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The efficiency of internal capital markets: Evidence from the Annual Capital Expenditure Survey

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ABSTRACT

Does firm diversity result in an efficient or inefficient allocation of capital? Are diversified firms “value creating” or “value destroying”? We apply a panel data model to examine the relationship between firm diversity and firm value using both COMPUSTAT and the Annual Capital Expenditure Survey (ACES) data. Our main empirical result confirms that firm diversity is negatively related to the efficiency of investment (firm value), which is consistent with the majority findings of recent studies. However, once we distinguish between capital expenditure for structures and equipment, we find that while firms do inefficiently allocate capital for equipment, they efficiently allocate capital for structures. These results suggest that when the decision has long-lasting repercussions, headquarters will, more often than not, make the correct choice.

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1. Introduction

The internal capital market study begins with the development of the transaction cost economics theory of the firm by Williamson (1970). Following his own theory, Williamson further develops the M-form hypothesis proposing that as firms become larger and complex, the most efficient organization structure is a multi-divisional one. The advantage of this structure is the corporate headquarters, via its control mechanism (incentive, monitor and audit), can allocate the resources to their best uses for achieving the profit maximization goal. Early empirical work by Steer and Cable (1978) and Teece (1981) generally support the M-form hypothesis.

In recent years, there has been a renewed focus on the internal capital markets of diversified firms. A number of papers have taken up the question of whether these markets are efficient.⁴ If frictions in external credit markets mean that positive net present value projects are not undertaken, then the ability of internal capital markets to finance these projects is of great interest. While theoretical studies are split on whether diversification can be “value creating,” the majority of empirical investigations provide evidence that diversification is “value destroying” in the sense that firm resources often flow from high-performing efficient divisions to low-performing inefficient divisions.⁵

In this paper, we take a fresh look at this issue by utilizing a new and unique dataset – the Census Bureau’s Annual Capital Expen-

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E-mail addresses: sagarwal@frbchi.org (S. Agarwal), ichiu@camden.rutgers.edu (I.-M. Chiu), victor.x.souphom@census.gov (V. Souphom), gyamashi@csulb.edu (G.M. Yamashiro).¹ Tel.: +1 312 322 5973.² Tel.: +1 301 763 3334.³ Tel.: +1 562 985 5054.⁴ A summary of referred studies on diversified firms and their efficiency is provided in Table 1.⁵ Most empirical studies using COMPUSTAT data and Tobin’s *q* as a measure of investment efficiency find that internal capital markets are inefficient. However, studies use business census data (Villalonga, 2004) or plant-level information from the government data (Maksimovic & Phillips, 2002) find evidence that internal capital markets are efficient. Please refer to Table 1 for more details.

diture Survey (ACES). The availability of detailed segment-level capital expenditure data in the ACES enables us to take a closer and more critical look at the investment behavior of diversified firms. Our primary objective is to develop a better understanding of the nature of the inefficiency in investment, if any. In other words, does diversification always result in capital misallocation, or are there circumstances under which internal capital markets operate efficiently?

Theoretical arguments on the benefits of internal capital markets mainly focus on the inability of the external capital market to adequately fund profitable investment projects. Stein (2001) argues that if diversified firms are credit constrained, because of pronounced information and agency problems, the headquarters of a diversified firm is in a position to channel resources to their best use within a company.⁶ For example, since one division's cash flow can be used for investment by another division, if headquarters can correctly pick, and fund, those projects with the highest returns, diversification is value creating. An implication of this argument is that a division's investment is not dependent on its own cash flow, but is dependent on the cash flow of the firm. Lamont (1997) provides evidence for this type of investment interdependence in the oil industry. He documents that a decline in the cash flow of the oil divisions of petroleum firms lead to a fall in the investment of the non-oil divisions. The key question in terms of value creation, however, is whether internal capital markets are efficient. Do company headquarters make the right decisions and correctly allocate their scarce resources?

Recent empirical evidence says that they do not. Shin and Stulz (1998) document that a segment's investment is impacted by a decline in the cash flow of other segments regardless of the value of its investment opportunities,⁷ which is inconsistent with internal capital markets operating efficiently. Scharfstein (1998) examines capital allocation in a sample of 165 diversified firms and finds that divisions with high q tend to invest less than their stand-alone industry peers do, while divisions with low q tend to invest more than their stand-alone peers do. Further, there is evidence that diversified firms tend to have a lower Tobin's q , and trade at discounts relative to a portfolio of comparable stand-alone firms.⁸ While these findings are widely accepted, the precise mechanism through which diversification reduces firm value is still unsettled.

Theoretical models of internal capital markets generally explain the inefficient allocation of capital within diversified firms in the context of agency cost or influence cost models. In these models, the hierarchical process of capital allocation leads to the inefficient allocation of funds due to the actions of self-interested divisional managers. For instance, rent-seeking behavior by division managers leads to the subsidization of weaker divisions by stronger ones, or "socialism" in internal capital allocation (Scharfstein & Stein, 2000). These firms short-change their better performing divisions by over-investing in poor performers.

As Rajan, Servaes, and Zingales (RSZ, 2000) point out, however, it is often difficult to reconcile these models with the observed resource misallocation by diversified firms. For example, while empire building behavior on the part of CEOs can reasonably explain general overinvestment, it is not clear how this leads to firm resources systematically flowing from high q to low q divisions. RSZ (2000), instead, propose a model where internal power struggles

distort firm decision-making. Division managers have the option of investing in "efficient" or "defensive" investment opportunities. Since the ex-post surplus generated by an efficient investment is available to all other divisions, if headquarters does not provide sufficient safeguards to allocate the surplus then the division manager has no incentive to invest efficiently. In this model, capital transfers to divisions with weak opportunities are optimal, because it leads to increased cooperation in joint production. A further implication is that division managers in highly diversified, relative to less diversified, firms tend to choose defensive investments over efficient investments leading to investment distortions, and therefore, less valuable firms.⁹ Specifically, the model predicts a "U-shaped" relationship between diversity and efficient capital allocation. Thus, firms with very low, and very high, levels of diversity efficiently allocate capital. Using COMPUSTAT data from 1980 to 1993, RSZ (2000) find evidence consistent with their hypothesis. In that, to the extent that there is cross-subsidization (misallocation of capital) it is mainly found in large and well-diversified firms.

The focus of much of the existing empirical literature has, rightly, been on establishing whether or not diversification leads to the internal misallocation of capital. The question we ask in this paper, however, is slightly deeper. Does the *type* of investment matter for the efficiency of internal capital allocation?¹⁰ In other words, are there circumstances under which headquarters will make the "correct" decision, or does diversity always result in a misallocation?

By using both the ACES data and the updated (1998–2004) COMPUSTAT segment-level data, we first reinforce the findings of RSZ (2000).¹¹ The efficiency of investment, as measured by the value of the firm, is negatively related to diversity. This result is robust across datasets and methods of segmentation. Further, since ACES differentiates between investment in equipment and in structures, we investigate whether the inefficiency is specific to a particular type of capital. Interestingly, we find that while diversity has a negative effect on the efficiency of investment in equipment, it has a positive effect on the efficiency of investment in structures. Implying that diversity is "value destroying" in equipment, but "value creating" in structures. This is intriguing because it says that when making bigger and longer-term decisions, headquarters are, in a sense, more careful, and, as a result, correctly allocate their resources.

The rest of the paper proceeds as follows. We discuss the data and empirical methodology in Section 2. Section 3 documents the impact of diversity on the efficiency of internal capital allocation and firm value. In Section 4, we offer a few possible explanations for the results. Section 5 concludes.

2. Data

Section 2.1 provides a discussion of the segment-level data. We present some basic summary statistics in Section 2.2.

⁶ Similar arguments are made by Li and Li (1996) and Matsusaka and Nanda (2000).

⁷ Moreover, they find that segment investment depends significantly more on their own cash flow than on the cash flow of the firm's other segments.

⁸ See Lang and Stulz (1994) and Berger and Ofek (1995).

⁹ Wulf (2002) develops a model of influence activity and signal distortion by division managers in which headquarters relies both on private and public information from division managers in the ex-ante capital allocation process. Managers of large divisions, due to their influence on headquarters, are better able to distort private information. This model can be viewed in the context of the RSZ (2000) model, where the ability to influence equates with the power or strength of divisional managers.

¹⁰ This, of course, requires that we first establish that diversification results in the inefficient capital allocation.

¹¹ While our results do differ slightly from RSZ (2000), as will be explained in Section 3, this is mainly a function of the sample period.

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