Internal Capital Markets: Benefits, Costs, and Organizational Arrangements

Julia Porter Liebeskind
Marshall School of Business, University of Southern California, Los Angeles, California 90089-1421, liebesk@rcf.usc.edu

Abstract

Diversification not only internalizes transactions of goods and services, but it also internalizes transactions of capital. Hence, the value of diversification will depend, inter alia, on whether internal capital markets are relatively efficient or inefficient. This essay reviews and discusses the possible benefits and costs of internal capital markets by conducting a careful comparative institutional analysis. The essay concludes that internal capital markets can add value to lines of business only under a limited number of circumstances. Some recent developments in the organization of internal capital markets in diversified firms can be understood as attempts to increase their efficiency.
(*Diversification*; *Internal Capital Markets*)

Introduction

One of the central and enduring research questions in corporate strategy is: How can diversification create value? It is now widely accepted that diversification can extend the use of valuable firm-specific resources and capabilities that are costly to trade through markets. Diversification may also increase market power and reduce bankruptcy risk. Yet these benefits may never be realized, if diversification also incurs costs that are not incurred in focused firms. Internal capital markets may be a source of such costs.

Williamson (1975) was the first to note that diversification fundamentally transforms the organizational arrangements that govern capital allocation by internalizing functions that otherwise are carried out by banks and other financial intermediaries. He argued that "internal capital markets" in diversified firms can allocate capital more efficiently than external capital markets can, and that they can reduce wasteful investment at lower cost. Myers and Majluf (1984) and Stein (1997) have also argued that capital allocation is more efficient in internal capital markets, due to information asymmetries, while Henderson (1970, 1979) has argued that internal capital markets prevent businesses from being irrationally starved of capital due to cyclicalities and investment fads, which he asserts characterize external capital markets.

Taken together, these arguments suggest that internal capital markets may increase the value of diversified firms relative to focused firms. However, recent research by Berger and Ofek (1995), Scharfstein (1997), Shin and Stulz (1998), and Schlingemann et al. (1999) suggests that internal capital markets can result in more over- and underinvestment than external capital markets. Others have argued that biases, standards, and stickiness in bureaucratic resource allocation rules within diversified firms also result in misallocation of capital (Bhide 1990, Glassman 1995). Meanwhile, Jensen (1986, 1993) and Scharfstein and Stein (1999) have argued that internal capital markets attenuate the incentives of business-level and corporate managers to invest capital efficiently. These arguments and findings suggest that any benefits of internal capital markets may be more than offset by their costs.

The question of whether internal capital markets create or destroy firm value is critical to developing theories about the value of diversification. If internal capital markets yield net benefits, then ceteris paribus, diversification should create value regardless of whether it generates other benefits. If internal capital markets incur costs, diversification may destroy value even when other benefits can be earned. Finally, if the costs or benefits of internal capital markets are negligible, diversification must perforce reap other benefits to create value. This latter situation is the one that is assumed in much extant theory, but this assumption may be erroneous, at least under some circumstances.

In this essay, I seek to resolve at least some of the debate about the relative efficiency of internal capital markets by providing a comprehensive consideration of the arguments presented by others, and by adding some

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critical analysis of my own. I start my review by illustrating that internalization of a line of business into a diversified firm produces two important changes in the governance of its capital flows: *changes in the type of provider of capital* to that business, and *centralization of the investment decisions* made for that business. Most existing analyses ignore either one or the other of these effects. I then consider how these changes in governance may influence the three broad classes of efficiency gains that previous authors have attributed to internal capital markets. These classes are:

(i) Improvements in lender information (Williamson 1975, Myers and Majluf 1984, Stein 1997);

(ii) Improvements in the reliability of capital supply (Henderson 1970, 1979); and

(iii) Reduction in agency costs (Williamson 1975).

The first conclusion of this essay is that internal capital markets cannot be argued to be either uniformly beneficial or uniformly costly. Rather, there are important contingencies that influence their relative efficiency. For instance, it is important to consider whether a line of business is *capital-constrained;* this essay suggests that this is essential for earning benefits from internalization. There are other important contingencies that also bear on comparative efficiency.

The second conclusion of this essay is that the comparative benefits and/or costs of an internal capital market can be nontrivial. Hence, the value of a diversified firm can be significantly influenced by the efficiency or inefficiency of its internal capital market. This conclusion calls for a more integrated treatment of the capital economy and the real economy of diversified firms in future theory building and empirical research.

A third conclusion made here is that the relative efficiency of an internal capital market can depend on its organization. Indeed, many diversified firms have adopted specialized organizational arrangements that can be understood as attempts to improve the comparative efficiency of their internal capital markets, some of which I describe. This suggests that the organization of internal capital markets should also receive more attention in future research.

Internal and External Capital Markets

Firms and Capital

The theory of the firm (Coase 1937) states that firms exist because they are able to govern certain types of transactions more efficiently than markets. Since Coase, other researchers have provided important refinements and extensions of this theory (see, for example, Klein et al. 1978, and Grossman and Hart 1986). Yet the theory of the firm today remains centered on the firm's role in administering exchanges of real goods and services; the financial transactions of the firm are not considered determinants of a firm's boundaries.[1]

This omission may have far-reaching consequences, because in the system of property rights that comprises the modern corporation, the rights of managers to coordinate and use the real property of the firm—the rights that are argued to underpin the efficiency of the firm as a governance institution—are bundled with managerial rights to allocate the capital flows associated with the use of that real property (Barzel 1989). Hence, under corporation law, the real goods economy of the firm and its capital economy are inextricably intertwined. The implication of this combination of rights is that (following transaction cost reasoning) a firm will be more efficient than a market if and only if it is able to administer the sum of its transactions, both of real factors and of capital, more efficiently than the relevant markets could administer that bundle of transactions. Therefore it is just as important to compare the efficiency of markets and hierarchies in administering transactions of capital as it is to compare their efficiency in administering noncapital transactions.[2] This issue becomes all the more important in light of the fact that internal capital markets play an enormously important role in the U.S. economy, in which private production is dominated by large diversified firms (Bettis and Prahalad 1983, Montgomery 1994).

Institutional Characteristics of External and Internal Capital Markets

The "external capital market" comprises institutions that administer stocks and flows of capital but do not produce or trade real goods and services. In developed economies, these institutions include retail banks, investment banks, pension funds, brokerage houses, mortgage providers, and insurance firms, which are known collectively as "intermediary financial institutions" or "IFIs."[3] These IFIs borrow capital from investors at large and lend it to governments, firms, and individual consumers in exchange for financial claims such as equity or debt. These claims are then traded through a series of regulated markets (such as the New York Stock Exchange) where they are priced by numerous buyers and sellers—hence, capital *markets.* These markets for capital are called "external" because IFIs are separate from firms that borrow capital to finance production.

All firms may use the services of external capital markets. However, diversified firms also administer an "internal capital market" wherein cash flows from one line of business may be used to fund investments in another

line of business. In this case, the Corporate Headquarters (CHQ) becomes the effective lender at the line of business level. Even if capital is not reallocated within a diversified firm, the CHQ will necessarily monitor sources and uses of capital at the line of business level, thereby substituting internal monitoring of capital stocks and flows for that of external lenders such as banks and shareholders for those businesses.

Comparing Internal and External Capital Markets

In this essay, I use a series of comparative institutional analyses to examine the relative efficiency of internal and external capital markets. The primary unit of these analyses is a single line of business. This line of business can be organized as either a free-standing, focused firm (see Figure 1(a)), or can be internalized within a diversified firm (see Figure 1(b)). Using this approach, it can be seen that, *from the point of view of any given line of business,* external and internal capital markets are substitutes. Also following Figure 1, internalizing a line of business within a diversified firm can be understood to have two effects on the governance of capital allocations decisions for that business, as follows:

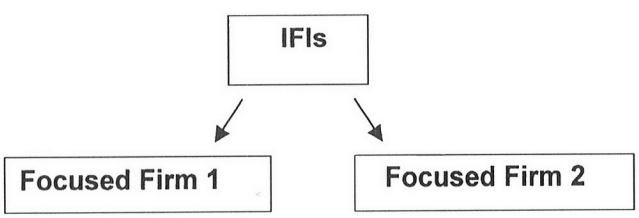
1. The Lender-Type Effect. Internalizing a line of business within a diversified firm changes the *type of organization* that provides capital to that business. A focused firm in need of capital will seek that capital from an IFI. In a diversified firm, a line of business must seek capital from the CHQ. Even if the CHQ must itself borrow capital from IFIs, from the point of view of the line of business, the CHQ is still the provider. This change in lender type may have economically important effects. For instance, one type of capital provider may have more information than another about the value of a particular investment, or it may be able to supply capital more reliably when needed.

2. The Centralization Effect. Internalization of a line of business within a diversified firm also *shifts the locus of capital allocation decisions that do not involve borrowing.* In a focused firm, ongoing investment decisions that do not involve borrowing are made by the firm's own management. In a diversified firm, the CHQ makes capital allocation decisions regardless of whether the line of business is capital-sufficient or not; lines of business in a diversified firm do not retain their own cash flows for reinvestment purposes, as they would if they were organized as a focused firm. Thus, internalization results in a centralization of investment decisions, relative to a focused firm.[4]

Note that, for both these effects, the capital sufficiency of a line of business is a critical contingency, as illustrated in Table 1. When a line of business is capital-constrained—that is, the business cannot finance all its positively valued investments from its own cash flows and capital reserves—it must seek capital from either an IFI (in a focused firm) or a CHQ (in a diversified firm). Hence, the Lender-Type Effect will always apply to a capital-constrained business. However, the Centralization Effect does not apply to a capital-constrained business because investment decisions for this type of business are inevitably centralized to either an IFI (in the focused firm) or a CHQ.

Figure 1 External and Internal Capital Markets

1(a). External Capital Markets: Lines of business are organized as free-standing focused firms that borrow from IFIs.



1(b) Internal Capital Markets: Lines of business are internalized within a diversified firm. All borrowing at the line of business level is governed by the CHQ.

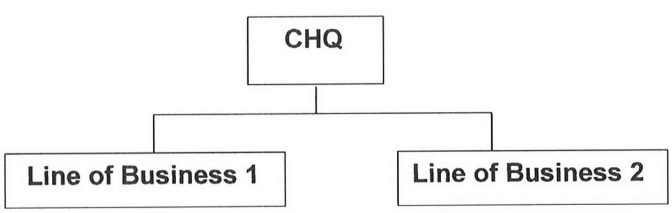


Table 1 Capital Sufficiency, Lender Type and Centralization

Line of Business is:	Line of Business is Organized as: A Focused Firm	Part of a Diversified Firm
1. Capital-Constrained	Firm seeks funds from IFIs: Lender Type Effect applies	Line of business seeks funds from the CHQ: Lender Type Effect applies
2. Capital-Sufficient	Firm funds own investments: No Lender Type Effect No Centralization Effect	Line of business must obtain funds from CHQ: Centralization Effect applies

If a line of business is capital sufficient—that is, the business can finance all its positively valued investments from its own cash flows and capital reserves—and it is organized as a focused firm, the firm's management directs and authorizes its investments. If this line of business is internalized into a diversified firm, however, the CHQ always has final authority over capital disbursement. Hence, when a capital-sufficient line of business is internalized, the Centralization Effect always applies.

A problem in the existing literature is that, typically, one or the other of these effects is ignored. For instance, Williamson (1975), Myers and Majluf (1984), and Stein (1997) consider only changes in lender type, arguing that CHQ managers are better informed to make capital allocation decisions than IFIs. These authors ignore the effects of centralizing capital allocation decisions on capital-sufficient businesses. Concomitantly, Jensen (1986, 1993) focuses his arguments on the costs of centralization in diversified firms, ignoring the possible benefits of change in lender type that may follow internalization of capital-constrained businesses.

Throughout this essay, I consider the economic consequences of both the Lender-Type Effect and the Centralization Effect by explicitly comparing the efficiency of the internal capital market of a diversified firm with the efficiency of an equivalent set of focused firms. All comparisons are ceteris paribus: I assume that the asset and cash flow characteristics of the various lines of business being considered are identical in diversified and focused firms; that managers' risk preferences in the diversified firms and the focused firms are identical; and that economies of scope between businesses are also identical. In short, only the institutional arrangements that govern the two sets of businesses are assumed to be different.

Information Completeness in Internal and External Capital Markets

The argument that CHQ managers in a diversified firm may have more complete information about the value of a given investment opportunity than an IFI was first proposed by Williamson:

> The [informational] advantages of the general office [CHQ of a diversified firm] over the [external] capital market. . . . are of two kinds. First, division managers are subordinates; as such, both their accounting records and backup files are appropriate subjects for review. Stockholders, by contrast, are much more limited in what they can demand by way of disclosure. . . . .
>
> Second, the general office can expect knowledgeable parties to be much more cooperative than can an outsider. . . . Disclosure of information to outsiders commonly exposes the informant to penalties. . . . (Williamson 1975, pp. 146–147).

The implication here is that, because CHQ managers have more complete information, CHQs should more frequently avoid investing in bad projects (i.e., making Type II investment errors) and/or more frequently identify good projects (i.e., avoid making Type I investment errors). By making fewer investment errors, CHQ managers improve the productivity of capital, effectively reducing its cost to any given investment. Similar arguments have been put forward by Myers and Majluf (1984) and Stein (1997).

Evidence on information asymmetry in internal and external capital markets is mixed. Empirical evidence does show that investment rates in many firms are sensitive to cash flow or cash stocks. One explanation of this phenomenon is that firms are capital-constrained due to information asymmetries in external capital markets. Otherwise, it is argued, firms should not reduce their investment when cash flow or cash stocks decline, but should obtain outside financing to maintain investment levels. (See, for example, Fazzari et al. 1988, Gertler and Gilchrist 1994). However, there are alternative explanations for the sensitivity of investment rates to cash flow or stocks. For instance, inward investment levels may be highly correlated with cash flow because cash flow is an accurate indicator of the value of future investments. Hence, declines in current cash flow may signal a permanent decline in the value of a firm's future investment options (see Kaplan and Zingales 1995). Furthermore, other empirical evidence on investment rates and financing structures is inconsistent with the argument that there is information asymmetry between firms and IFIs.[5] Given that there is apparently no consensus on this issue, it would be useful to consider the circumstances under which information completeness may be greater in internal capital markets than external capital markets, and vice versa.

There are two factors that may differentially impact information completeness in internal and external capital markets. These are:

(a) access to firm-specific information in internal and external capital markets; and

(b) the degree of lender specialization in internal and external capital markets.

Below, I discuss these two factors in relation to the Lender-Type Effect (to which existing information completeness arguments largely refer), and in relation to the Centralization Effect (which existing arguments by and large ignore).

Information Completeness when Lines of Business Are Capital-Constrained: The Lender-Type Effect

1. Lender Type, Information Access, and Information Completeness. The essence of Williamson's argument—illustrated in the quotation given earlier—is that

CHQ managers in diversified firms are able to gain access to information about a given line of business that outside investors lending to a focused firm would not be able to obtain. His comparison is therefore between a CHQ and an IFI as a lender of capital and as a monitor of performance.

According to the laws governing public corporations, managers are not required to make all the information they possess available to outside investors. The motivation for this arrangement is protection of trade secrets: managers may possess information such as proprietary market research, detailed strategic and operating plans, and knowledge about valuable future firm-specific investment opportunities that needs to be protected from competitors (Cheung 1982). If managers were required to reveal all proprietary information to investors, rival firms could obtain complete details of a firm's trade secrets merely by purchasing shares or debt. In diversified firms, managers also possess accounting information about the performance of individual lines of business of the firm that they are not required to reveal to outside investors, except on a very limited basis.[6] Therefore, consistent with Williamson's (1975) argument, the CHQ of a diversified firm certainly has access to information about the lines of business of that firm that would not be de facto available to an IFI, were those lines of business organized as focused firms.[7]

Whether or not this legal provision results in actual and consistent differences in information completeness between firms and IFIs, however, is a more complex question. While managers are not obliged to reveal information to outside parties, they may nonetheless reveal such information to IFIs because, without relatively complete information, an IFI will charge a firm an interest rate premium to compensate for its increased uncertainty about repayment (Merton 1995). An IFI may also withhold capital if uncertainty is high. Concomitantly, most IFIs have high-powered incentives to protect any information managers reveal. For instance, a banker who reveals the details of one firm's business to another can be sued for breach of confidentiality. Equity investors who reveal valuable confidential information about a firm will undermine the value of their shares by facilitating imitation by competitors. Revealing proprietary information may also constitute securities fraud and/or a breach of trade secrets laws.

Nonetheless, there are risks of leakage of valuable information in external capital markets. For instance, Werth (1995) describes a dilemma faced by a new drug firm, Vertex, as it sought capital from outside lenders. One of these lenders—the venture capitalist Ken Kinsella—was of particular concern to the managers at Vertex, who feared that Kinsella would use information obtained from Vertex to set up other new firms in closely competing product areas. If Vertex had been a line of business of a large, diversified firm, and if Kinsella were a corporate manager, he could have been bound by contract not to reveal Vertex's trade secrets, a contract that cannot be perfectly replicated when parties are not employees (Liebeskind 1997). Hence, it is possible that there are circumstances when an internal capital market will be able to protect valuable information about an investment more effectively than an external capital market. Note, however, that these circumstances concern the costs of leakage of information, not the feasibility or cost of information access.

2. Lender Type, Lender Specialization, and Information Completeness. A second factor to consider in relation to information completeness in internal and external capital markets is lender specialization. Even if a firm fully reveals all relevant information about a given investment to an IFI or a CHQ, either lender will make fewer investment errors, when it is more knowledgeable about a given business. Both IFIs and CHQs are only boundedly rational (Kaldor 1934, Simon 1976). Consequently, the more specialized a lender is, the more knowledge it can accumulate about a given business, and the more efficient a lender it will be. Williamson (1975) characterizes this situation as a tradeoff of breadth (in external capital markets) for depth (in internal capital markets). However, some caution is warranted in making this characterization.

One reason that Williamson's characterization may be invalid is that IFIs are not necessarily "broad" lenders. Indeed, there are many types of highly specialized IFIs. For example, there are industry-specialized IFIs, such as high-technology venture capital firms; auto-leasing specialists; factors (that finance inventory in the clothing industry); crop-financing institutions; asset securitization firms (that lend against specific tangible assets such as airframes or earth-moving equipment); "angels" (lenders who finance theatrical productions); and individual investors who have specialized industry information. There are also firm-specialized IFIs who maintain a long-lived lending relationship with a single firm or a small group of firms. These include large individual investors (such as Warren Buffet, Paul Allen, and Carl Icahn, all of whom invest on behalf of other parties as well as on their own account) and investment trusts (such as the Hershey Trust). A bank may also have a long-term lending relationship with a firm. While the practice of "exclusive banking" has become rare in the United States (Lamoreaux 1994), it is still common in Germany and Japan.[8] However, not all firms or industries are served by

specialized IFIs; some firms must resort to generalized lenders. And even though these institutions have specialists on their staff (e.g., analysts) that lend to specific industries or firms, final lending authority will rest on a management whose information will necessarily be broad rather than deep, as Williamson (1975) suggests.

A second reason to be cautious about unconditionally adopting Williamson's "breadth for depth" characterization is that the CHQ of a diversified firm—while it is by definition a firm-specialized lender—is not an industry-specialized lender. Conglomerates in particular comprise widely diverse businesses. Even in "related-diversified" firms, industry conditions may vary widely, though businesses share assets, resources, or capabilities. Hence, from the point of view of a specific line of business, the relevant question is—who is the more informed lender? Is the more informed lender a CHQ? Or is it a lender in the external capital market? This discussion suggests that the answer to this question will be highly specific to a given line of business. For some lines of business—those served by specialized IFIs—borrowing from the external capital market may be more informationally efficient. For other lines of business—those that are not served by specialized IFIs—an internal capital market may be more informationally efficient, especially if the firm is not highly diversified.

One factor that may favor a CHQ in this comparison is access to tacit knowledge: the management of a diversified firm may be able to obtain valuable but uncoded knowledge through their active management of the firm's assets. This knowledge, because uncoded, cannot in principle be obtained by an IFI. Some caution is warranted in making this point too strongly, however. CHQ managers in diversified firms cannot be actively involved in the management of more than a very small number of businesses without violating the bounded rationality constraint (Kaldor 1934).[9] Meanwhile, some IFIs are involved in active management of new firms. For instance, Burke (1995) describes how many venture capitalists are actively involved in the management of the firms in which they invest. Large shareholders are also frequently actively involved in corporate management (Holderness and Sheehan 1985). Hence, tacit knowledge is neither exclusively available to CHQ management, nor necessarily accessed by CHQ management.[10]

An additional consideration here is that experience can also increase information completeness. If there is no variance in investment returns in a given industry, a firm or an IFI needs to make only one investment to discover the given return. However, investment returns are typically drawn from an ex ante unknown distribution of returns, so that additional investments reveal more information. In this situation, if all realized investment returns in an industry are common knowledge, both a CHQ and an IFI can observe their own returns and those of other lenders, and there will be no difference in their information for any given number of investments. However, if lenders have more information about investment returns than nonlenders, the information completeness of a CHQ or an IFI will depend on the number of investments it makes. Consequently, the CHQ of an established firm with a large market share may have more experience investing in a particular industry than an IFI, giving that CHQ an informational advantage in investing in that industry. Similarly, an IFI with established lending in a given industry will have more experience than a diversified firm that is entering that industry for the first time; in this latter case, the information advantage rests with the IFI. Obviously, sudden changes in industry conditions can eliminate the experience-based informational advantage of either type of lender.

A final factor that may influence the relative information completeness of a CHQ or an IFI is the specificity of an investment, as illustrated in Table 2. The table shows two categories of investment specificity: industry specificity and firm specificity. An "industry-specific" investment is an investment that occurs only in a given industry, but is generic to many firms in that industry. For instance, airframes are an investment that is specific to the air transportation industry, but all firms in the industry invest in similar airframes. In contrast, office buildings

Table 2 Investment Type and Information Completeness

Industry-Specificity of Investment:	Firm-Specificity of Investment: High	Firm-Specificity of Investment: Low
High	Null set[(a)]	Industry-specific assets: Most efficiently financed by industry-specialized lenders or by industry experienced firms.
Low	Firm-specific but not industry-specific assets: Most efficiently financed by CHQs or by firm-specialized lenders.	Generalized assets: Most efficiently financed by most experienced lender.

Note. [(a)]An asset which is firm-specific cannot by definition be owned by more than one firm in an industry and hence, cannot also be industry-specific.

are not an industry-specific investment, but are used by firms in all industries. A "firm-specific" investment is an investment that is unique to a given firm regardless of industry, such as a brand name or a proprietary technology.

Based on the discussion in this section, Table 2 suggests the following conclusions:

(i) If an investment is in a firm-specific asset, the CHQ will tend to have more complete information than any IFI, with the possible exception of a firm-specialized lender. This is because only the CHQ will have lending experience for an investment of this type.

(ii) If an investment is in an industry-specific asset, it is likely that an industry-specialized IFI will have more complete information than a CHQ unless the firm in question is a highly experienced lender (i.e., it has a large market share). This is because the industry-specialized IFI will tend to have more knowledge (due to bounded rationality) and/or more investment experience than the CHQ.

(iii) If an investment is in a generalized asset, it is unlikely that the CHQ of a diversified firm will have any more information about that investment than a generalized IFI.

Note, however, that these considerations apply only to certain types of investments. Yet, within a firm, different types of investments are inevitably bundled together, because the legal and control boundaries of a firm refer to all its activities, unless otherwise differentiated. Hence, within a diversified firm, *investment decisions for which the CHQ has more information than other lenders will tend to be bundled together with investment decisions for which the CHQ has less information than other lenders.* While investments will also be bundled within a focused firm, the focused firm can choose from a menu of lenders (IFIs) to identify the IFI that has the most efficient (cost-minimizing) level of information for a particular investment. In an internal capital market, however, a line of business must borrow from the CHQ—which is always the primary lender for that business. Lines of business do not have discretion to seek out other lenders. This "bundling problem" may be an important source of costs to internalized lines of business that are capital-constrained.

Information Completeness when Lines of Business Are Capital-Sufficient: The Centralization Effect

Before examining the effects of centralization on information access and lender specialization, it should be noted that centralization, in and of itself, imposes costs on a capital-sufficient line of business—the costs of the CHQ's administration of financial transactions. Recall that when lines of business are capital-sufficient, the relevant comparison is between the CHQ of a diversified firm and the management of a focused firm. If a capital-sufficient line of business were organized as a focused firm, it would bear no costs of CHQ administration of its financial transactions. Hence, these costs are an additional burden on a capital-sufficient business that is internalized in a diversified firm. They include the allocable costs of the CHQ building and allocable CHQ personnel costs (including allocable shares of the salaries of the CEO, CFO, Treasurer, and other corporate officers); the costs of preparing additional accounting and planning documentation for informing CHQ capital allocation decisions; the costs of underinvestment stemming from the need to control agency costs at the divisional level (Antle and Eppen 1985, Holmstrom and Ricart I Costa 1986, Harris and Raviv 1995, Scharfstein and Stein 1999); and the costs of delay in investment decision making. These costs are far from negligible. For instance, delays can be very costly for investments, such as new product development programs, whose value depreciates rapidly (Eisenhardt 1989, Kulatilaka and Perotti 1994). For example, Vesey (1991) cites a McKinsey study showing that a delay of six months in bringing a new product to market, relative to the first mover, results in a one-third drop in profits. Delays in multistage investments can also increase production costs by reducing economies of scale or scope (Rich and Dews 1986).

In addition to these direct costs of centralization, internalization also results in what Shin and Stulz (1998) call "stickiness" in the bureaucratic rules governing capital allocation in diversified firms. They find evidence that the CHQs of diversified firms tend to impose proportional borrowing rules on lines of business, which allow each business to borrow investment capital in proportion to its assets or cash flows, relative to the size of the other businesses of the firm. (For instance, a line of business that accounted for 15% of a firm's revenues would be allocated only 15% of its total investment funds in any given year, regardless of its relative profitability.) These rules are carried over from year to year, so that when the cash flows of some lines of business of a diversified firm decline, investment in other lines of business is reduced, regardless of their relative profitability. The net effect of this stickiness is to promote both underinvestment in some businesses and overinvestment in other businesses. Berger and Ofek (1995) also identify inefficient cross-subsidization between lines of business as an important cause of underperformance in diversified firms. Lamont (1997) finds similar evidence.

Because there are significant administrative costs associated with centralization, any improvements in lenders' information completeness that centralization could achieve would need to be sufficiently large to offset these

costs. Yet, established economic theory clearly indicates that centralization can be expected to reduce information completeness.

1. Centralization, Information Access, and Information Completeness. Centralization has no impact on information access per se when a line of business is not capital-constrained because the CHQ of a diversified firm and the management of a focused firm have the same statutory right to obtain information about the businesses that they operate.

2. Centralization, Lender Specialization, and Information Completeness. One reason centralization can reduce information completeness is bounded rationality: the amount of information that can be absorbed by management about a given line of business will decrease as the number of lines of business increases. Hence, ceteris paribus, the management of a focused firm can be expected to have more complete information than the CHQ of a diversified firm. However, as discussed in the previous section, the information completeness of a CHQ relative to a focused firm's management will also depend on the nature of the investment and relative lending experience. For instance, while the management of a focused firm may have more complete information regarding an industry-specific investment, a CHQ may have more complete information when investing in firm-specific assets for which it is an experienced lender.

A second cost of centralization stems from the nature of information used by managers in making investment decisions. In a focused firm, managers have two sources of information to inform their capital allocation decisions—bureaucratic measures of performance (such as accounting returns) and market measures of performance (the value of the firm's equities and publicly held debt). Because a public firm's claims are freely traded, their market prices indicate investors' expectations about the future value of the firm relative to all other investment options in the economy at large (Alchian and Demsetz 1972, Allen 1993).[11] However, when a line of business is internalized within a diversified firm, its market value cannot be perfectly unbundled from the values of the firm's other lines of business (Merton 1995). Hence, CHQ managers must rely on accounting values alone to inform their investment decisions. If a firm is in a stable environment, it is possible for these values to approach true value.[12] Otherwise, accounting numbers and market values will tend to diverge. This is because in markets the opinions of many de facto buyers and sellers are pooled (Allen 1993). Accounting values instead are estimated by a few individuals who are not de facto buyers and sellers, so that important factors that may affect future values may be overlooked. For instance, accounting numbers may fail to account for economically important intangible assets (Perfect and Wiles 1992) and hidden costs such as those of potential tort liability. In markets, biases such as these tend to be reflected in prices because, if not, they will create arbitrage opportunities. Investors who can identify "value gaps" between estimated and true values can earn rents from buying undervalued (or short selling overvalued) assets, and the market price of these assets will eventually rise (or sink) to the appropriate level.

An additional problem with relying on accounting values in internal capital markets is that, within diversified firms, accounting procedures (such as measures of profit and transfer prices) tend to be standardized across different lines of business (Bromiley 1986, Taggart 1987). The benefits of this standardization include reducing monitoring costs, economizing on bounded rationality, reducing influence activity, and ensuring equity in profit-based incentive schemes. However, while internalization may engender standardization, accounting standards can result in inefficient investment, if they do not reveal underlying values.

Finally, internal capital markets suffer from a relatively inefficient resource allocation decision process. In markets, resource allocation is based on an auction process in which true reservation values of investments will be revealed. Inside firms, resource allocation decisions are made through a capital budgeting process which is subject to manipulation and influence (Bower 1970, Schiff and Lewin 1970, Milgrom and Roberts 1992).[13]

All these considerations are consistent with established economic arguments to the effect that, ceteris paribus, centralization of investment decisions within a diversified firm will result in inefficiencies, relative to decentralizing investment decisions in a series of focused firms.[14]

Summary

The discussion in this section has shown that internalizing capital market functions does not necessarily create value by increasing information completeness about investment opportunities. Nonetheless, internal capital markets may be particularly efficient at allocating capital when:

(A) *A line of business is capital-constrained;* and

(B) Either:

(B.1) *A firm possess valuable proprietary information that may be appropriated by an external lender.* If borrowers have valuable trade secrets, financing investments internally can add value by saving the costs of misappropriation of valuable information. Internalization may be particularly valuable when proprietary technologies are shared between lines of business, and where intellectual property protections are weak (Teece 1986); and/or

(B.2) *Investments are industry specialized, and there is*

a lack of industry-specialized lending institutions. For example, it is widely recognized that emerging economies suffer from a lack of well-informed lending institutions (King and Levine 1993). This factor may account for the prominence of large, diversified firms in the economies of many developing countries. Evidence on the performance of diversified firms in India provided by Khanna and Palepu (1996) is consistent with the argument that internal capital markets can add value when local external capital markets are poorly developed. Even in developed economies, IFIs are becoming more and more specialized over time, so that it is possible that IFIs are now better informed, compared with CHQs, than they were two or three decades ago (Bhide 1990). One factor here may be the growth of specialized lending to specific sectors of the economy such as aircraft (leasing firms), high technology (venture capital firms), and real estate development (dedicated partnerships). Such improvements in external lender information can be expected to have shifted certain lending functions from internal capital markets to external capital markets, with consequent impact on the scope of firms (Bhide 1990).

Where lines of business are capital-sufficient, it is unlikely that a CHQ will have more extensive and valuable information than the managers of a focused firm for the purpose of making investment decisions. Furthermore, centralization imposes nontrivial administration costs that are not borne by focused firms. Therefore, to the degree that the lines of business of a diversified firm are capital-constrained rather than capital-sufficient, the more likely it is that internalization of capital transactions will yield benefits. Concomitantly, to the degree that the lines of business of a diversified firm are capital-sufficient rather than capital-constrained, the more likely it is that internalization of capital transactions will incur costs stemming from lack of information completeness.

Organizational Solutions to Information Incompleteness in Internal Capital Markets

Recent writings on the organization of internal capital markets have recognized the problem of information incompleteness that obtains within large, diversified firms (Jensen and Meckling 1992, Glassman 1995). Some authors have suggested resolving this problem by decentralizing the internal capital allocation process, so that investment decision rights and valuable knowledge are colocated at the line of business level (Jensen and Meckling 1992, Bartlett and Ghoshal 1993). However, decentralizing authority for capital allocation within a diversified firm can result in "incoherent combinations" of businesses (Milgrom and Roberts 1992). At a minimum, some centralized coordination is required because sources and uses of capital must always be in balance; decentralization could result in excessive borrowing. Decentralized investment may also result in a firm's internalizing activities that have high negative spillover potential, such as lines of business with tort liability exposure (Barney et al. 1992, Bethel and Liebeskind 1998). Finally, decentralized investment regimes may distort managerial incentives in ways that impose costs on a firm as a whole (Holmstrom and Ricart I Costa 1986). Hence, while decentralization of investment decisions in a diversified firm may reduce investment errors per se, it may impose other significant costs on a firm.

There are, however, some alternative organizational arrangements that may alleviate problems of information incompleteness in diversified firms. These include partnered lending, prospective investing, and internal capital market specialization.

1. Partnered Lending. If a diversified firm has an investment option that the CHQ is insufficiently knowledgeable to invest in alone, it can seek out a more knowledgeable investment partner for that investment. Effectively, the diversified firm outsources lending services for some of its investments.

One example of a partnered lending arrangement is a joint venture wherein a diversified firm supplies capital while investment decisions are delegated to a better-informed venture partner. For instance, in the early stages of development of the biotechnology industry, large incumbent pharmaceutical firms lacked the knowledge necessary to make informed investments in exploiting this new technology. To overcome this problem, many incumbents entered into joint ventures and long-term contracts with new biotechnology firms (NBFs). In these arrangements, the pharmaceutical firms funded research programs in biotechnology that were administered by the more knowledgeable NBFs. Over time, as the established firms learned more about the technology, they shifted their investments to their internal capital markets, funding their own research programs and buying up new firms with promising technologies.

Another example of partnered lending is Research and Development Limited Partnerships. Here a firm will conduct research internally, but raise capital from specialized outside investors who monitor the project in return for a share of the investment profits.

Asset securitization can also be considered an example of partnered lending. In this arrangement, certain tangible assets of a firm are owned by a specialized IFI and leased back for use to a firm. Real asset securitization is a new and growing business (Kendall and Fishman 1996), so it is still somewhat limited in scope. However, it is well

established in certain areas, such as aircraft leasing, oil exploration, real estate, and utilities.

Despite these advantages, it should be noted that for partnered lending to succeed, the CHQ will need a minimum level of information in order to be able to identify those lending areas where it lacks expertise, and to identify highly informed external lenders. Otherwise, there is a risk of compounding the firm's information problems, rather than resolving them.

2. Prospective Investing. A second way in which a diversified firm can increase its information about investment returns in a given line of business is to invest relatively small amounts of its capital in a series of separate investments, in order to obtain more information about the range and determinants of investment returns. In this way, a firm can build its investment experience in a particular area. Again, the biotechnology industry provides an example. In the early stages of the industry, most incumbent pharmaceutical firms invested in a number of different biotechnology startups. By taking an equity stake and obtaining a seat on the board of these firms, the large firms could learn directly about investment prospects in the emerging technology. Similarly, many media firms today are investing in smaller "multimedia" startups.

3. Internal Specialization. A third solution to the information completeness problem is for a firm to establish a separate internal capital market that is specialized to specific classes of intrafirm investments. One example of such an organization is Xerox Technology Ventures (XTV), described by Hunt and Lerner (1995). Chastened by its failure to invest in the personal computer technology it was responsible for developing, Xerox set up XTV to lend capital to other new technologies it developed internally. As well as earmarking capital specifically for new technology investments, XTV allows Xerox to protect its ideas from outsiders.

Another example of specialized internal lending is consumer credit. Many firms that produce consumer durables (such as automobiles and white goods) have consumer credit organizations that operate entirely independently of the internal capital market of the firm, and even provide credit services to outside clients. For instance, General Electric's Financial Services Division not only provides credit to GE's own customers, but also provides banking and other financial services to the public. However, it should be noted that developing specialized internal lending capabilities does not ultimately overcome the problem of bounded rationality. Financial divisions, like any other division of a diversified firm, must still be monitored by the CHQ. In GE's case, lack of CHQ oversight of its financial services division incurred huge losses for the parent firm in the 1980s.

4. Limiting the Scope of the Firm. A final organizational solution to the problem of information incompleteness in internal capital markets is, of course, to carefully control the types of investment that are made by a CHQ. In particular, the discussion here suggests that a diversified firm should avoid internalizing a business that is capital-sufficient, unless other benefits of diversification are large.

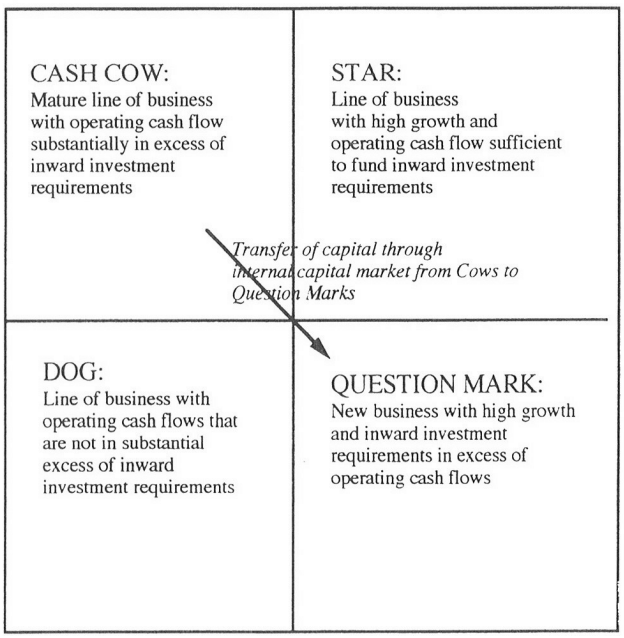
The Reliability of Capital Supply in Internal and External Capital Markets

The second argument put forward in favor of internal capital markets is that they can improve the reliability of capital needed for investment, thereby reducing inefficient "choking off"—underinvestment that can result from fluctuations in capital supply and/or interest rates in the external capital market.

There is ample evidence that the lending policies of IFIs fluctuate. For instance, Rajan (1994) finds that New England banks altered their credit policies following a downturn in the local real estate market. Banks also cut back on credit in response to monetary policy shocks (Gertler and Gilchrist 1994). Finally, the supply of capital in external markets may be changed suddenly by cascades in investor opinion (Welch 1992).

Henderson (1970, 1979) has argued that internal capital markets can correct for such lack of reliability in external capital supplies. Specifically, he proposes that in a diversified firm, lines of business in capital surplus can supply capital-constrained lines of business so that the value of inward investments is protected. This argument is embodied in Boston Consulting Group's well known portfolio planning model (the "BCG model"), shown in Figure 2. According to this model, a diversified firm can become capital-sufficient in the aggregate by configuring its business portfolio so that cash sources and uses are balanced over time between (a) mature businesses with high operating cash flows and low inward investment requirements ("Cash Cows"), and (b) new business ventures with low operating cash flows and high inward investment requirements ("Question Marks"). This portfolio structure allows a firm to ensure capital supplies to new, Question Mark businesses. Henderson's argument, then, principally addresses the issue of lender type: a CHQ is argued to be a more reliable supplier of capital to a given capital-constrained line of business than an IFI, were that business organized as a focused firm. However, Henderson's arguments also have economically important implications for lines of business that are not capital-constrained.

Figure 2 Capital Reliability in the BCG Portfolio Model



The Reliability of Capital Supply when Lines of Business are Capital-Constrained: The Lender-Type Effect

There have been numerous criticisms of the managerial aspects of the BCG model; I will not reiterate these here (see, for example, Seeger 1984). What is important to note, from the point of view of this study, is that there are conditions that need to be satisfied in order to assert that a CHQ is a more reliable supplier of capital than an IFI, and that this increase in reliability is economically significant.

The first condition that needs to be satisfied is that the value of an investment in a given capital-constrained line of business must decline if it is delayed. As discussed earlier, many types of investment are sensitive to delay (Hirschman 1967, Rich and Dews 1986, Eisenhardt 1989, Vesey 1991, Kulatilaka and Perotti 1994).[15] However, not all investments are time sensitive. Hence, a focused firm may also be able to protect the value of its nonpostponable investments by delaying other investments when external capital supplies are constrained. Only lines of business with large stocks of nonpostponable investments, relative to available capital supplies, will be able to benefit from increases in the reliability of capital supply offered by internalization.

A second condition that needs to be satisfied is that the internal cash flows of a diversified firm should be insulated from capital constraints in external markets. However, when external capital is constrained, interest rates increase, increasing a firm's costs and possibly reducing its revenues (Gertler and Gilchrist 1994). For instance, if a firm's suppliers have high inventory carrying costs, increases in external interest rates will increase the cost of its inputs. Concomitantly, a firm's buyers may require purchase financing, so that when interest rates rise, revenues and/or demand will fall. Hence, the capital supplied by a diversified firm's Cash Cows will be insensitive to interest rates only in firms that have interest-rate insensitive buyers and suppliers.

A third condition required to satisfy the capital reliability argument is that the supply of capital from Cash Cows and the demand for capital from Question Marks must be negatively correlated over time; otherwise, the advantages from internalization will be only temporary. Yet, it is difficult to predict cash flows, even in mature lines of business. For instance, a Cash Cow may suddenly become capital-constrained because its industry becomes more competitive, or it experiences increased costs due to (for example) to changes in environmental or product safety regulations, or foreign exchange rate fluctuations. Concomitantly, the investment demands of a Question Mark business may suddenly increase. Such sudden and unanticipated changes can jeopardize the supply of capital to the capital-constrained business, unless a diversified firm has additional sources of capital it can obtain from external markets. It is therefore possible that more investment will be choked off in an internal capital market than would be the case if the lines of business of the diversified firm were organized as independent firms. Schlingemann et al. (1999) find support for the argument that internal capital markets can result in underinvestment. They find that diversified firms are more likely to spin off lines of business when they are capital-constrained, and that that the divesting firms have lower rates of inward investment in their lines of business than other firms in the same industries.

Finally, it should be noted that both diversified and focused firms can store capital. Hence, a line of business with nonpostponable investment needs can be reliably supplied even within a focused firm. For example, Teitelman (1989) documents how Genentech, a biotechnology firm founded during the early 1970s, stored the capital it raised from its initial public share offering (IPO) in the expectation that the equity market would sour on biotechnology firms in the future. To protect its capital supply into the future, Genentech hoarded its equity funds and financed its ongoing operations by entering into long-term R&D contracts with established pharmaceutical firms. Consequently, an internal capital market will add value if and only if the capital-constrained businesses of a diversified firm have such long-term borrowing needs

that they cannot store sufficient capital themselves, or replenish their capital stock sufficiently, to outlast downturns in external capital markets. For example, a new firm seeking capital to fund nonpostponable investments may face a weak IPO market for a number of years in a row. Such a case is documented by Werth (1995), who describes how new biotechnology firms were confronted with two long-term IPO market downturns in the late 1980s and the early 1990s at precisely the time that the firms needed large infusions of capital. As a result, a number of these firms were unable to continue to compete as independent entities and were bought out by more established firms that could continue to fund their research from internal funds. However, these latter firms were not necessarily diversified.

The Reliability of Capital Supply when Lines of Business are Capital-Sufficient: The Centralization Effect

It may appear at first blush that the capital reliability argument has implications only for lines of business that are capital-constrained. However, in order for a diversified firm to supply capital to capital-constrained lines of business through its internal capital market, it must have internalized one or more lines of business that are in capital surplus. These lines of business will bear costs of centralization within the diversified firm.

It is noteworthy that some of the administrative costs of centralization discussed earlier in this section stem from delays in investment—the very phenomenon that internalization is argued to remedy in Henderson's arguments. Moreover, the "stickness" observed by Shin and Stulz (1998) would also mitigate against an efficient rate of transfer of cash from Cows to Question Marks, reducing the value of internalization.

Another source of centralization costs related to the issue of capital reliability is underinvestment. This can occur if a diversified firm has a close balance between its sources and uses of investment funds, and then experiences an increase in investment needs in either a Question Mark or a Cash Cow business which cannot be met from either internal or external sources (e.g., the firm has no spare debt capacity). Under these circumstances, the firm's capital shortfall can be met in one of two ways: (a) the diversified firm can underinvest, or (b) it can divest one or more Question Marks to restore the balance between its sources and uses of funds. Underinvestment may occur in either the Cash Cow, which may have more capital extracted from it than optimal, or in a Question Mark, if the Cash Cow is allowed to maintain investment at an efficient level. In either case, centralization of investment decisions within the diversified firm has resulted in underinvestment costs. Again, this argument is supported by the findings of Schlingemann et al. (1999).

Summary

As in the case of the information completeness argument, the discussion here has shown that, all other things being equal, there are some economically important instances in which the capital reliability argument may hold when:

(A) *A line of business is capital-constrained;* and

(B) Either:

(B.1) *The business involves investments that are nonpostponable.* The value of these investments may be significantly reduced by any delays in funding. Hence, if external capital supply fluctuates in long cycles that are independent of the long-run value of nonpostponable investments, internalization will create value, so long as the diversified firm is in overall capital surplus; and/or

(B.2) *The business involves long-term programs of investment.* Interruption of a long-term investment program for lack of funds can also be very costly. If internalization can avoid such costly interruptions, it will create value.

For capital-sufficient lines of business, however, internalization may incur significant costs of under- or overinvestment. Yet, ironically, if a diversified firm is to increase the reliability of capital supply to capital-constrained businesses, it must perforce internalize lines of business that have surplus capital.

Organizational Solutions to Problems of Capital Reliability in Internal Capital Markets

As in the case of information completeness, there are some organizational solutions that can reduce the costs of centralization when diversification is motivated, inter alia, by the need to increase capital reliability. The central problem to be resolved is that of using the cash flows of the firm to guarantee the supply of investment capital, without incurring the costs of under- or overinvestment that result from changes in investment demands and/or stickiness in investment rules.

One solution to these problems is partial ownership of the lines of business of a diversified firm: a line of business can be incorporated as a separate subsidiary business entity whose shares are owned partly by the parent firm and partly by outsiders. Such an arrangement may have the following advantages:

1. Capital Storage at the Line of Business Level. A partially-owned subsidiary can raise and store its own capital, independent of the capital stocks of the parent firm. This can serve to decouple investment at the line of business level from possible fluctuations in the cash flows, or from lack of debt capacity, in the parent firm.

2. Protection of Stored Capital at the Line of Business Level. A partially-owned subsidiary corporation can

protect its capital stocks from changes in investment demand within the parent firm. This is because a parent firm is not legally permitted to invade the capital of a subsidiary corporation without the consent of the subsidiary's shareholders, as this could defraud the outside investors in the subsidiary. (This type of protection is called a "freeze-out" protection; it prevents a majority shareholder from ignoring the interests of minority shareholders in the firm.)

3. Flexibility in Sourcing Capital. A capital-constrained line of business that is organized as a partially owned subsidiary firm can raise capital from the parent firm for certain nonpostponable investments, and raise capital for other postponable investments from external sources as and when external market conditions permit. The parent firm thus becomes a guarantor only of the most critical investments of the subsidiary.

4. Allocation of Capital Relative to Profitability. Finally, a line of business of a diversified firm has an independent market valuation. Thus, it should be able to raise capital proportional to its own expected assets, cash flows and profits, regardless of whether it is large or small, profitable or unprofitable, in relation to the other lines of business of the firm. Hence, partial ownership decouples rates of investment in one line of business of a diversified firm from the investment demands of its other lines of business, and so shields that business from the effects of stickiness in resource allocation rules (Shin and Stulz 1998).

In a sense, partial ownership is a "hybrid" organizational arrangement that allows a capital-constrained line of business to benefit from the existence of a parent firm in some circumstances, while protecting capital-surplus businesses from the spillover costs of being associated with that same firm.

In recent years, the BCG model has fallen out of favor, not least because it has been blamed for instilling hubristic and formulaic attitudes towards diversification. Yet, the discussion here suggests that perhaps the model deserves a more careful reassessment. The managers of companies such as General Electric and Merck have long argued that one way they are able to create value is by providing a stable investment environment for long-lived development projects. The conclusions drawn here are partially consistent with this argument. It should also be noted, however, that the move towards monetarist policies in the United States and other developed economies has resulted in remarkably stable money supply and interest rates. If these trends persist, internal capital markets may no longer offer any advantage in terms of reliability of capital supply in these countries.

Agency Costs of Free Cash Flow in Internal and External Capital Markets

The third possible source of benefits from internalizing capital market functions within a diversified firm is that of economizing on agency costs of free cash flow. Both theory and evidence indicate that managers who have firm-specific human capital investments, and who are not the undiluted owners of a firm, have incentives to diverge from profit maximization by investing corporate capital in personal perquisites, and in growth and diversification that does not return the cost of capital (Marris 1964, Williamson 1964, Jensen and Meckling 1976, Amihud and Lev 1981). Jensen (1986, p. 323) calls these costs, "agency costs of free cash flow."

Arguably, managers' propensity to incur agency costs of free cash flow is restrained by the market for corporate control: firms in which managers consistently misinvest capital will be taken over, and/or their managers will be disciplined, usually by losing their jobs (Manne 1965). However, as Williamson (1975) observes, corporate control transactions are costly. He argues that substituting the CHQ of one large (M-form) firm for the CHQs of a number of smaller, specialized firms (lines of business) can reduce agency costs of free cash flow, because the CHQ of the diversified firm can impose profit-maximizing behavior on the managers of the lines of business of the firm at lower cost that could the external market for corporate control. This is because

> The capability [of the CHQ] to intervene prescriptively . . . [in a diversified firm] . . . serves to augment [the CHQ's] credibility as an internal control agent. . . . thereby securing a higher level of adherence to profit maximization than the unassisted capital market could realize. (Williamson 1975, pp. 146–148.)

In this section, I explore the implications of this argument in relation to the Centralization Effect and the Lender-Type Effect. I have reversed the order of the discussion here because, as the reader will see, the arguments regarding the effects of lender type are dependent on understanding the effects of centralization on agency costs.

Agency Costs when Lines of Business Are Capital-Sufficient: The Centralization Effect

It is a broadly accepted proposition that, if a firm seeks to borrow capital from external lenders, those lenders will either lend or withhold funds depending on their own valuations of the investments for which funds are being sought. Thus, IFIs discipline borrowing firms and do not fund managers' self-serving investments (Jensen 1986, Stulz 1988). As a result, borrowing by a capital-constrained, focused firm necessarily subjects that firm to

capital market discipline, without incurring the cost of a corporate control transaction.[16]

Neither a capital-sufficient line of business organized as a focused firm, nor a capital-sufficient line of business governed by the CHQ of a diversified firm, is subject to this same discipline. Assuming that mechanisms of partial corporate control, such as effective boards, are equally distributed across capital-sufficient focused firms and capital-sufficient diversified firms, the only way in which agency costs of free cash flow can be controlled at the margin in either of these types of firm is through takeover or other types of corporate control actions (Jensen 1986, 1993). In the focused firm, the management will be the target of corporate control transactions; in the diversified firm, the CHQ management will be the target of corporate control transactions. Therefore, any differences in the ability of the market for corporate control to reduce agency costs of free cash flow between focused and diversified firms will depend critically on what assumptions are made about the behavior of the costs of corporate control in small (focused) or larger (diversified) firms. This can be illustrated as follows.

Let there be N separate, focused firms, each with identical free cash flows of F, and let the managers of each of these firms have a propensity to incur agency costs of free cash flow at a variable fraction ω of F where $0 < \omega < 1$. In addition, let the cost of corporate control transactions in these firms be T. Assuming that all managers have preferences to maximize ω, they will always incur a level of agency costs that is a small amount ϵ below the level that would induce a disciplinary takeover: $\omega F = T - \epsilon$. The exact level of agency costs incurred in each firm will thus depend on the level of F and on the behavior of T relative to F. Let $F = \$100$ for each focused firm, and let $N = 2$, so that the free cash flows of the diversified firm are \$200. Let $\epsilon = \$0.01$. The level of agency costs in the focused firms and the diversified firms can then be shown to depend on the behavior of T by considering three different situations:

1. T Is a Constant. Let the cost of a takeover that would discipline a firm's management be \$20, regardless of firm size. In a focused firm with free cash flows of \$100, agency costs (ωF) will then be \$19.99 ($= T - \epsilon$), so that total agency costs in the two focused firms are \$39.98. Agency costs in the diversified firm with cash flows of \$200 will be only \$19.99. Hence, internalization reduces agency costs of free cash flow by half. In this case, Williamson's argument is supported. However, it is unrealistic to assume that T is a constant; takeover costs rise with free cash flows, which are reflected in the market value of a firm and hence, in the price of obtaining control. For instance, there are costs of accumulating shares, such as increased commissions and borrowed funds. Hence, T can be generally characterized as being monotically increasing in F.

2. T Increases with F. One way T can increase with F is at a fixed rate, so that $\delta T/\delta F = 1$. Assume $T = 0.2 F$. In this case agency costs of free cash flow will be \$19.99 in each focused firm, for a total of \$39.88, and will also be \$39.98 in the diversified firm. Agency costs of free cash flow will be lower in the diversified firm only if T increases in relation to F at a decreasing rate: $0 < \delta T/\delta F < 1$. In this case, as $\delta T/\delta F \to 0$, the difference in agency costs $\to$ \$19.99, as per situation one.

3. T Is Increasing in F. Contrary to situations one and two, empirical evidence suggests that T increases at an increasing rate with regards to F (i.e., $\delta T/\delta F > 1$) so that corporate control costs are disproportionately higher in larger firms.[17] For instance, because individual wealth is constrained, imposing market discipline on large firms through the threat of takeover requires coalitions of shareholders that are costly to form and maintain. In small firms instead, individual shareholders may have sufficient wealth to exert effective control without forming coalitions. Let $\delta T/\delta F = 1.1$. In this case, in a focused firm, T is still \$20 , so that agency costs are \$19.99 in each focused firm, and \$39.98 for both focused firms. In the diversified firm with cash flows of \$200, T is \$42 ($= \$20 + (\$20 \times 1.1)$), so that agency costs are \$41.99. In this case, diversification increases agency costs of free cash flow, consistent with Jensen's (1986) arguments.

It is important to note here that the issue at question is the degree to which agency costs are incurred in an *entire* firm. Consequently, the issue of whether or not a CHQ can reduce agency costs of free cash flow at the line of business level (as Williamson (1975) has argued) becomes—in the aggregate at least—an irrelevant consideration. For any given level of T, agency theory predicts that the *total* potential agency costs of a firm will be same, be they incurred at the line of business level, or the corporate level. To argue otherwise is to assume that CHQ managers have a de facto lower propensity to incur agency costs than the managers of lines of business—an assumption that is inconsistent with economic reasoning (Hill 1985).

Agency Costs when Lines of Business Are Capital-Constrained: The Lender-Type Effect

As noted above, a line of business that is capital-constrained and that is organized as a focused firm will be subject to the discipline of borrowing; lenders will not fund investments that are not expected to return the cost

of capital, so that agency costs of free cash flow in that firm can be contained at less cost than is possible for a capital-sufficient business which can be disciplined only through takeover. A capital-constrained line of business of a diversified firm will be subject to the same discipline if and only if the diversified firm is capital-constrained in the aggregate, so that it must seek funding from IFIs. If a diversified firm's sources of capital equal or exceed its uses of capital, it will not be subject to the discipline of borrowing, so that additional agency costs can be incurred by internalization. This implies that increasing capital reliability within a diversified firm, as intended by the BCG model discussed previously, will inevitably increase agency costs, ceteris paribus.

Summary: Internal Capital Markets and Agency Costs of Free Cash Flow

The discussion in this section has examined the effects of both centralization and lender type on agency costs of free cash flow. The discussion here has shown that, if reasonable assumptions are made about the behavior of takeover costs, centralization of capital administration functions within a diversified firm will not reduce agency costs of free cash flow when lines of business are capital-sufficient, and may well increase them. When lines of business are capital-constrained, internalization can also increase agency costs.

Organizational Solutions to Agency Costs in Internal Capital Markets

One approach to reducing agency costs of free cash flow in a diversified firm is to organize the lines of business of that firm as partially owned subsidiaries. Partial ownership places restrictions on flows of capital between a subsidiary and its parent firm, so that CHQ managers cannot use the cash flows of a partially held subsidiary to (self-interestedly) cross-subsidize other businesses without the full consent of the subsidiary's shareholders. Thus, partial ownership replaces an internal capital market with an external capital market with respect to capital flows from the subsidiary to the parent firm. Another benefit of partial ownership stems from reduced takeover costs. If takeover costs are proportionately increasing in firm size, it is less costly for the shareholders of a subsidiary firm to discipline that firm's managers than it is for the shareholders of the parent firm to do likewise, so long as outside shareholders own a majority of the subsidiary's shares.

Concluding Remarks

This essay has examined three well-known arguments in favor of internal capital markets. This analysis differs from previous discussions of this topic in two respects. First, because three different arguments have been considered, a more complete picture of the possible gains and losses associated with internalization has been provided. Second, this analysis has considered two effects of substituting internal capital markets for external capital markets: the effects of changes in lender type, and the effects of centralization of investment decisions. Only by considering both effects can the comparative efficiency of internal capital markets be assessed. Again, previous analyses have tended to omit consideration of one or the other.

The discussion in this essay leads to three main conclusions regarding the comparative efficiency of internal capital markets, as follows:

1. Broad Generalizations about the Relative Efficiency of Internal Capital Markets Cannot Be Made. The relative efficiency of internal capital markets relative to external capital markets depends on a wide variety of conditions. This conclusion contrasts with the arguments of Williamson (1975), Jensen (1993), and others who generally favor or disfavor internal capital markets relative to external capital markets. In contrast to these authors, the discussion here suggests that there is a relatively small number of specific circumstances in which it can be asserted that the substitution of an internal capital market for an external capital market will create value. These circumstances include (a) when firms have valuable trade secrets; (b) when external lenders are relatively poorly informed; and (c) when lines of business have investment programs that are highly sensitive to delay or interruption. It is important to note, moreover, that *all of these benefits accrue only to capital-constrained businesses:* they stem from changes in lender type and not from centralization. For capital-sufficient businesses, this essay concludes that centralization of capital allocation functions within a diversified firm tends to impose additional costs, rather than bestow benefits. Hence, the overall level of benefits generated by an internal capital market will depend on the ratio of capital-sufficient businesses to capital-constrained businesses that it governs: the higher the proportion of capital-sufficient businesses, the less likely it is that net benefits will be generated.

2. The Comparative Benefits and/or Costs of Internal Capital Markets Can Be Nontrivial. A diversified firm may be able to generate significant benefits from preventing delays in time-sensitive investments, or through protecting proprietary knowledge. On the other hand, such a firm may also incur significant costs in its internal capital market from centralization of investment decisions; from misinvestment due to comparatively incomplete information; from under- or overinvestment due to

bureaucratic stickiness or shortages in internal cash flows; from investment delay; and from increases in agency costs. As a result, the value of a diversified firm can be significantly influenced by the relative efficiency of its internal capital market, over and above the presence of other benefits of diversification, such as economies of scope or extension of market power. In many instances where internalization of transactions of real goods or services may be efficient, internalization of capital transactions may not.

3. The Relative Efficiency of an Internal Capital Market Can Depend Partly on Its Organization. I have described a number of organizational arrangements that a diversified firm may adopt in order to reduce inefficiencies in its internal capital market. For instance, the cost of incomplete information may be reduced by arrangements such as partnered lending or specialization in internal lending, while partial ownership of lines of business can increase capital reliability and reduce agency costs.

The discussion here also points to the importance of understanding the roles of internal and external capital markets as being both dynamically fluctuating and highly interdependent. On the one hand, innovations in external capital markets can increase the relative costs of internal capital markets. For instance, new developments in asset securitization and project finance may reduce the cost of leasing assets, relative to buying them (Merton 1995). Such innovations may induce firms to "unbundle" their financial transactions from their real goods transactions through cofinancing, sale-leaseback, and other types of arrangements that shift lending activities from firms to markets. On the other hand, instability in external capital markets may increase the relative efficiency of internal capital markets in protecting the value of delay-sensitive investments. Hence, periods of instability in external capital markets should witness increasing internalization of certain types of investment, and vice versa.

These insights may be important in understanding the observed trends in the U.S. economy of increasing diversification among large firms between 1920 and 1980 and more recently, of de-diversification (Liebeskind and Opler 1995). Writ large, these trends can be understood as bearing witness to the shifting efficiencies of internal and external capital markets. For example, most of the conglomerates formed during the 1960s—the best example of firms formed to exploit supposed internal capital market efficiencies—had been dismantled through takeover or restructuring by the end of the 1980s.[18]

Understanding the benefits and costs of diversification remains a critical issue for both researchers and managers. Despite the restructuring boom of the 1980s, large diversified firms still dominate the U.S. economy (Montgomery 1994). Yet, there has been very little research to date on the issue of internal capital markets. Consequently, the one overarching conclusion that emerges most clearly from this study is that we have a great deal to learn about the comparative efficiency of internal and external capital markets. Hopefully, this study will serve to stimulate more research—both theoretical and empirical—on this economically important topic.

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Endnotes

[1]Alchian and Demsetz (1972) provide a theory of the financial claims structure of the *corporation.* Also, there is an extensive body of theory in financial economics on the ownership and capital structure of firms. These theories, however, do not directly address the question of the existence or boundaries of the firm, as do Coase and his followers.

[2]Important contributions have been made to understanding capital allocation decisions within firms by Bower (1970) and Bromiley (1986). A very extensive literature (finance and banking) also exists on the effects of the organization of financial institutions and the regulation of markets on capital allocation. My point here is that very little research has been done in considering the efficiency consequences of the simultaneous internalization of noncapital and capital transactions.

[3]Obviously, important distinctions exist between these different forms of IFIs. However, both diversified and focused firms can borrow funds from the same menu of IFIs, so differences among IFIs are not considered here.

[4]Detailed studies of internal capital markets (Bower, 1970; Bromiley, 1986) do show that managers of lines of business in a diversified firm have discretion to make some investments without direct CHQ approval within a variable cash limit. However, total expenditures for each line of business are always budgeted at the corporate level.

[5]For example, Kaplan and Zingales (1995) find that some firms in which investment and cash flow are highly correlated also raise external financing, including equity; Helwege and Liang (1994) find that the rate of external financing in IPO firms, where information asymmetries should be most severe, is not dependent on cash flow availability; and Opler and Titman (1994) find evidence inconsistent with the argument that information asymmetries influence firms' choices between equity and debt.

[6]Large diversified firms are required to report summary performance data for business "segments" according to FASB regulations. In practice, this information typically is insufficient to make accurate inferences about a firm's performance within specific markets.

[7]There are also agency theory arguments to the effect that managers might be able to withhold more information from outside investors for opportunistic reasons, than they could withhold from a CHQ. However, this argument is not clear-cut; there is both empirical evidence and theoretical argument that suggests that divisional managers within firms are amply able to withhold information from the CHQ. (See, for example, Schiff and Lewin (1970)).

[8]Banks in Germany and Japan can also own equity in the firms to which they lend, although in the United States this practice is highly discouraged by regulations governing debt prioritization (Gorton and Schmid 1994.)

[9]It is commonly argued that bounded rationality constraints affect the most widely diversified firms the most severely. However, Lang and Stulz (1994) find that the largest difference in firm value exists between single-business firms and firms with two or more lines of business; they found no significant difference in value between firms with two lines of business and firms with more than two lines of business.

[10]Another factor that may favor CHQs is a shortage of managerial talent. If competent managers are in short supply, it is possible that the CHQ of a diversified firm may add value by providing good business judgment to lines of business. However, competent managers could also manage a focused firm, in which case their talents would be less diffused. There is no particular reason why more competent managers should be located in a CHQ, rather than elsewhere. Also, it is possible that competent managers at the line of business level in a diversified firm could by controlled by an incompetent CHQ.

[11]Of course, this will not be true if debt and equity are privately held.

[12]The "true" value of an investment is the present value of its net cash flows over its lifetime. Typically, accounting values that are used by firms do not approach these true values. For instance, depreciation is typically estimated according to tax-related conventions, rather than reflecting the real rate of economic depreciation of assets. These problems are exacerbated when firms operate in uncertain environments, so their assets depreciate at unpredictable rates. See, for example, Ijiri (1979).

[13]I am not suggesting here that capital markets are perfectly efficient in terms of fundamental valuation; evidence indicates that they are not. For a discussion, see Bromiley (1990). Here, I am merely pointing out that established economic theory suggests that markets (IFIs) will make fewer errors in valuation than CHQs.

[14]This section of the essay is, in essence, a replication of the argument between Von Mises and Hayek on the one hand, and Lange on the other. The Von Mises/Hayek point of view—markets are more efficient in allocating resources—is now well established. See Heilbronner (1993) for a useful summary of this earlier debate.

[15]For instance, pharmaceutical firms are essentially racing for exclusive patents to specific products. A firm that postpones investment in drug development due to lack of external capital is likely to be beaten in this race by any firm that can afford to maintain levels of investment regardless of external capital market conditions. In other cases, it is interruption, rather than delay, that is costly. For example, it takes many years to develop a new airframe, and interrupting and restarting such a development program due to unreliable capital supply incurs high excess costs (Rich and Dews 1986). The same applies to interrupted construction programs.

[16]A large body of theoretical and empirical literature in corporate finance argues that increasing the debt levels of firms reduces agency costs, because it subjects the investments of the firm to the oversight of banks and other lenders who want to ensure that their obligations will be repaid. See, for example, Grossman and Hart (1986) and Stulz (1988). Note, however, that enforced leveraged recapitalizations are, in effect, corporate control transactions; in these instances, the costs of corporate control must be incurred to impose capital constraints on a firm.

[17]For example, Ambrose and Megginson (1992) and Comment and Schwert (1993) find that, after controlling for performance and other factors that determine takeovers, takeover likelihood is negatively related to firm size, rather than indifferent to it. Moreover, evidence from the 1980s shows that many corporate control transactions in large firms followed the innovation of the "junk" bond which reduced the costs of takeovers and LBOs in these firms, suggesting that these firms were less vulnerable to corporate control transactions than previously.

[18]For example, consider the following firms, classified by Rumelt (1974) as being acquisitive conglomerates in 1969, all of which have been taken over, or extensively restructured: AvCo, Bangor Punta, Brunswick, Colt Industries, Eltra, General Host, Glen Alden, W. R. Grace, Lear Sigler, Litton, Questor. Other conglomerates that disappeared or were extensively restructured during the 1970s and 1980s are Textron, LTV, Teledyne, Beatrice, IT&T, and Gulf + Western.

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