunities and higher job security to its managers. These benefits are attractive to managers; they are also conducive to investment in firm-specific human capital. Larger firms with a multitude of needs and a greater pool of heterogenous managerial talent may be able to arrange better matches in job assignments. Firms that carry out a high variety of activities may also be in a better position to discover new investment opportunities and hold more real investment options. There is genuinely no shortage of arguments that suggest scale and scope per se can be value augmenting.

On the other hand, agency problems and influence costs in diversified corporations are undoubtedly real and large. Diversified firms are harder to manage than one-industry firms. They are also less transparent to investors. Diversification increases top managers' job security by reducing firm-specific risks, and increases top managers' status and influence. Moreover, company size usually commences a wage premium. Also, as long as a manager's bonuses are tied to company profits, diversification reduces the volatility of the manager's income. Hence, managers are inclined to pursue diversification even if it hurts firm value. Recent empirical work shows that a sort of corporate socialism affects diversified firms: all divisions are entitled to their even share of the capital expenditure budget regardless of their actual investment opportunities. Yet, diversification

9

discount on firm value is reduced when a diversified firm has a CEO with a larger pay-performance sensitivity, a higher level of insider ownership, and a smaller board. (See, e.g. Palia (1998)).

The above arguments imply that corporate diversification, or just sheer size, can augment firm value when a firm possess enough intangible assets. In other words, firms with more intangible assets can have a farther out boundary. Diversification or size per se may positively affect firm value due to efficiency created by internal capital market (including human capital), and it may also negatively affect firm value due to agency problems and influence costs.

In the empirical work below, we decompose the impact on firm value by diversification or sheer size into two components: one related to information-based assets, and another unrelated to them. We interpret the former as capturing the effect of increased diversification in the presence of intangibles (i.e. due to internalization) and the latter as capturing other effects of diversification - presumably including the effects due to agency problems, influence costs, internal financial and human capital markets.

III Methodology

In the cross section analysis, our methodology is to regress various measures of firms' **Tobin's q ratios** on control variables and on measures of **firm size** and the **extent of diversification**. We are basically assuming that financial markets value firms efficiently. Thus, a firm's market value, the net present value of the cash flows its investors anticipate, V is

$$V = PV(c_1, c_2, c_3, ...) \tag{1}$$

The value of the assets the firm is using to generate these cash flows is A. Tobin and Brainard (1977) define a firm's average q as its market value divided by the replacement value of its assets. Thus,

$$q \doteq \frac{V}{A} \tag{2}$$

A capital investment's net present value or *NPV* is the difference between the expected present value of its future cash flows and its cost. Since "cost" for capital budgeting purposes and "replacement cost" are similar,

$$NPV \doteq PV(c_1, \ c_2, \ c_3, \ ...) \ \& \ A \tag{3}$$

Tobin and Brainard (1977) therefore consider q as

$$q \doteq \frac{V}{A} \doteq 1 \ \% \ \frac{NPV}{A} \tag{4}$$

where *NPV* is the combined net present values of all the firm's activities, its "intangible edge", so to speak. Our regressions are of the form

$$q \doteq \beta_0 \ \% \ \beta_1 i_1 \ \% \ \beta_2 i_2 \ \% \ \beta_3 i_3 \ \% \ ... \ \% \ \beta_n i_n \ \% \ \varepsilon \tag{5}$$

where each i_j is a proxy for a given type of positive or negative *NPV* per dollar of tangible assets. Since the assets that make up A are usually tangible assets, the i_j can be viewed as proxies for intangible assets or liabilities. Abstracting from tax considerations and other market imperfections, β_0 should be one and the other coefficients should be either positive or negative as the ith variable proxies for an intangible asset or intangible liability. These intangibles should include information-based assets related to activities as well as firm scale or scope.

We are interested in the coefficients of variables that measure information-based assets, scope or scale, and interactions between information-based assets and scale or scope. We model our

interaction terms as varying parameter coefficients. That is, we decompose the β_js that measure scope or scale into

$$\beta_j \ ' \ \gamma_0 \ \% \ \gamma_1 \times information\&based \ assets \qquad\qquad (6)$$

so that our regressions become

$$
\begin{aligned}
q \ ' \ & \beta_0 \ \% \ \beta_1 \ \left[\substack{information\& \\ based \ assets}\right] \ \% \ \beta_2 \ \left[\substack{scope \ or \\ scale}\right] \ \% \ ... \ \%\varepsilon \\
' \ & \beta_0 \ \% \ \beta_1 \ \left[\substack{information\& \\ based \ assets}\right] \ \% \ \left(\gamma_0 \ \% \ \gamma_1 \ \left[\substack{information\& \\ based \ assets}\right] \ \right) \ \left[\substack{scope \ or \\ scale}\right] \ \% \ ... \ \%\varepsilon \qquad (7) \\
' \ & \beta_0 \ \% \ \beta_1 \ \left[\substack{information\& \\ based \ assets}\right] \ \% \ \gamma_0 \ \left[\substack{scope \ or \\ scale}\right] \ \% \ \gamma_1 \ \left[\substack{information\& \\ based \ assets}\right] \times \left[\substack{scope \ or \\ scale}\right] \ \% \ ... \ \%\varepsilon
\end{aligned}
$$

If the primary effect of firm scope or scale is to facilitate the internalization of markets for information-based assets, we expect γ_0 to be zero and γ_1 to be positive (and thus β_1 to be positive also). If synergies unrelated to information-based assets, like internal capital market effects, add value, γ_0 should be positive. If expanded scope and scale amplify agency problems and that dominate synergies unrelated to information-based assets, γ_0 should be negative. If our reading of the literature is correct, and an interplay of internalization and heightened agency problems is involved, γ_0 should be negative while γ_1 is positive.

Our way of identifying the positive internalization based benefits of scale and scope is admittedly imperfect; but its weakness biases against finding positive results. The identifier is a positive γ_1, which indicates a positive relationship between firm value and scale and scope diversification motivated by internalization. To determine a priori the correct type of internalization motivated scale and scope expansion is notoriously unreliable for outside observers, as our arguments illustrate when we discuss the difficulties in using SIC classification codes and historical correlation in cashflow to identify synergies between related businesses. If firms with intangibles

on average conduct the correct kind of scale and scope expansion, we shall observe a positive γ_1. However, some firms likely have conducted excess and/or inappropriate scale and scope expansion even though an internalization opportunity exists. If excess and inappropriate scale and scope expansion dominates, γ_1 would not be able to pick up the positive internalization effect. Its merely presence will weaken the possibility of finding a positive γ_1. Hence, finding a positive γ_1 is particularly noteworthy.

The second step in our empirical analysis is to ask whether corporate control transactions discipline unwarranted diversification and encourage under diversified firms to diversify. To do this, we classify firms into those that should diversify and those that should not. We argue that a firm should diversify if its estimated coefficient on scope is positive, that is, if

$$\beta_j \ ' \ \gamma_0 \ \% \ \gamma_1 \times information\&based \ assets \ > \ 0 \qquad (8)$$

In other words, a firm should diversify if it has sufficient internalization potential to overcome the negative effect of increased agency and influence costs problems. In contrast, a firm should not diversify if it has insufficient information-based assets to overcome the negative effect of heightened agency and influence costs problems, that is, with

$$\beta_j \ ' \ \gamma_0 \ \% \ \gamma_1 \times information\&based \ assets \ \# \ 0 \qquad (9)$$

We then note which of our firms have and have not already diversified. This allocates our firms into four categories[6]:

---

[6] Type III firms are those with unwarranted diversification which is the focus of the diversification value discount literature. Type II firms experience under-investment. Under-investment can be due to a variety of reasons, e.g., investment capital constraints.

	Already diversified	Not already diversified
Should be diversified	I	II
Should not be diversified	III	IV

This classification lets us ask which of our four categories of firms subsequently expanded. We can also ask which category of firms is most or least subject to market discipline in the form of hostile takeovers. Generally, do corporate control transactions discipline unwarranted diversification and encourage internalization? Answers to these questions serve as a further check of the validity of our results in step one. Conversely, they serve to check whether the market for corporate control changes firm diversification in the correct manner if our results in step one is valid.

IV Data

Cross Section Sample

We use 1978 data for our initial cross section analyses for two reasons. First, 1978 is in a "neutral" period when the value of average diversification appears to be in transition from the positive to the negative range. Second, 1978 is prior to the beginning of the merger wave in the 1980s, so we can observe how the market for corporate control deals with different types of diversified firms.

Our basic sample of U.S. manufacturing firms is from the *NBER Financial Master File* (Hall, 1988). This file contains market value-based estimates of debt and assets, allowing us to construct q ratios that are adjusted for inflation, important in the late 1970s. We supplement this with data from Compustat, particularly from Compustat's *Historical Industry Segment Research File* to estimate line of business q ratios. Firms are in our sample if we can estimate inflation-adjusted q's for 1976, 1977, and 1978. Our data on the geographic locations of U.S. firms' subsidiaries is from the *National Register -- International Directory of Corporate Affiliates* (1980/81), which reports 1978/9 data. The intersection of available data from these sources yields a basic cross-section

sample of 1,277 U.S. firms.

Scope and Scale Variables

To measure cross industry diversification, we use the **number of three digit SIC codes** in which the firm operates (*n3*) and also the **number of four digit SIC codes** (*n4*). These numbers are from S*tandard and Poor's Register of Corporations*, which lists a primary 4 digit industry and up to twelve secondary 4 digit industries for each firm. For robustness check, we replace *n3* by the **number of reported business segments** (*s3*) in each firm's accounting data that Compustat assigns to different three digit industries. Likewise, we replace *n4* by a four digit version of Compustat data. Finally, we also replace *n3* by *n2*, the **number of two digit SIC codes** in which a firm operates. All the replacements do not qualitatively change our results. Our reported regression results are based on *n3.*

To measure geographic diversification, we follow Morck and Yeung (1991) in using the **number of foreign nations** in which a firm has a subsidiary (*nats*). As a robustness check, we have repeated our analysis using the **number of foreign subsidiaries** the firm has. The results are almost identical to our reported results. To conserve space, we do not show them.

To measure sheer firm size, we use **total sales**, (*sales*). Since the raw value of the variable would introduce substantial heteroskedasticity into regression errors, we also employ a dummy variable set to one if the firm is in the top five percent of the sample by sales and to zero otherwise. As robustness checks, we also used the logarithm of sales, a rank transformation of sales, and an inverse normal of a rank transformation as well as dummies for the top one and ten percent of the sample. We also tried similar size measures based on total assets rather than sales. All give qualitatively similar results. We use only the raw sales variable and the top five percent dummy

because the coefficients of these are easy to interpret and because they result in (insignificantly) higher R^2s. We use heteroskedasticity consistent standard errors in regressions that include raw sales.

Our three scale and scope measures are clearly collinear. We therefore rely on F-tests as well as t-tests when we claim statistical significance.

Tobin's q*

The construction of Tobin*'s q is based on Linderberg and Ross (1981). We use an average for 1976 through 1978. Our q's are adjusted to reflect market value estimates for debt, inventories, plant and equipment, and other factors according to Hall (1988).

The purpose of our analysis is to compare diversified to undiversified firms. To do this, we must define what we mean by a "similar" undiversified firm. Several alternative approaches make economic sense.

We first *use q-μ_q*, the **firm's q ratio minus the average q ratio of all firms in its core industry**, as defined by S*tandard and Poor's Register of Corporations*. Econometrically, the approach is equivalent to injecting industry dummies as independent variables to control for fixed industry effects while q itself is the dependent variable. In these regressions, the economic question we ask is whether venturing beyond a firm's core business adds value.

A problem with this approach is that different levels of intangibles are "normal" in different industries. For example, the intangible asset of "consumer loyalty" may be more important to automakers than to brick making firms. This means different industries have different mean q ratios. Comparing a one industry firm and a conglomerate based in the same core industry to the same benchmark core industry q may be inappropriate.

The solution is the "chop shop" approach, pioneered by LeBaron and Speidell (1987), of using each firm's **q ratio minus a weighted average of industry average q ratios based on undiversified firms**. We follow Lang and Stulz (1994) in constructing this variable, but use two variants. The first (q - q_{pps}) uses industry segment sales to weigh pure play qs, while the second (q - q_{ppa}) uses industry segment assets.[7] The weights are constructed using *Compustat* Industry Segment data. Asset weights make more theoretical sense, but *Compustat* industry segment assets seldom add up to total assets, leaving an overhead to allocate arbitrarily (we divide it proportionally by assets). Segment sales generally add up to total sales, so sales weights avoid this problem. We use inflation adjusted q ratios throughout our "chop shop" calculations.

Unfortunately, an operational "chop shop" approach relies on reported industry segment information, and firms have considerable accounting discretion in defining segments. Pacter (1993), Harris (1995) and Hayes and Lundholm (1996) argue that firms strategically increase the number of segments they report. In particular, when overall firm performance is poor top managers add segments so as to isolate poor performance in divisions not run directly by the head office. The ensuing bias in cross-terms is difficult to predict. Furthermore, in constructing such "chop shop" qs, we find that a few industries contain no pure-play firms and we have to drop about 5.7% of our sample firms. Omitting firms in these industries might risk omitting instances of the most natural synergies. Fortunately, Lang and Stulz (1994) demonstrate that the "chop shop" methodology and an approach similar to our first alternative yield similar results.

None of our approaches is wholly satisfactory. We present cross sectional empirical results

---

[7] Some industries do not have pure play firms. It is possible to infer their pure play q, however. Suppose industry A does not have pure play firms. Yet, there are firms operating in both industry A and B and industry B has pure play firms. We can then use these diversified firms' qs, their segment weights, and industry B's pure play q to infer industry A's pure play q. The procedure allows us to identify most industries' pure play q. We drop firms affected by industries for which we cannot infer their pure play qs. We lose 73 out of 1277 observations (5.7%).

using all our various q measures and argue that the consistency of our findings across these different definitions makes a spurious result unlikely.

Intangibles

We consider intangibles related to R&D and marketing, as these are most frequently connected with economies of scale (Helpman, 1984; Caves, 1985). Following Morck and Yeung (1991), we use **research and development spending per dollar of tangible assets** (*rd/a*) to proxy for production related intangibles and **advertising spending per dollars of tangible assets** (*adv/a*) to proxy for marketing related intangibles[8]. These variables are again averages for 1976, 1977, and 1978. If a firm for which all other accounting data is available does not report R&D or advertising spending, or reports either to be "nil", the variable in question is set to zero.

We are not able to proxy for intangibles related to superior management or other intangibles. That is certainly not the most desirable. However, from a practical point of view, firms high on management skills are also high on the ability to produce and market. Hence, our production and marketing intangible proxies may also be capturing superior management. Concerned with the missing variable problem, we examine whether our regressions have a heteroskedasticity problem.

We deliberately omit proxies for "growth" or "past success". It makes sense to include such variables when it is necessary to control for the present value of future growth opportunities in general. Since the purpose of our study is to explore the detailed nature of these growth opportunities, including such broad brush variables is inappropriate and would amount to "double counting".

---

[8] Using sales instead of total dollars of tangible assets to scale research and development and advertising spending does not affect our results.

18

Control variables

We control for industry effects, with either three digit or four digit **primary industry dummies**, as assigned by S*tandard and Poor's Register of Corporations, Directors and Executives*. Controlling for fixed industry effect is a necessity when the dependent variable is a firm's raw q. When the dependent variable is the chop-shop q, it is still useful to include industry dummies to control for remaining fixed effects. Our results based on the chop-shop qs do not change qualitatively when industry dummies are omitted although the significance level drops slightly.

We also include a capital structure variable, **long term debts per dollar of tangible assets** (*d/a*). This is also an average for 1976, 1977, & 1978. We include this variable because intangible assets make poor collateral, so firms whose assets are more tangible may have a higher leverage ratio.

Follow Up Study Variables

We follow our cross section of firms from 1979 to 1985. We opt for this window on the grounds that it is long enough to allow the market for corporate control to function. Too short a window would give us too little M&A activity, while too long a window might let firm characteristics change too much. Also, we stop in 1985 because the market for corporate control changed qualitatively in the late 1980s, possibly due to state anti-takeover laws and the Tax Reform Act of 1986, among other things.[9] To the extent that our window is still too long, this should add noise and reduce the significance of our results.

During this period, our sample firms complete 245 **domestic acquisitions** of publicly traded targets and 110 **foreign acquisitions**. Meanwhile, 34.5% (441 firms) of our sample firms become

---

[9] See Mikkelson and Partch (1997).

take-over targets.

V Results and Discussion

Cross Section Results

Table 1a displays univariate statistics and Table 1b displays bivariate statistics for our cross section

variables. Note first that q is positively correlated with cross country diversification, but negatively

correlated with cross industry diversification. Also, cross-industry diversification measures are

negatively correlated with spending on intangibles while geographic diversification measures are

positively correlated with R&D spending. The observations suggest that geographic and cross-

industry diversification are clearly economically significantly different.[10] This portends the

possibility that geographic diversification is more synergistic from the internalization perspective,

while cross-industry diversification is more fecund with value reducing problems. Note also that

firm size is uncorrelated with q. Our measures of intangibles, R&D and advertizing over assets, are

positively correlated with q and debt is negatively correlated with q.

[Tables 1a and 1b about here]

In Table 2, we display our multivariate cross-sectional regressions, which are of the form

$$q = \Sigma\, v_i + \beta_1\, Debt/Assets + \beta_2\, R\&D/Assets + \beta_3\, Advertising/Assets$$
$$+ (\delta_0 + \delta_1\, R\&D/Assets + \delta_2\, Advertizing/Assets)\ (\textit{cross industry diversification}) \quad (10)$$
$$+ (\gamma_0 + \gamma_1\, R\&D/Assets + \gamma_2\, Advertizing/Assets)\ (\textit{geographic diversification})$$
$$+ (\eta_0 + \eta_1\, R\&D/Assets + \eta_2\, Advertizing/Assets)\ (\textit{firm size}) + \varepsilon$$

where *cross industry diversification* is the number of three digit industries the firm operates in,

---

[10] The preliminary results are consistent with known empirical results. For example, Doukos and Travlos (1988), Harris and Ravenscraft (1991), Kang (1993) and others find generally positive bidder returns in foreign acquisitions; whereas, Asquith, Brunner and Mullins (1983) and others consistently report negative or zero event day returns for bidders in domestic acquisitions.

geographic diversification is the number of countries it operates in, and *firm size* is either sales or the rank transformation of sales. Three digit industry dummies v_i are also included.

[Table 2 about here]

First note that the results are consistent across our two definitions of q. We repeated the analysis using a third variant of q, an industry segment assets-based "chop shop" q (not shown), and also obtained similar results.

Observe that δ_0 is uniformly negative and statistically significant, implying that cross-industry diversification in the absence of information-based intangibles is related to lower share value. In contrast, δ_1 is consistently positive and statistically significant, indicating that cross-industry diversification adds to shareholder value in the presence of R&D related assets. Cross-industry diversification appears less able to add value through advertising related intangibles since δ_2 is insignificant, though its sign is consistently positive.

The regressions in Table 2 use the number of 3 digit industry codes to measure cross-industry diversification. Using the number of four digit codes or the number of industry segments reported yields similar results. We also use the number of two digit codes to measure cross-industry diversification. We find that δ_0 becomes even more negative and remains highly significant. δ_1 also increases in magnitude. Its statistical significance drops slightly but is still within acceptable level except in 2.8. δ_2 remains very insignificant and its sign is occasionally negative. (All other regression coefficients are not materially affected.) Conventionally, cross-industry diversification into 2 digit industries is often regarded as "unrelated." Thus, it is not surprising that δ_0 appears to become even more negative. The observation that δ_1 remains significant and positive adds credence to our internalization argument.

Geographic diversification also adds value mainly in the presence of R&D related

intangibles, as γ_1 is consistently positive and significant. Both γ_0 and γ_2 are insignificant, suggesting that geographic diversification in the absence of R&D is valueless, but also innocuous. Similar results follow if we use the number of foreign subsidiaries, rather than the number of countries the firm operates in, to measure geographic diversification.[11]

An F-test rejects the hypothesis that δ_0 and γ_0 are equal. The higher γ_0 indicates that geographic diversification has higher non-internalization related positive synergies while value reducing agency problems are more prevalent in cross industry diversification.

Sheer firm size is first measured by total sales. Since including raw sales figures as an independent variable creates heteroskedasticity problems, Table 2 displays consistent standard errors as in White (1980) for these regressions. The pattern of significance using ordinary standard errors is similar. In the absence of information-based intangibles, large firm size is associated with depressed firm value, as η_0 is significantly negative in regressions 2.3 and 2.7. Firm size is correlated with added shareholder value if information-based intangibles are present, but here advertising related intangibles appear more important than R&D related intangibles. The estimate of η_2 is positive and significant while η_1 is insignificant.

Intriguingly, when we replace sales by its rank, the interaction terms both become insignificant and firm size becomes positively correlated with q. Replacing sales by its logarithm generates intermediate results with coefficients between those of the raw and rank sales specifications. The rank transformation converts a highly skewed distribution ($\sigma^3/\sigma^2 \, \sigma = 11.9$) to

---

[11] The results are consistent with studies of the impact of international acquisition on firm value. Doukos and Travlos (1988), Morck and Yeung (1992), Kang (1993), and others find that bidder returns in foreign acquisitions tend to be positive, in contrast to the negative or zero returns that Asquith, Brunner and Mullins (1983) and others find for bidders in domestic acquisitions. Consistent with this being due to internalization, Harris and Ravenscraft (1991) and others find that cross-border takeovers are more concentrated in R&D-intensive industries than are domestic acquisitions. Consistent with this reflecting internalization, Morck and Yeung (1991, 1992) find that geographic diversification adds value when the diversifying firm has substantial intangible, information-based assets, but destroys value otherwise. Harris and Ravenscraft (1991) also find that most international M&A activity is horizontal takeovers.

a uniform distribution, reducing the importance of very large firms. The logarithmic transformation similarly pulls in the right tail, though less severely. Apparently, a very large firm size is needed to gain value from a big advertising budget. From this, we conclude that the absolute values of sales, not their relative values, matter; and that most of the explanatory power comes from very large firms whose squared deviations from mean sales are the largest.

Accordingly, we replace sales by a dummy variable set to one if a firm's sales place it in the largest 5% and set to zero otherwise. Regressions using this dummy to measure size are shown in columns 2.4 and 2.8, and mimic the findings in 2.3 and 2.7, though the parameter estimate of η_0 is now insignificant. If we use the largest 1% or the largest 10%, we obtain qualitatively similar results with virtually identical R^2s. Using the top 25% or the top 50% produces results similar to those from the logarithm or rank transformed sales.

As a further robustness check, we reproduced all the above calculations using total fixed assets rather than sales as the basic size measure and obtained qualitatively similar results.

Discussion

A "first pass" interpretation of our results is that cross industry diversification, geographic diversification, and sheer size create value through the internalization of markets for information-based intangibles. However, cross industry diversification and large size in the absence of such intangibles destroy value - presumably because of heightened agency problems that internal capital market benefits, even if they are present, cannot overcome.

Our findings do not contradict previous results in the literature. Our results say that cross industry diversification is usually negative. Our regressions are of the form

$$q = (\delta_0 + \delta_1\ R\&D/A + \delta_2\ Adv/A)\ (cross\ industry\ diversification) + other\ terms \qquad (11)$$

For cross-industry diversification to create value, it must be the case that

$$\delta_0 + \delta_1 \, R\&D/A + \delta_2 \, Adv/A > 0 \tag{12}$$

Assume δ_2 to be zero since it is statistically insignificant, condition 12 reduces to

$$R\&D/A > -\delta_0/\delta_1 \tag{13}$$

If we take averages across all the specifications in Table 2, we have that $-\delta_0/\delta_1$ averages to 0.0621. (If we take average across only regressions 2.3 and 2.7, $-\delta_0/\delta_1$ averages to 0.0647.) The mean of $R\&D/A$ from Table 1 is $\mu_{R\&D} = 0.0239$ and the standard deviation is $\sigma_{R\&D} = 0.0395$. Thus, $-\delta_0/\delta_1$ is roughly equal to the mean R&D spending plus one standard deviation (expressed as percentages of assets). In other words, only a small subset of firms whose

$$R\&D/A > \mu_{R\&D} + \sigma_{R\&D}. \tag{14}$$

can add value through cross industry diversification, and the majority of firms do not. Hence, researchers tend to find that cross industry diversification is value decreasing on average.

We can use analogous procedures to determine whether each firm should diversify geographically or not, and whether each firm should endeavor to achieve great size. We can then classify our firms as to whether or not they should acquire each of our three dimensions of scope and scale diversification; and as to whether they have already done so or not. These classifications are shown in Table 3[12].

[Table 3 about here]

Panel A of Table 3 shows that firms whose past diversification destroyed shareholder value

---

[12] The classification is based on the average of the regression coefficients in regressions 2.3, 2.4, 2.7 and 2.8. (Using only regression coefficients in regression 2.3 and 2.7 yield similar results.) For each company, we construct an estimate as depicted in equation 12. We recognize that some of these point estimates are not statistically significant. Keeping them in the sample adds noise to our classifications and thus to our follow-up study. The noise will make statistical significant results in our follow-up study less likely and thus finding such results is particularly noteworthy.

outnumber by roughly ten to one firms whose diversification added to shareholder value. Indeed, having potential value decline from diversification is actually significantly correlated with being diversified (t = 3.85).[13] This is consistent with Lang and Stulz, (1994), Berger and Ofek (1995, 1996), John and Ofek (1995), Servaes (1997), Stein (1997), Denis *et al.* (1997), Rajan *et al.* (1997), Shin and Stulz (1997), Scharfstein (1997) and others. Our results suggest that cross industry diversification is associated with value destruction in most cases because most diversified firms do not possess adequate intangible assets.

However, we can also reconcile this literature on value creating diversification with Rumelt (1982), Schipper and Thompson (1983), Matsusaka (1993), and Hubbard and Palia (1997) and others, who find that cross-industry diversification can add value. In particular, our findings support the view of Matsusaka (1997) that specific synergies may exist between firms in different industries and that diversifying firms are searching for these. Our results suggest that these synergies generally involve applying intangibles from one industry in another.

If we assume that the negative relationship of scale and scope variables with firm value is due to dominant agency problems, the contrast between Panel A and the remaining panels in Table 3 suggests that these problems are less plethoric in geographical diversification and horizontal expansion than in cross- industry diversification. Unlike cross-industry diversification, geographic diversification is significantly more prevalent (t=8.00) among firms that possess intangibles that make such diversification an asset. Large size is also significantly more common (t = 3.00) among firms that possess intangibles that would render large size an asset. While the number of value

---

[13] The t-ratio of 3.85 is from a *t*-test to reject the hypothesis that $b_1 = 0$ in the O.L.S. regression $d_0 = b_0 + b_1 d_1 + e$ where d_0 is a dummy variable set to one if the relevant coefficients in Table 2 indicate, on average, that the firm should diversify, and set to zero otherwise; and where d_1 is a dummy set to one if the firm is already diversified and to zero otherwise. A *t*-test to reject $b_1 = 0$ is algebraically equivalent to an *F*-test in an *ANOVA* setting to reject the hypothesis that the fraction of diversified firms that should be diversified equals the fraction of undiversified firms that should be diversified. More complex χ^2 tests yield virtually identical confidence levels. This footnote applies to other t-tests we report subsequently.

destroying cross-industry diversification is ten times the number of value creating cross-industry diversification, the number of value creating geographic diversification is 3.5 times the number of value destroying geographic diversification. Indeed, unwarranted cross industry diversification is 72% of the sample while unwarranted geographical diversification and sheer size expansion are, respectively, only 10% and 21% of the sample. The foreign direct investment literature emphasizes that local incumbents have home turf advantage over foreign entrants. Perhaps, the difficulties in breaking into foreign markets is a blessing in disguise; they mitigate unwarranted geographic diversification.

Follow Up Study Results

We conduct a follow up study on whether the market for corporate control disciplines unwarranted diversification and encourages synergy creating diversification as depicted in Table 3. We focus on the market for corporate control because it is a clear indicator of strategies designed to quickly alter firms scope and scale (i.e. firm boundaries). We follow the firms of our 1978 cross section until 1985 (i.e. the window is from 1979 to 1985)[14] and note in Table 4 what sorts of corporate control transactions they become involved in.

Panel A of Table 4 shows that 8.92% of the firms that should not have diversified across industries, but did anyway, undertook further cross industry takeovers. In comparison, significantly fewer other firms, only 2.79%, undertook diversifying takeover bids (t = 3.82). Surprisingly, none of the firms that should be diversified across industries, but are not, diversified *via* takeovers. This is significantly below the 7.47% average rate across the other categories (t = 1.93). If our

---

[14] The length of the follow up window, as we have discussed, is decided on the grounds that it is long enough to allow the market for corporate control to function. Too short a window would give us too little M&A activity, while too long a window might let firm characteristics change too much. Also, we stop in 1985 because the market for corporate control changed in the late 1980s due to state anti-takeover laws and the Tax Reform Act of 1986.

interpretation of our cross section results holds, the market for corporate control is facilitating value destroying takeovers and failing to spur value creating ones here. Alternatively, the targets of these takeovers may possess the information-based intangibles the firm needs to turn its diversified structure into an asset.

However, 10.7% of our 919 improperly diversified firms become the targets of hostile takeovers vs. a significantly lower (t = 2.65) hostile takeover rate of 5.87% among all other firms.[15] These improperly diversified firms are also significantly less likely than other firms to become the targets of friendly mergers (23% vs. 31.01%, t = 2.98). In contrast, the 46 firms that should diversify across industries but have not are significantly more likely than other firms to become the targets of friendly takeovers (37% vs. 24.78%, t = 1.87). These results are consistent with the market for corporate control targeting both excessively and insufficiently cross-industry diversified firms, *via* hostile and friendly takeovers, respectively.

Panel B of Table 4 shows that firms which have not diversified geographically, but should, are more likely than other firms to become friendly merger targets (28.8% vs. 23.53%, t = 2.02). They are also more likely than other geographically undiversified firms to make a first foreign acquisition: 9.51% do so vs 4.02% (t = 2.89). Firms that have diversified geographically, but should not have, are not significantly more likely than other firms to become hostile takeover targets, but are significantly less likely to be friendly merger targets (15.2% vs. 26.3%, t = 2.72). These results are consistent with the market for corporate control acting to correct a lack of geographic diversification when geographic diversification would add value, but not to correct excess geographic diversification.

---

[15] Our result here is consistent with Berger and Ofek (1996) who show that diversification value discount attracts takeovers. One purpose of our follow-up study is to validate our regression result which supports that diversification augments (decreases) firm value when it is conducted by firms with sufficient (insufficient) intangibles. We identify improperly diversified firms as those that do not have sufficient intangibles to warrant diversification, which is our explanation for diversification value discount.

Panel C shows that the 199 small firms with potential synergies from expansion are less likely than other firms to carry out takeovers (t = 1.61). These firms capital expenditure budgets are higher than those of other firms (3.30% of assets vs. 2.45% for other firms), but the difference is statistically insignificant. Still, these 199 prime candidates for expansion are significantly more likely than other firms to become takeover targets (41.2% vs. 33.3%, t = 2.16), and this is primarily due to more becoming friendly merger targets (32% vs. 24.3%, t = 1.75). They are not significantly more likely than other firms to become hostile takeover targets. Again, friendly mergers appear to be used to capture unexploited synergies.

In contrast, the 267 firms that have insufficient synergy producing intangibles to justify a large scale of operations have smaller capital budgets than other firms (1.48% of assets vs. 2.88% for other firms) and this difference is statistically significant (t = 2.01). They are, however, much more likely than other firms to launch takeover bids (17.2% vs. 6.53%, t = 5.28). They are also much more likely than other firms to become hostile takeover targets (13.5% vs. 8.12%, t = 2.64) and much less likely to become friendly merger targets (18.4% vs. 27.4%, t = 2.91). However, large firms that should not be large are less likely than large firms that should be large to become hostile takeover targets and more likely to become friendly takeover targets. Hence, the success the market for corporate control in disciplining larger firms that should not be large is not clear cut.

Conjecture

Previous studies show that markets valued diversification across industries more highly in earlier decades than now. Our findings suggest where to seek reasons for this change.

If the value of diversification depends on a trade-off between its added value from leveraging the value of intangibles (and/or providing an internal capital market) and the value it costs by

exacerbating agency problems, regime changes that affect this trade-off should affect the value of diversification. The following is therefore our conjecture.

In the 1960s and early 70s, markets for information-based goods were less developed than now, especially outside the US and a few other advanced economies. This made internalizing the markets for these assets essential to achieving their full value. Very large scale and scope should have added more value then. We conjecture that the value of internalization should change over time. As firms and governments grew more able to protect intellectual property rights, liscencing agreements and the like plausibly became more realistic alternatives, and internalization less essential. Increased transparency due to better accounting standards, more sophisticated investors, and more competition for their savings may also have lead to less tolerance of agency problems. We hypothesize that the trade-off has therefore shifted towards less diversification. Even in international M&A, better intellectual property rights protection may be reducing the gains from larger scale and scope.[16]

Our findings echo theories about "internal capital market synergy." In the 1960s and early 1970s, financial markets and institutions were less developed than now, and regulation impeded external financing. Head office financial management acting as an internal bank might have been an additional intangible asset then - adding value when applied across larger scales or broader scopes of operation. Now, with financial markets deregulated and developed, centralized financing has less value and the trade-off has shifted. Reducing agency problems now dominates and increased focus is the recommended way to do this. In countries with poorly developed financial systems and little protection for intellectual property, diversification across industries continues to

---

[16] Christophe (1997) reproduces the 1970s findings of Morck and Yeung (1991), but finds that their result no longer exists in the 1980s, and concludes that this is due to increased exchange rate volatility. Without contradicting this, our findings suggest that better international intellectual property rights protection might be an additional factor.

add value. (Khanna and Palepu, 1997).

Caveats

This research is suggestive in nature and is clearly preliminary. It is useful to highlight some caveats.

The notable feature of the regression results in Table 2 is that diversification is associated with higher firm value only for firms with adequate intangible assets, and is associated with lower firm value for other firms. Our interpretation is that diversification *per se* is on average value decreasing, but greater scale and scope operations are appropriate and value enhancing for firms possessing considerable intangible assets, which "internalization" predicts. We want to be cautious on the robustness of our interpretation. Moreover, we hasten to point out that our results do not lead to causality claims.

It has been suggested that our result is consistent with that higher q firms are more diversified and, being more diversified, are less capital constrained and thus spend more on R&D. Here, the focus is on cross-industry diversification. Contrary to the idea, we find in Table 1b that higher q firms are typically less cross-industry diversified and more cross-industry diversified firms typically spend less on R&D. Moreover, the idea does not explain why many diversified firms do not spend on R&D and suffer from diversification value discount.

One interpretation of the suggestion is that high q firms are more diversified first and then spend more on intangibles. Our cross-sectional regression will not shed light on the time sequence of diversification and investment on intangibles. A time series study in the form of a Granger causality may be revealing. In a study focusing only on geographic diversification, Mitchell, Morck, Shaver, and Yeung (1998) show using a Granger causality test that firms tend to diversify

geographically before they increase their spending on intangibles. They, however, show that only investment in intangibles increases firm profits, geographic diversification does not. Moreover, Morck and Yeung (1992), using regression analyses, show that the abnormal return on foreign acquisition is positively related to past spending on intangibles. These results unambiguously suggests that greater scale and scope operations are value enhancing for firms possessing considerable intangible assets, which "internalization" predicts.

Albeit the above, our regression results are also consistent with low q firms that have few intangibles using diversification to search for their "right" industry (Matsusaka 1997) while high q firms with copious intangibles find that their capabilities match with many industries and thus are more diversified.

Our results do not imply that sheer investment in R&D and advertising spending necessarily make size growth and diversification value enhancing. R&D and advertising spending can be excessive or misdirected. Also, poor management can squander such investment. We use R&D and advertising spending only to proxy for intangibles related to production and marketing. If there were better proxies, we would prefer to use them. Using past R&D and advertising spending to proxy for production and marketing intangibles is a common practice that has generated consistent results. However, that merely means excessive or misdirected R&D and advertising spending is not common enough to render the proxies ineffective. Shooting for the proxies *per se* does not necessarily lead to true possession of the underlying intangibles.

We may have omitted other types of intangibles in our study. For example, we have not been able to capture management skills in this study. However, to the extent that firms possessing high management skills also possess high production and marketing skills, our production and marketing intangible proxies may have captured high management skills too. Omitting important intangibles

leads to a missing variable problem that causes heteroskedasticity. We therefore use White's (1980) heteroskedasticity consistent t-tests wherever necessary.

In our post 1978 study, our main claim is that firms that should not diversify, but have, are more likely to become hostile takeover targets, while firms that should be diversified, but have not, are more likely to become friendly takeover targets. To the extent that, in the early eighties, hostile takeovers were a mechanism for increasing corporate focus, and friendly takeovers a way of achieving synergies, the market for corporate control is consistent with our assessment of which firms' boundaries should expand and which firms' boundaries should shrink.

However, to convincingly argue that the market for corporate control appropriately redefines firm boundaries, we need more information. For instances, we would like to check whether under diversified firms are acquired by diversified firms and/or they experience active diversification after being taken over. Also, we would like to check whether firms with excess diversification are acquired by firms with high level of intangibles and/or they experience active divestiture after being taken over.

The existing literature, however, contains useful information. Mitchell and Lehn (1990) shows that firms that make value reducing acquisitions subsequently tend to become takeover targets themselves. Moreover, the subsequent acquirers then tend to divest the target's value decreasing acquisitions. Berger and Ofek (1996) find that diversification value discount increases the likelihood of being taken over. Furthermore, for a sub-sample of large diversified targets higher value diversification discount increases the extent of post-takover bustup which generally results in divested divisions being operated as part of a focused stand-alone firm. Daley et al (1997) find that cross-industry spinoffs generate value for the divesting firm, but same industry spin-offs do not. This is associated with improved operating performance in the divesting firm following cross

industry spin-offs.

VI Conclusions

Our findings support the view that synergy derives, at least in part, from the wider application of information-based intangible assets, such as those stemming from investment in production and marketing skills. Because they are information-based, these assets can be profitably applied to multiple businesses and locations simultaneously. They are "non-rivalrous goods" in the sense that their use in one place does not physically preclude their simultaneous use elsewhere. These assets thus have large returns to scale and scope. However, high transaction costs due to information asymmetry make capturing these returns difficult *via* armslength contracts. A solution for a firm to obtain value from expanding the application of its intangibles to other firms' operations is to "internalize" the market for these intangibles by acquiring the productive assets of the other firms.

We find that cross industry diversification is correlated with higher shareholder value if the diversifying firm has substantial information-based intangible assets. Otherwise, cross-industry diversification is correlated with lower shareholder value. Geographic diversification is also accompanied by increased share value when information-based intangibles are present, but has little relationship with value otherwise. Sheer firm size is related to depressed share values in the absence of intangibles, but to higher share values in their presence. Intangibles related to R&D seem most important in adding value to cross-industry and geographical diversification. Intangibles related to advertising seem most important in forging value from sheer firm size. From these findings, we infer that expanded scale and scope may add value in the presence of information-based intangible assets, but may destroy value otherwise.

To further validate our results, we conduct a follow up study on our sample firms. Firms

with substantial intangibles, but that had not diversified across industries, diversified geographically, or become very large, were designated as having untapped diversification benefits. They were significantly more likely than other firms to become the targets of friendly takeovers. Friendly takeovers in the 1980s were seldom disciplinary devices, but instead appear to have been aimed at achieving synergies. From this, we conclude that synergy in a takeover is related to the target having substantial intangible assets while also being small or undiversified.

Firms that had initially been diversified across industries, but that had relatively few intangible assets, were designated as having conducted unwarranted diversification. These firms were significantly more likely than other firms to become hostile takeover targets. Since hostile takeovers in the early eighties appear to have been a mechanism for increasing corporate focus, this suggests that the market for corporate control viewed diversification as a cause of low share value in these firms.

An interesting observation in our study is that, at the end of the seventies, there was too little geographic diversification, in that many firms with adequate intangibles that should have diversified geographically did not. At the same time, there was too much cross-industry diversification in the sense that many firms without adequate intangibles were diversified across industries. The wave of foreign direct investment by US firms and the surge of foreign acquisition in the US may be the market's response to the untapped geographic diversification potential. At the same time, our follow-up study suggests domestic hostile takeovers were a disciplinary response to unwarranted diversification.

We conclude that cross industry diversification, geographic diversification, and firm size add value in the presence of intangibles related to R&D or advertizing, but destroy value in their absence. This is consistent with synergy stemming from the internalization of markets for

information-based assets. It is also consistent with the view that M&A synergies come from some matches, but not others. However, the requirement is not that the two firms must be in the same industry or country, but that one firm's operations can be improved by applying the R&D or advertising related intangibles of the other. This supports Livermore (1935), who found a similar relationship between intangible assets, like R&D or advertising, and superior post-takeover firm performance in the U.S. "turn of the century" merger wave.

The corporate diversification problem is important because it addresses precisely why some firms should control more resources while others should control fewer. The efficient allocation of resources is a fundamental concern in economics. Our results suggest that firms with more information based capabilities ought to control more resources. From a managerial perspective, the suggestion is that the development and possession of information based capabilities is the source for firm growth. The idea is consistent with the endogenous growth idea that is advanced, e.g., by Romer (1986). Information based asset is a production input which enhances the productivity of other inputs. Investing in information based assets leads to more productivity and thus more output. The increasing returns to scale come about because a new bit of information adds to the productive capacity of all existing information, capital and labor and allows more investment for the next period.

Table 1 A: Univariate Statistics

	mean	standard deviation	median	minimum	maximum
Scale and Scope Variables					
number of 3-digit SIC segments (***n3***)	3.83	2.59	3	1	12
number of 4-digit SIC segments (***n4***)	4.7	3.37	4	1	12
number of reported 3-digit SIC segments (***s3***)	1.46	1.06	1	1	9
number of foreign nations with a subsidiary (***nats***)	2.79	6.11	0	0	58
sales (***sales***)	887	3,469	146	.0770	63221
Firm Value Measures					
Tobin's q (***q***)	.839	.545	.680	.109	3.93
Tobin's q -prim. ind. av. (***q-μ_q***)	0	.471	-.0616	-1.27	2.73
Tobin's q - sales weighted average of pure play q's (***q - q_{pps}***)	-.0536	.487	-.111	-1.57	2.73
Tobin's q - asset weighted average of pure play q's (***q - q_{ppa}***)	-.0534	.487	-.110	-1.21	2.62
Information-based Intangible Asset Variables					
R&D spending per $ of tangible assets (***rd/a***)	.0239	.0395	.0086	0	.359
Advertising spending per $ of tangible assets (***adv/a***)	.0226	.0561	.0007	0	.772
Control Variables					
Leverage per $ of tangible assets (***dl/a***)	.247	.155	.231	0	0.899

Sample size: 1,277 firms for all variables except for: $q - q_{pps}$ and $q - q_{ppa}$, for which only 1,205 firms are available; bidder abnormal return, available for 242 bids; bidder return in foreign takeovers which exists for 110 bids; and capital expenditure growth, available for 773 firms.

Table 1 B: Simple Correlation Coefficients.

	measures of scope and scale					measures of firm value				intangibles		debt
	n3	n4	s3	nats	sales	q	$q-\mu q$	$q - q_{pps}$	$q - q_{pp}$	rd/a	adv/a	d/a
n3	1.00 (.00)	.939 (.01)	.225 (.01)	0.158 (0.01)	.114 (.01)	-0.108 (0.01)	-0.08 (0.01)	-0.073 (0.01)	-0.073 (0.01)	-.0918 (.01)	-.0823 (.01)	.0497 (.08)
n4		1.00 (.00)	.212 (.01)	0.177 (0.01)	.135 (.01)	-0.106 (0.01)	-0.07 (0.01)	-0.061 (0.03)	-0.06 (0.04)	-.0968 (.01)	-.0692 (.01)	.0323 (.25)
s3			1.00 (.00)	0.005 (0.01)	-.0104 (.01)	-0.119 (0.01)	-0.106 (0.01)	-0.115 (0.01)	-0.114 (0.01)	-.0881 (.01)	.0016 (.96)	0.0476 (.09)
nats				1.00 (.00)	.340 (.01)	0.145 (0.01)	0.0929 (0.01)	0.0981 (0.01)	0.0983 (0.01)	.106 (.01)	.0320 (.24)	-0.054 (.05)
sales					1.00 (.00)	-0.01 (0.8)	0.01 (0.73)	0.0187 (0.52)	0.018 (0.53)	.0090 (.75)	-.0195 (.48)	-.0950 (.01)
q						1.00 (.00)	0.864 (0.01)	.837 (.01)	.837 (.01)	.313 (.01)	.108 (.01)	-.0900 (.01)
$q-\mu q$							1.00 (.00)	.956 (.01)	.955 (.01)	.129 (.01)	.0175 (.53)	-.109 (.01)
$q - q_{pps}$								1.00 (.00)	1.00 (.01)	.0878 (.01)	-.0011 (.97)	-.115 (.01)
$q - q_{ppa}$									1.00 (.00)	.0872 (.01)	-.0006 (.98)	-.114 (.01)
rd/a										1.00 (.00)	.0938 (.01)	.0454 (.11)
adv/a											1.00 (.00)	-.0584 (.04)

Sample size: 1,277 firms for all variables except for: $q - q_{pps}$ and $q - q_{ppa}$, for which only 1,205 firms are available. Numbers in parentheses are significance levels. Variables are as defined in panel A of this table. Boldface type indicates statistical significance at 10% confidence or better in a one-tailed t-test.

Table 2: OLS regression of Tobin's q on scope and scale variables and cross-terms of these with proxies for information-based intangibles (R&D and advertising over assets) controlling for intangibles levels, debt, and three digit industry codes. The dependent variable in regressions 2.1 through 2.4 is q; in regressions 2.5 and 2.8 it is q relative to segment sales weighted averages of the qs of undiversified firms in the industries in which the firm operates.

		Inflation Adjusted q ratio				Segment Sales "Chop Shop" q ratio			
		2.1	2.2	2.3a	2.4	2.5	2.6	2.7a	2.8
δ_0: Cross Industry Diversification number of 3-digit SIC segments (**n3**)		**-.030**	**-.028**	**-.027**	**-.027**	**-.030**	**-.028**	**-.028**	**-.027**
		(-4.08)	(-3.76)	(-4.38)	(-3.67)	(-3.82)	(-3.55)	(-4.11)	(-3.47)
δ_1: Cross Industry Diversification x R&D over assets (**n3 x RD/A**)		**.614**	**.400**	**.416**	**.402**	**.606**	**.415**	**.434**	**.417**
		(3.27)	(2.05)	(1.97)	(2.05)	(3.12)	(2.05)	(2.06)	(2.05)
δ_2: Cross Industry Divers. x Advertizing over assets (**n3 x Adv/A**)		.176	.194	.094	.158	.136	.157	.035	.120
		(1.26)	(1.39)	(.67)	(1.12)	(.94)	(1.08)	(.23)	(.81)
γ_0: Geographic Diversification number of foreign nations with a subsidiary (**nats**)			.0001	.00278	.0011		.0005	.0031	-.0015
			(.04)	(.58)	(.30)		(.13)	(.61)	(-.38)
γ_1: Geographic Diversification x R&D over assets (**nats x RD/A**)			**.185**	**.158**	**.180**		**.157**	.130	**.153**
			(2.85)	(1.79)	(2.75)		(2.36)	(1.37)	(2.27)
γ_2: Geographic Diversification x Advertizing over assets (**nats x Adv/A**)			.021	-.0070	.0030		.033	.003	.014
			(.51)	(.13)	(.06)		(.78)	(.05)	(.31)
η_0: Firm Size (**size** is either **sales** or a 95th percentile dummy)				**-.00001**	-.126			**-.00001**	-.125
				(-2.73)	(-1.24)			(-2.72)	(-1.18)
η_1: Firm Size x R&D budget over assets (**size x RD/A**)				.0001	1.70			.0001	1.73
				(.81)	(.69)			(.81)	(.68)
η_2: Firm Size x Advertizing budget over assets (**size x Adv/A**)				**.0005**	**3.20**			**.0006**	**3.29**
				(1.79)	(1.67)			(2.06)	(1.68)
Firm Size Measure Used				raw	dummy			raw	dummy
β_2: R&D spending per $ of tangible assets (**rd/a**)		**1.01**	**1.04**	**1.00**	**1.03**	.653	.695	.648	.675
		(1.64)	(1.69)	(1.31)	(1.67)	(1.03)	(1.10)	(.90)	(1.07)
β_3: Advertising spending per $ of tangible assets (**adv/a**)		-.497	-.595	-.477	-.480	-.54	**-.695**	-.563	-.576
		(-1.15)	(-1.30)	(-.87)	(-1.04)	(-1.21)	(-1.45)	(-.99)	(-1.18)
β_1: Leverage per $ of tangible assets (**d/a**)		**-.366**	**-.357**	**-.364**	**-.358**	**-.365**	**-.357**	**-.362**	**-.357**
		(-3.78)	(-3.70)	(-3.35)	(-3.7)	(-3.64)	(-3.57)	(-3.20)	(-3.55)
v: 3 digit industry code dummies		yes	yes	yes	yes	yes	yes	yes	yes
R^2		.297	.308	.311	.310	.098	.110	.116	.113

Sample size is 1,277 firms for regressions of q, 1,205 firms for regressions of $q - q_{pp}$. Numbers in parentheses are t ratios. Boldface type indicates statistical significance at 10% confidence or better in a one-tailed t-test.

a. White (1980) adjusted t-ratios are used for these regressions to control for heteroskedasticity induced by the raw sales variable.

Table 3. The relationship between value enhancing potential in cross industry diversification, geographic diversification and sheer size and actual cross industry diversification, geographic diversification and firm size. Tables contain numbers of firms in each category.

Panel A		Firm Is Diversified Across Industries	
		Yes	No
Should Be Diversified Across Industries	Yes	92	46
	No	919	220

Panel B		Firm Is Diversified Across Countries	
		Yes	No
Should Be Diversified Across Countries	Yes	419	410
	No	125	323

Panel C		Is Larger than Industry Average	
		Yes	No
Should Be Larger than Industry Average	Yes	115	199
	No	267	696

Table 4. Successful Corporate Control Transactions Involving Firms in the Cross Section Sample and Occurring Between 1979 and 1985.

Panel A		Is Diversified Across Industries		
		Yes	No	
Should Be Diversified Across Industries	Yes	4.35	.00	*% launching takeovers*
		4.35	6.52	*% that are target of successful hostile takeover*
		26.1	37.0	*% that are target of successful friendly merger*
		3.4	43.5	*% that are target of successful control transaction*
		(92)	(46)	*number of firms in subsample*
	No	8.92	2.73	*% launching takeovers*
		10.7	6.36	*% that are target of successful hostile takeover*
		23.0	31.8	*% that are target of successful friendly merger*
		33.6	38.2	*% that are target of successful control transaction*
		(919)	(220)	*number of firms in subsample*

Panel B		Is Diversified Across Countries		
		Yes	No	
Should Be Diversified Across Countries	Yes	12.6	9.51	*% launching foreign takeovers*
		9.31	11.2	*% that are target of successful hostile takeover*
		22.9	28.8	*% that are target of successful friendly merger*
		32.2	39.0	*% that are target of successful control transaction*
		(419)	(410)	*number of firms in subsample*
	No	11.2	4.02	*% launching foreign takeovers*
		12.0	7.13	*% that are target of successful hostile takeover*
		15.2	27.6	*% that are target of successful friendly merger*
		27.2	34.7	*% that are target of successful control transaction*
		(125)	(323)	*number of firms in subsample*

		Is Larger than Industry Average		
		Yes	No	
Should Be Larger than Industry Average	Yes	17.4	5.53	*% launching takeovers*
		2.36	3.30	*% annual growth rate in inflation adjusted assets*
		17.4	11.1	*% that are target of successful hostile takeover*
		15.7	32	*% that are target of successful friendly merger*
		33.0	41.2	*% that are target of successful control transaction*
		(115)	(199)	*number of firms in subsample*
	No	17.2	5.03	*% launching takeovers*
		1.48	2.84	*% annual growth rate in inflation adjusted assets*
		13.5	5.89	*% that are target of successful hostile takeover*
		18.4	28.0	*% that are target of successful friendly merger*
		31.8	33.9	*% that are target of successful control transaction*
		(267)	(696)	*number of firms in subsample*

References

Asquith, Paul R., R. F. Brunner and David W. Mullins 1983. "The gains to bidding firms from merger" *Journal of Financial Economics*, Vol.11, pp. 121-14.

Bagwell, Laurie Simon and Zechner, Josef. 1993. "Influence costs and capital structure." *Journal of Finance* July, Vol. 48 no. 3, pp. 975-1008.

Baumol, William. 1959. *Business Behavior: Value and Growth*. MacMillian, New York.

Berger, Philip G. Eli Ofek. 1996. Bustup takeover of value-destroying diversified firms. *Journal of Finance,* Sep, Vol. 51 no. 4, pp. 1175-1200.

Berger, Philip G. and Eli Ofek, 1995, "Diversification's effect on firm value" *Journal of Financial Economics*, Jan, Vol. 37 no. 1, pp. 39-65.

Bradley, Michael. Desai, Anand. and Kim, E. Han. 1988. Synergistic gains from corporate acquisitions and their division between the stockholders of target and acquiring firms. *Journal of Financial Economics* May, Vol. 21 no. 1, pp. 3-40.

Buckley Peter J. and Mark Casson. 1976. *The Economic Theory of the Multinational Enterprise.* Macmillan. London.

Burke, James, *Connections* London, Macmillian, 1978.

Caves, Richard, 1971, "International Corporations: The Industrial Economics of Foreign Investment," *Economica*, Vol. 38, February, pp. 1-27.

Caves, Richard, 1986, *Multinational Enterprise and Economic Activity*, Cambridge University Press.

Coase, Ronald H., 1937. "The nature of the Firm," *Economica* Vol. 4, Nov. pp. 386-405.

Christophe, Stephen. 1997. "Hysteresis and the value of the US Multinational Corporation" *Journal of Business*, Vol. 70 no. 3, pp. 435-462.

Daley, Lane, Vikas Mehrotra and Ranjini Sivakumar. 1997. Corporate focus and value creation:

Evidence from spin-offs. *Journal of Financial Economics*. Vol. 45, pp. 257-281.

Demetz, Harold, 1988, "The Theory of the Firm Revisited," in Ch. 9, *Ownership Control and the Firm: the Organization of Economic Activity, Vol. 1*, Cambridge: Mass, Basil Blackwell Ltd. (1990 paper back edition)

Denis, David J. Denis, Diane K. Sarin, Atulya. 1997 Agency problems, equity ownership, and corporate diversification. *Journal of Finance* Mar, Vol. 52 No. 1, pp. 135-16.

Dunning, John, 1977, "Trade, Location of Economic Activity and the MNE: a Search for an Eclectic Approach." in B. Ohlin, P.-O. Hesselborn, and P. M. Wijkman (eds.), *The International Allocation of Economic Activity: Proceedings of a Nobel Symposium Held at Stockholm*, pp. 395-418. London: Macmillan.

Gertner, Robert H., David Scharfstein, and Jeremy C. Stein, 1994, "Internal versus external capital markets," *Quarterly Journal of Economics*. Vol. 109 no. 4. Nov, pp. 1211-1230.

Hall, Bronwyn H. 1988, "The Manufacturing Sector Master File" Palo Alto N.B.E.R. technical paper, Stanford.

Hall, Bronwyn H., 1993, "The Stock Market*s Valuation of R&D Investment During the 1980*s," *American Economic Review*, Vol. 83, No. 2, May, pp. 259-264.

Harris, David, Randall Morck, Joel Slemrod and Bernard Yeung. 1993. "Income Shifting in US Multinational Corporations" in Alberto Giovannini, Glen Hubbard and Joel Slemrod, eds. *Studies in International Taxation*. University of Chicago Press.

Harris, Mary Stanford, "Economic Factors Affecting Managers' Business Segment Reporting Choices," unpublished manuscript Pennsylvania State University, 1995.

Harris, Robert S. and Zechner, Josef. 1991. The Role of Acquisitions in Foreign Direct Investment: Evidence from the U.S. Stock Market. *Journal of Finance* July, Vol. 46 no. 3, pp. 825-844

Hayes, Rachel M. and Russell Lundholm, "Segment Reporting to the Capital Market in the Presence of

a Competitor", *Journal of Accounting Research*, 1997 34 pp. 261-279.

Helpman, Elhanan 1984, "A Simple Theory of International Trade with Multinational Corporations" *Journal of Political Economy*, 92, June, pp. 451-471.

Hubbard, R. Glenn and Darius Palia, 1997, "A Re-examination of the Conglomerate Merger Wave in the 1960s: an Internal Capital Markets View," Columbia University.

Jacob, John. 1996. " Taxes and transfer pricing : Income shifting and the volume of intrafirm transfers" *Journal of Accounting Research* Autumn, Vol. 34 no. 2, pp. 301-312

Jensen, Michael C., 1989, "Eclipse of the Public Corporation," *Harvard Business Review*. Vol. 67 no. 5. Sep/Oct pp. 61-74

Jensen, Michael C. 1986, "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review*; Vol. 76 no. 2 May, pp. 323-29.

John, Kose and Eli Ofek, 1995, "Asset sales and increase in focus" *Journal of Financial Economics,* Jan 1995, Vol. 37 no. 1, pp. 105-126.

Kang, Jun-Koo. 1993. The international market for corporate control : Mergers and acquisitions of U.S. firms by Japanese firms. *Journal of Financial Economics*, Dec, Vol. 34 no. 3, pp. 345-371.

Khanna, Tarun and Krishna Palepu. 1997. "Why focused strategies may be wrong for emerging markets." *Harvard Business Review,* Jul/Aug, Vol. 75 no. 4, pp. 41-51.

Kogut, Bruce, and U. Zander, 1992. "Knowledge of the Firm, Combinative Capabilities and the Replication of Technology," Organization Science, vol. 3, pp. 383-397.

Lang, Larry H. P., and Rene M. Stulz, 1994, "Tobin*s q, Corporate Diversification, and Firm Performance," *Journal of Political Economy*, Vol. 102, No. 6, pp. 1248-128.

LeBaron, Dean, and Lawrence S. Speidell, 1987, "Why Are the Parts Worth More than the Sum? 'Chop Shop,' a Corporate Valuation Model," in *The Merger Boom*, edited by Lynn E. Browne and Eric S. Rosengren. Conference Series, no. 31. Boston: Fed. Reserve Bank.

Linderberg, Eric B., and Stephen Ross, 1981, "Tobin*s q Ratio and Industrial Organization," *Journal of Business*, Vol. 54 Jan. pp. 1-32.

Livermore, Shaw. 1935 "The Success of Industrial Mergers" *Quarterly Journal of Economics*, May, pp. 68-96.

Manzon, Gil B Jr. Sharp, David J. Travlos, Nickolaos G. 1994. An empirical study of the consequences of U.S. tax rules for international acquisitions by U.S. firms. *Journal of Finance* Dec, Vol. 49 no. 5, pp. 1893-1904.

Martin, Kenneth J. McConnell, John J. 1991. Corporate Performance, Corporate Takeovers, and Management Turnover. *Journal of Finance* June, Vol. 46 no. 2, pp. 671-687

Matsusaka, John, G. 1997, "Corporate Diversification, Value Maximization, and Organizational Capabilities," University of Southern California.

Matsusaka, John G. 1993a. "Takeover motives during the conglomerate merger wave." *Rand Journal of Economics* Autumn, Vol. 24 no. 3, pp. 357-379.

Matsusaka, John G. 1993b. "Target profits and managerial discipline during the conglomerate merger wave." *Journal of Industrial Economics* Jun, Vol. 41 no. 2, pp. 179-189.

Mikkelson, Wayne H. and Partch, M. Megan. 1997. "The decline of takeovers and disciplinary managerial turnover" *Journal of Financial Economics* May 1997, v44n2, pp. 205-228.

Mitchell, Mark L. and Lehn, Kenneth. 1990. Do Bad Bidders Become Good Targets? *Journal of Political Economy* . 98(2) 372-398.

Mitchell, Will, Randall Morck, Myles Shaver, and Bernard Yeung, "Causality between International Expansion and Investment in Intangibles, with Implications for Financial Performance and Firm Survival," with in *Global Competition and Market Entry Strategies*, J-F Hennert (ed.), Elsevier, North-Holland, forthcoming, 1998.

Montgomery, Cythnia, 1994, "Corporate Diversification," *Journal of Economic Perspectives*, Summer, Vol. 8 No. 3, pp. 163-178.

Morck, Randall, and Bernard Yeung, 1991, "Why Investors Value Multinationality," *Journal of Business*, Vol. 64, no. 2, pp. 165-187.

Morck, Randall, and Bernard Yeung, 1992, "Internalization: an event study test," *Journal of International Economics*, Vol. 33, pp. 41-56.

Morck, Randall, Andrei Shleifer and Robert Vishny, 1990 "Do Managerial Objectives Drive bad Acquisitions" *Journal of Finance*, 45(1), March, pp. 31-48.

Myers, Stewart C.; and Majluf, Nicholas S., 1984, "Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have," *Journal of Financial Economics*; Vol. 13 no. 2 June, pp. 187-221.

Pacter, Paul, "Reporting Disaggregated Information" *Financial Accounting Standards Board 123-A*, FASB 1993.

Palia, Darius, 1998, "Corporate Governance and the Diversification Discount," University of Chicago, mimeo.

Prahalad, C K, 1998, "Growth Strategies," *Executive Excellence*, Vol. 15 No. 1, Jan. pp.6-7.

Rajan, Raghu, Henri Servaes, and Luigi Zingales. 1997. "Conglomerate Discount and Inefficient Investment." University of Chicago working paper.

Rugman, Alan M., 1980, "Internalization as a General theory of Foreign Direct Investment," Weltwirtschaftliches Archiv, Jun, pp. 365-379.

Rumelt, Richard P. 1982, "Diversification Strategy and Profitability," *Strategic Management Journal,* Vol. 3 No. 4. October, pp. 359-369.

Romer, Paul M., 1996, "Increasing Returns and Long Run Growth," *Journal of Political Economy*, Oct., pp. 1002-1037.

Scharfstein, David. And J. Stein, 1998, "The Dark Side of Internal Capital Markets: Divisional Rent-seeking and Inefficient Investment," MIT working paper.

Scharfstein, David, 1997. "The Dark Side of Internal Capital Markets II." MIT working paper.

Schipper, Katherine and Rex Thompson, 1983, "Evidence on the Capitalized Value of Merger Activity for Acquiring Firms," *Journal of Financial Economics*, April 1983, Vol. 11, pp. 85-119.

Servaes, Henri. 1996. "The Value of Diversification During the Conglomerate Merger Wave." University of North Carolina working paper. *Journal of Finance*, Sept, 51(4), pp. 1201-1225.

Shih, Michael S H. Corporate tax incentives for conglomerate mergers: Model development and empirical evidence. *Contemporary Accounting Research* Spring 1994, Vol. 10 no. 2, pp. 453-481.

Shin Hyun-Han and René M. Stulz. 1997. "Are Internal Capital Markets Efficient?" Ohio State University working paper.

Singh, Harbir and Montgomery, Cynthia A. 1987, "Corporate Acquisition Strategies and Economic Performance," *Strategic Management Journal*. Vol. 8 no. 4. (Jul/Aug) pp. 377-386.

Stein, Jeremy C. "Internal capital markets and the competition for corporate resources." *Journal of Finance* Mar 1997, Vol. 52 no. 1, pp. 111-133.

Teece, David, J., G. Pisano and A. Shuen, 1997. "Dynamic Capabilities and Strategic Management," *Strategic Management Journal*, Vol. 18, forthcoming.

Tobin, James. and William Brainard, 1977. "Asset markets and the Cost of Capital" in *Economic Progress, Private Values and Public Policy: Essays in Honor of William Fellner*. ed. R. Nelson and B. Balassa. Amsterdam, North Holland

White, H. 1980, "A Heteroskedasticity-consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity," Econometrica, Vol. 48 (May) pp. 817-38.