Strategic Management Journal
Strat. Mgmt. J., **36**: 1017–1034 (2015)
Published online EarlyView 8 May 2014 in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/smj.2264
Received 20 March 2011; *Final revision received 5 March 2014*

EXAMINING A KEY CORPORATE ROLE: THE INFLUENCE OF CAPITAL ALLOCATION COMPETENCY ON BUSINESS UNIT PERFORMANCE

MATHIAS ARRFELT,[1]* ROBERT M. WISEMAN,[2] GERRY MCNAMARA,[2] and G. TOMAS M. HULT [2]
[1] *Department of Management, W. P. Carey School of Business, Arizona State University, Tempe, Arizona, U.S.A.*
[2] *Department of Management, Eli Broad Graduate School of Management, Michigan State University, East Lansing, Michigan, U.S.A.*

Research on the role of the corporate office in firm performance has focused on establishing how much performance variance can be attributed to a "corporate effect," with little attention devoted to understanding how this influence occurs. In this study, we model capital allocation competency as a dynamic managerial capability and find that lower levels of allocation competency in the form of excess investment to business units with relatively poorer future prospects reduce business unit performance. We also find that market conditions affect performance implications of capital allocation—allocation competency is more salient in more competitive markets. These results enhance our understanding of how the corporate office influences business unit performance through its role in allocating capital across business units. Copyright © 2014 John Wiley & Sons, Ltd.

INTRODUCTION

One of the more contentious issues in our understanding of firm performance is the role of corporate management (e.g., Bowman and Helfat, 2001; Misangyi *et al.*, 2006). Corporate strategy research dating back to the origins of strategic management (e.g., Barnard, 1938; Chandler, 1962) has long argued that corporate strategy and structure significantly impact the financial performance of affiliated business units within the corporation (Bowman and Helfat, 2001). In particular, strategy scholars have tried to gauge the relative contribution of the corporate office to firm performance by decomposing business unit performance into effects from corporation, industry, and business unit[1] (e.g., Brush, Bromiley, and Hendrickx, 1999; Hough, 2006; McGahan and Porter, 1997; Misangyi *et al.,* 2006; Rumelt, 1991). Results have varied, with early scholars (e.g., McGahan and Porter, 1997; Rumelt,

Keywords: capital allocation competency; overinvestment; corporate effect; corporate strategy; business unit performance
*Correspondence to: Mathias Arrfelt, Arizona State University, PO Box 874006, Tempe, AZ 85287-4006, U.S.A.
E-mail: mathias.arrfelt@asu.edu

[1] Variance decomposition studies have examined corporate (as well as industry and business unit) effects on business unit returns, but has referred to such effects in a number of different ways, such as effects on "business performance" (Adner and Helfat, 2003; McGahan and Porter, 2005) and as effects on "firm performance" (Misangyi *et al.,* 2006). In this study, we use "firm performance" to mean the performance of the entire corporation. When we use "business unit performance," we are focusing on the performance of individual business units. We also note that since a firm is a collection of business units, we follow prior research and assume that business unit performance aggregates to firm performance (e.g., Hough, 2006; McGahan and Porter, 1997).

1991) generally concluding much smaller corporate effects (and larger business unit and industry effects) compared to later scholars (Hough, 2006; Misangyi *et al.*, 2006). Thus, results indicate a role, albeit still controversial, for the corporate office in business unit and, by extension, in firm performance.

Variance decomposition studies, however, generally do not provide guidance in explaining how the corporate office influences performance beyond suggesting that any factor tied to the corporate office affecting business unit performance is by definition a corporate effect (for an exception and modeling of corporate factors, see Misangyi *et al.*, 2006). That is, they fail to explain which strategies, capabilities, decisions, and combinations thereof lead to a corporate effect, defined here in line with previous research as a directional effect of corporate factors on business unit performance (e.g., Misangyi *et al.*, 2006). This study aims to address this limitation by moving the discussion beyond examining how much corporate strategy matters to understanding what lies behind a corporate effect on business unit performance.

A key role of the corporate office is to decide how to allocate scarce corporate capital across organizational units. This internal capital market (Williamson, 1975) plays an important role in determining business unit performance since the efficiency in allocating corporate capital determines whether such funds are used optimally. In fact, compared to an external process where capital is allocated directly by capital markets or by banks and other financial institutions, internal managers may have better information to base allocation decisions on, leading to more appropriate allocations and the funneling of capital to the most promising business units (Williamson, 1975). Thus, we see the capital allocation competency of firms as a dynamic managerial capability in which corporate officers respond to business unit information when making capital allocation decisions. Corporate office competency should therefore influence the degree to which the corporate office influences performance by influencing the performance of individual business units through the allocation of capital among business units. By examining this relationship, we hope to achieve a better understanding of how resource management skills of the corporate office influence the role of the corporate office in business unit performance ("corporate effect"). In particular, we aim to make two contributions.

First, we extend the variance decomposition literature by responding to calls for research into what accounts for or determines individual decomposed effects (Bowman and Helfat, 2001; Misangyi *et al.*, 2006). Building on prior scholarly work (Adner and Helfat, 2003; Helfat *et al.,* 2007) that views the resource management process as an interplay between resource investment (Maritan, 2001) and resource deployment (Sirmon, Hitt, and Ireland, 2007), we argue that capital allocation competency can be viewed as a dynamic managerial capability with important influences on business unit performance. Specifically, deriving measures from the financial literature (Berger and Ofek, 1995; Rajan, Servaes, and Zingales, 2000), we argue that over- and underinvestment in a firm's business units harms business unit performance. We define overinvestment as allocating high levels of capital to business units with poor growth prospects. Underinvestment occurs when firms allocate low levels of capital to business units with strong growth prospects. Thus, this study extends Misangyi and colleagues' (2006) exploratory examination of strategic corporate factors by more thoroughly examining the connection between the competency with which capital is allocated and business unit performance (cf., Brush *et al.*, 1999).

Second, building on contingency theory (Donaldson, 2001) and its application to dynamic managerial capabilities (e.g., Sirmon and Hitt, 2009; Sirmon *et al.*, 2007), we develop and test arguments for how market conditions and firm diversification affect performance implications of capital allocation. In particular, we argue that competitive markets are more likely to reward appropriate allocations and be less forgiving and more likely to exploit poor allocations, resulting in stronger effects of over- and underinvestment on performance as markets become more competitive. Thus, corporate decision makers have a greater opportunity to improve as well as to damage business unit performance through their capital allocation decisions with increased market competition. Additionally, we propose that the type and level of diversification is likely to influence the impact of the firm's capital allocation competency. We argue that the effect of the allocation competency is likely to be stronger in unrelatedly diversified firms since the main role of the corporate office in these firms is to distribute funds and maintain financial control. For narrowly

DOI: 10.1002/smj

diversified firms, in contrast, the beneficial effects of internal capital allocation may be only part of the equation along with adequate cooperation between related business units (e.g., Hill, 1988; Hill, Hitt, and Hoskisson, 1992). This study therefore provides insight into the contingent value of a key corporate capability. By formally recognizing the moderating role of market conditions and degree of firm diversification, we hope to provide a more complete and nuanced understanding of the association between capital allocation competency and business unit performance.

In sum, by investigating influences of an important corporate factor—capital allocation competency—on business unit performance, this study identifies and addresses a number of gaps in the extant literature, thereby offering unique insight into how an important dynamic managerial capability affects the corporate contribution to business unit performance. Because few studies have investigated this association, this study should be viewed as a first step in building knowledge about performance implications of allocation competency.

THEORY AND HYPOTHESES

Diversified firms allocate capital across their business units with a final say (control rights in Stein's, 1997, language) in allocation matters given to the corporate office. This key corporate activity plays an important role in determining business unit and, by extension, firm performance since the efficiency of the internal capital market (Williamson, 1975) in allocating resources determines whether they are used in the best and most efficient way. That is, appropriate allocation of resources to business units with the highest potential for future rent creation (Makadok, 2001) increases business unit performance. Or, alternatively, excess allocations to business units with low prospects and under-allocation to business units with high prospects should have a detrimental effect on business unit performance. Thus, firms sharing this corporate competency should logically have stronger performing business units relative to firms that do not share it to the same extent. Bowman and Helfat (2001) and Adner and Helfat (2003) support this logic by suggesting a clear effect of "factors internal to the firm at the corporate level" (Adner and Helfat, 2003: 1011) on profitability, as dynamic managerial capabilities reflected in corporate strategic decisions add a statistically significant increment of variance in profitability. Therefore, the dynamic managerial capability reflected in the skill or competency with which the corporate office allocates capital becomes an important corporate-level driver of business unit performance.

Reflecting the skill with which the corporate office allocates capital, corporate managers decide on both the amount of capital to be deployed and its deployment. The allocation decision, therefore, breaks down into resource investment (Maritan, 2001) and deployment (Sirmon *et al.*, 2007). Based on the notion of asset orchestration (Helfat *et al.*, 2007), greater fit between each increases performance (Sirmon and Hitt, 2009). Translated to the context of capital allocation, this would mean that the appropriate (not too much or too little) level of investment capital allocated to business units with the (relatively) highest expected future returns should enhance their returns and thus increase business unit performance.

The deployment decision, in particular, is crucial to allocation competency and accompanying rent creation because it determines returns per unit of resource investment. Thus, maximized rent creation from appropriate deployment requires that factors associated with allocation competency are accounted for. Resource picking is one such factor where managers pick potentially undervalued assets to invest in (e.g., Makadok, 2001). Translated to our context of capital allocation, managers attempt to pick those business units to invest in that have the best performance potential as reflected in their prospects for growth (cf., Berger and Ofek, 1995; Lang and Stulz, 1994; Maksimovic and Phillips, 2002; Rajan *et al.*, 2000).

At the same time, deeply embedded capability-building resources (e.g., Makadok, 2001), viewed as internal productivity-enhancing processes or systems that may help the firm improve the productivity of other firm and business unit resources, may also drive allocation competency and rent creation. Because these resources may not be properly valued by resource markets, potentially due to their embeddedness, savvy managers may be able to identify them and direct capital to business units where they are abundant. Therefore, to differentiate between resource-picking and capability-building effects underlying allocation competency and to account

DOI: 10.1002/smj

for the possibility that a firm may have a competitive advantage in a business unit with poor prospects, we control for capability-building effects when modeling allocation competency on business unit performance.

A variety of individual- and firm-level factors can interfere with the ability of a corporate office to consistently achieve appropriate investment in strong prospect business units with high expected returns based on either resource picking or capability building. For example, optimism bias (Kahneman and Lavallo, 1993), narcissism (Chatterjee and Hambrick, 2007), hubris (Hayward and Hambrick, 1997), escalation of commitment (Staw, 1976), and simple self-interest (Jensen and Meckling, 1976) are just a few of the factors that may lead individual decision makers to misallocate capital by either underinvesting in units with positive return prospects or overinvesting in units with negative return prospects. These misallocations echo behavioral models that describe a boundedly rational approach in which attention, and presumably capital allocation, is driven by performance discrepancies rather than performance prospects. That is, firms anchor decisions around past performance with the purpose of correcting performance deficiencies rather than betting on future performance prospects (cf., Cyert and March, 1963; Gavetti and Levinthal, 2000). This backward-looking approach conflicts with the forward-looking logic of capital allocation and its emphasis on appropriate allocations of capital independent of past performance (Stein, 1997; Williamson, 1975). Thus, backward-looking decisions favoring additional investment to poor performers in an attempt to correct poor performance while limiting investment into well-performing entities is likely to interfere with appropriate investment allocations based on expected future returns, and have been found to lead to misallocation (Arrfelt, Wiseman, and Hult, 2013). We therefore identify instances of misallocations in the form of over- and underinvestment and investigate how they affect business unit performance.

Overinvestment and business unit performance

Overinvestment reflects inappropriate capital allocation due to a lack of fit between resource investment and deployment (Helfat *et al.*, 2007; Sirmon and Hitt, 2009). Overinvestment is defined as allocating high levels of capital to business units with relatively poor future growth prospects. Given that growth prospects reflect expectations of future returns (Skinner and Sloan, 2003), overinvesting or allocating capital toward investments with lower expectations of future returns is likely to have a negative effect on subsequent business unit performance by increasing the unit's assets without a commensurate increase in unit returns. Assuming that investments in business units also face decreasing marginal returns that may not immediately be reflected in growth prospects (since prospects update annually), this may lead to even lower future performance as each additional unit of overinvestment drives down expected returns even further. In sum, allocating capital to business units with relatively lower prospects for future returns is likely to result in lower unit performance. Formally stated:

Hypothesis 1: Overinvestment will reduce business unit performance.

Underinvestment and business unit performance

Underinvestment, defined as allocating low levels of capital to business units with strong future growth prospects, also reflects inappropriate capital allocation. We argue that underinvestment can inhibit the ability of business units to positively perform in at least two ways. First, underinvestment limits the degree to which unit managers can invest to exploit growth opportunities in their market. In these strong growth prospect markets, businesses are likely to have investment opportunities with positive expected marginal rates of return. If a business unit fails to receive adequate investment funds from the corporate office, the unit will not be able to exploit these investment opportunities and, as a result, will underperform its competitors who do receive the requisite funding. This can translate into loss of market share relative to rivals who are pursuing the growth opportunities available. Second and more starkly, underinvestment is likely to undermine the unit's ability to maintain competitive advantage or parity against rivals by limiting its ability to invest in enhancing its core competencies. These high growth prospect markets are likely to be seen as attractive markets in which to invest. As a result, firms competing in such markets are likely to face significant competition from well-funded rivals. Thus, underinvestment relative to rivals has

DOI: 10.1002/smj

the potential to leave a business at a significant competitive disadvantage that is likely to result in lower performance. Underinvestment, which occurs as the absence of sufficient investment in business units with relatively higher expectations of future returns, therefore suggests a negative effect on business unit performance.[2] Formally stated:

Hypothesis 2: Underinvestment will reduce business unit performance.

A contingent view of capital allocation competency

The contingency perspective (e.g., Donaldson, 2001) suggests decisions are embedded in contexts that are likely to play a role in the effectiveness of those decisions. We used a three-step approach to identify contexts or contingencies that may be particularly salient in the case of capital allocation decisions. First, we focused on contingencies that are likely to impact the effectiveness of capital allocation decisions given that we study performance implications of capital allocation. Second, we limited our attention to relatively general contingencies that may more broadly affect performance implications of capital allocation given the different mechanisms with which over- and underinvestment affect performance. Finally, we only focused on contingencies with strong theoretical and logical ties to capital allocation. Based on these three criteria, we selected two contingences, the level of market competition and the level of unrelated firm diversification, which are both likely to impact the effectiveness of capital allocation decisions, albeit for different reasons.

First, we believe that competitive markets should increase business unit performance consequences of corporate actions, especially when those actions provide opportunities for competitors to capture market space or gain advantage. This is because competitive markets, characterized by industry fragmentation, tend to exhibit more competitive actions than consolidated industries (Scherer and Ross, 1990; Young, Smith, and Grimm, 1996). In addition, fragmented industries tend to exhibit greater competitive complexity and unpredictability (Ferrier, 2001), increasing the vulnerability of less aggressive firms, since less aggressive firms are more likely to face market share erosion (Ferrier, 2001; Ferrier, Smith, and Grimm, 1999). Thus, firms in competitive markets are strongly motivated to pursue aggressive competitive actions in order to prevent market share loss. Extending this logic, it would seem that firms in competitive markets are more likely to exploit the miscues of rivals and thus be less forgiving of strategic gaffes. Thus, capital allocation errors that affect business unit competitiveness may have stronger performance implications for firms operating in more fragmented markets where competitive rivalry is more intense than for firms in consolidated markets where competition is generally more muted (Miller and Chen, 1994). In sum, capital allocation competency as reflected in over- and underinvestment is likely to have a stronger effect on performance in competitive markets, such that market fragmentation will moderate the association between capital allocation and business unit performance. Formally stated:

Hypothesis 3a: The negative effect of overinvestment on business unit performance increases with the degree of market fragmentation.

Hypothesis 3b: The negative effect of underinvestment on business unit performance increases with the degree of market fragmentation.

A second contingency affecting performance implications of over- and underinvestment is firm diversification. While we believe that allocation competency will allow the corporate office to have significant influence on business unit performance, the importance of this competency is likely to be contingent on the degree to which the firm is pursuing unrelated diversification. In particular, the work by Hill and colleagues (Hill, 1988; Hill *et al.*, 1992) suggests that benefits of the multidivisional structure (Williamson, 1975) are not uniform across firms with different levels of unrelated diversification. Instead, economic benefits for firms pursuing more narrowly focused diversification center on their ability "to exploit economies of scope" (Hill *et al.*, 1992: 502), in effect creating synergies by sharing resources or skills across business units

[2] Our arguments hold under conditions of positive marginal returns for further firm investments. Since firms can only be seen as exhibiting underinvestment when they invest at low levels in high prospect industries, we believe that this is a reasonable assumption. However, if there is a consistently negative marginal return to additional investment regardless of investment level, a positive effect on business unit performance is possible as investment is reduced.

DOI: 10.1002/smj

and thus enhancing their respective market positions (Porter, 1987). In more unrelatedly diversified firms, individual business unit resources and capabilities are less likely to be generalizable among the diverse businesses and thus less likely to be shared. As a result, economic benefits are more likely to stem from an internal governance mechanism that allocates capital effectively to competing business units. Considering that more narrowly diversified firms reap economic benefits by synergistic sharing of firm resources while more unrelatedly diversified firms reap similar benefits by competing for resources, an internal allocation process encouraging competition for capital may therefore disproportionally benefit more highly unrelatedly diversified firms by exploiting the diverse investment opportunities among the firm's business units instead of pursuing the internal sharing of resources and skills that underlie the performance of more narrowly diversified firms.

Thus, for more highly unrelated firms, the ability of corporate managers to appropriately distribute corporate investment funds will be more critical. Alternatively, for more narrowly diversified firms, differences in how firms allocate capital across their units should have less of an impact on performance outcomes. This logic suggests a stronger, more detrimental effect of over- and underinvestment in firms with a higher degree of unrelated diversification. Formally stated:

Hypothesis 4a: The negative effect of overinvestment on business unit performance increases with the degree of firm diversification unrelatedness.

Hypothesis 4b: The negative effect of underinvestment on business unit performance increases with the degree of firm diversification unrelatedness.

METHODS

Sample

The model requires data at business unit, firm, and industry levels. Following a number of studies (e.g., Hough, 2006; McGahan and Porter, 1997; Roquebert, Phillips, and Westfall, 1996), annual business unit data was collected from Compustat business segment database. This database reports up to 10 business units because the Securities Exchange Commission requires the identification of any business unit comprising 10 percent or more of consolidated firm sales. Each business unit is identified by a four-digit SIC code, which we used for identifying the corporation's primary and business unit industries. Annual business unit performance (return on assets; ROA, hereafter) was calculated as operating income divided by identifiable assets (e.g., McGahan and Porter, 1997, 2002; Misangyi *et al.,* 2006).

Our initial sample of yearly business unit performance covers the years 1998 through 2012. The start date coincides with Financial Accounting Standards (FAS) 131 superseding FAS 14 by becoming effective for fiscal years after December 15, 1997. This change in accounting standards represents a major change in how public firms account for and report their activities by making their business unit reporting more in line with how firms actually operate their business units. Referred to as a "management approach" (FASB, 1997: 4) for determining reportable units, this new standard specifies that firms split up broader "industry" or "line of business" reporting (required by the old standard FAS 14) into more narrow operating units (e.g., Walmart now reports four business units versus only one previously). This new rule allows for the aggregation of business units only if they are similar in terms of a number of characteristics, including the type and nature of products and services, type of production processes, type of customers, and, if applicable, also the nature of the regulatory environment (FASB, 1997: 17).

The data are screened in line with criteria and steps used by McGahan and Porter (1997) and followed by other studies (e.g., Misangyi *et al.*, 2006). To exclude business units that lack direct competitors (such as government entities) or economic significance in their respective industries, and thereby avoid biases leading to understated industry and overstated business unit effects (e.g., McGahan and Porter, 2002), we exclude all business units not containing a primary SIC designation, all business units that lack competitors in their primary SIC classifications in a specific year (i.e., monopolies), as well as all units classified as "not elsewhere classified," "nonclassifiable establishments," or "government excluding finance" (SIC codes in the 9000s). We also exclude all financial business units designated as "depository institutions" (SIC codes in the 6000s) because returns of financial institutions cannot be compared to those of other industries, as explained in McGahan and Porter (1997). In

DOI: 10.1002/smj

addition, since "single-year appearances and small units often are anomalous because they are created for the disposition of assets prior to exit" (McGahan and Porter, 1997: 51), business units with only one observation across the sample as well as units with sales and/or assets below $10 million are excluded. Finally, because single-business firms face a drastically simplified capital allocation process and because we cannot differentiate between allocations made by external and internal mechanisms for such firms, we include only firms with two or more business units. These adjustments result in a final sample size of 12,550[3] business unit years in our models of over- and underinvestment. This includes 3,660 different business units nested within 1,137 corporations and based in 418 industries at the four-digit level.

Dependent variables

Business unit performance

Business unit performance is measured as ROA and calculated as the ratio of operating income to assets following previous studies (e.g., McGahan and Porter, 1997, 2002; Misangyi *et al.,* 2006). Our investigation of a corporate-level factor (allocation competency) affecting business unit performance ties this study to the literature on corporate effects (e.g., Bowman and Helfat, 2001; McGahan and Porter, 1997, 2002; Misangyi *et al.,* 2006) because a corporate effect suggests the existence of individual corporate-level factors contributing to business unit performance. Therefore, the logic underlying this effect suggests that over- and underinvestment as well as contingent effects of each will directly affect business unit performance. With regards to variance explained, two types of effects can occur: year-to-year variations in business unit performance (transient variance) and variations in average returns across the study period (stable variance). Because we cannot *ex ante* exclude either type, we estimate variance components of both types and use them to calculate variance explained based on a comparison between complete and reduced models as explanatory variables are added.

[3] The reduced sample size here compared to previous variance decomposition research (e.g., McGahan and Porter, 1997, 2002; Misangyi *et al.*, 2006) is due to a number of reasons: the exclusion of single-business firms, the inclusion of control variables that have missing data for some firm years, and because only a portion of the remaining multibusiness firms exhibit over- or underinvestment.

Independent variables

Measures of allocation competency reflect managerial capability in allocating capital. Building on measures from Arrfelt *et al.* (2013), we created two such measures in the current study—overinvestment and underinvestment. Overinvestment is defined as the allocation of high levels of capital to business units with relatively poor risk-adjusted prospects for future growth, while underinvestment is the allocation of low levels of capital to business units with relatively higher risk-adjusted growth prospects. Based on both business unit prospects and actual allocations, over- and underinvestment together represent clear and unambiguous instances of inappropriate investment across business units.

Reflecting how the capital allocation process is a forward-looking decision process tied to expectations of future performance, we require a forward-looking measure of business unit growth prospects. Following prior research (e.g., Berger and Ofek, 1995; David, Yoshikawa, and Chari, 2006; Lang and Stulz, 1994; Maksimovic and Phillips, 2002; Rajan *et al.*, 2000), prospects are measured using Tobin's q. This measure is preferred over stock returns or accounting performance measures, first, because it is forward looking as opposed to *ex post* measures such as ROA, and, second, because "no risk adjustment or normalization is required in order to compare values across firms" (Lang and Stulz, 1994: 1249). In other words, because Tobin's q is the market value divided by the replacement cost of the firm's assets, q implicitly incorporates the correct risk-adjusted discount rate as well as minimizes other "distortions due to tax laws and accounting conventions" (Montgomery and Wernerfelt, 1988: 627). Thus, no additional adjustments are necessary to compare business units with different individual risk levels.

Since a business unit q cannot be observed directly because only the parent and not individual business units issue stock in capital markets, we estimate it by looking at the q of the particular industry that the business unit belongs to. In line with LeBaron and Speidell's (1987) approach and the empirical study by Rajan *et al.* (2000), business unit qs are approximated by the mean q of single-business firms in the same industry at the lowest possible SIC level in which at least five single-business firms are present. Specifically, a stepwise technique following prior research (e.g.,

DOI: 10.1002/smj

Berger and Ofek, 1995; Campa and Kedia, 2002; Villalonga, 1999) is used to estimate the mean Tobin's q of at least five single-business firms by taking the ratio of firm value (defined as the value of equity plus the book value of total assets minus the book value of equity) to total assets for the specified number of single-business firms at the four-digit level, and, if insufficient data are available, at the three-digit level, and, finally, at the two-digit SIC level if data are insufficient at the previous two levels.

Business units are then classified as having strong or weak prospects depending on whether their industry Tobin's q values exceed or fall short of a reference point. To distinguish strong from weak business prospects, prior research on capital allocation has used different cut-off values, including the median and the 75th percentile of Tobin's q measured across all business units in the study for each year but excluding the focal unit (e.g., Berger and Ofek, 1995; Shin and Stulz, 1998). In this study, we elected to delineate between strong and weak prospects by only using the top and bottom 40 percent of business unit prospects. Thus, business units having q values above the 60th percentile are classified as having strong prospects, while business units having q values below the 40th percentile are classified as having weak prospects. Strong prospect business units have an average q of 2.89 while weak prospect business units have a much lower average q of 1.26. This stricter classification avoids the possibility that minimal differences in prospects between units close to the median lead to differential classification. Tests with different reference points (median and the 70th and 30th percentiles) leave our results unchanged.

Since each unit in our sample either receives over- or underinvestment and since some units report fewer years of data, the two subsamples are not identical. We report 4,863 high prospect business unit years and 7,687 low prospect business unit years of observations. Next, we calculate the degree of overinvestment for business units classified as having weak prospects, and the degree of underinvestment for units having strong prospects. While it may be possible to overinvest in strong prospect business units, or underinvest in weak business units, determining whether an investment is truly too much or too little in these circumstances presupposes an optimal investment against which actual investment could be compared. Determining such optimal levels of investment for each business unit goes beyond the scope of this study. Ultimately, therefore, focusing on overinvestment in businesses with weak prospects and on underinvestment in businesses with strong prospects provides a stronger and less ambiguous test of the underlying theory.

We calculate *overinvestment* by first comparing the amount of scaled capital expenditures in a business unit with weak prospects against the average scaled expenditure in all business units in our sample that have strong prospects. Capital expenditures in a poor business that are greater than the average expenditure in stronger businesses are classified as overinvestment. However, because scaled capital expenditures for a business unit may be tied to the capital intensity of the business unit's industry, we regressed the sum of the above calculation on industry capital intensity and on what we deemed to be relevant controls (cost of capital, size, and industry ROA), saving residuals to represent overinvestment. Conversely, we first compare the amount of scaled capital expenditures in business units with strong prospects against the average investment in all businesses with weak prospects based on the logic that capital expenditures in a strong prospect business should not be lower than the average investment in weaker business units. We then calculate residuals, representing underinvestment, following the same approach as with overinvestment. Alternative approaches to control for industry capital intensity, including directly adjusting measures of over- and underinvestment by the capital intensity of the industry, did not change our results. All measures are scaled by business unit size and constructed so that increasing numbers represent higher levels of both over- and underinvestment, reflecting the entire spectrum of misallocation.

The use of a more conceptually complete measure of allocation competency that captures both overinvestment and underinvestment differentiates this study from previous studies investigating diversification discounts[4] (e.g., Lang and Stulz, 1994; Servaes, 1996) as well as the linkage between overinvestment and firm performance (e.g., Berger and Ofek, 1995).

Market fragmentation

Market fragmentation (MF) is operationalized using the Herfindahl index (Herfindahl, 1950;

[4] Diversification discounts are differences between the value of diversified firms and their hypothetical value if all their business units were instead treated as freestanding units.

DOI: 10.1002/smj

Kelly, 1951) and accounts for organizational environments exuding different degrees of competition based on the homogeneity and concentration of firms in that particular environment or industry (cf., Ferrier, 2001). Thus, following Boyd (1990, 1995), the Herfindahl index (H) takes into account both the number of firms in an industry, as well as inequalities in market shares among those firms. It is calculated as:

$$\mathrm{H_j} = 1 - \left(market\ share_j\right)^2$$

where $j = 1, 2, \ldots n,$ represents the number of firms in the industry and $market\ share_j$ is the market share for that particular firm.

Unrelated diversification

Unrelated diversification (DIV) measures the degree of unrelatedness among diversified firms (e.g., Hill, 1988). It is operationalized using the entropy measure of unrelated diversification (Jacquemin and Berry, 1979) and is calculated based on each firm's share of industry sales according to the following formula:

$$Unrelated\ entropy = \sum_{i=1}^{N} P_i \ln\left(1/P_i\right)$$

where P_i is defined as the proportion of firm sales in SIC code i for a firm with N different two-digit SIC business units.

Controls

Cost of debt capital

Cost of debt capital reflects the overall cost of debt capital. Jensen (1991, 1993) argued that firms with access to cheap and ample capital tend to waste a large portion of that capital on low-yielding investment. Therefore, to control for the possibility that firms with a lower funding cost may pursue more inappropriate capital allocation strategies because of their presumably larger pools of investment capital to draw from, we included the weighted average cost of debt capital for each firm calculated as total interest rate expense of short- and long-term debt divided by long-term debt and the part of short-term liabilities constituting debt.

R&D intensity

R&D intensity is measured by dividing research and development expenditures by firm sales. This variable was included because higher research intensity has been shown to increase information asymmetries in organizations (Aboody and Lev, 2000) and could therefore make the capital allocation decision more complicated by increasing discrepancies in the amount and quality of available information at different levels in the organization. For example, discrepancies may occur between information available to corporate managers responsible for allocating scarce capital and information available at the business unit level, potentially leading to additional instances of over- and underinvestment. Thus, controlling for R&D intensity limits the possibility of biasing our results.

Growth capability

We indirectly control for a business unit's capability-building resources by using its relative growth rate as a proxy for growth capability. Strong performance at the business unit level suggests the possibility that a business unit may have an advantage in its particular industry, reflecting distinct firm-level and business unit level resources (Brush, 1996; Demsetz, 1974; Rumelt and Wensley, 1981). In particular, high growth at the business unit level may be due to existing capability-building resources in firm and individual business units (Makadok, 2001), viewed as embedded organizational processes or systems that help the firm to improve the productivity of other firm and business unit resources (Teece, Pisano, and Shuen, 1997). Therefore, and because our measure of growth prospects focuses on external opportunities available to all businesses in a given industry, we control for business unit growth capability using relative sales growth based on the logic that, within a particular industry, business units exhibiting exceptional sales growth must have corresponding resources that enable such performance advantages. Thus, as a proxy for firm and business level resources leading to business level growth capabilities, we measure two-year business unit sales growth relative to industry peers by comparing focal business unit sales growth with the average growth of all business units in the same industry as the focal unit for each year. Similar to calculating business unit prospects, we calculate average sales growth only when there are at least five rival business units in the same industry and employ a stepwise procedure (beginning with the narrowest four-digit industry classification) to

DOI: 10.1002/smj

adjust industry classification as necessary to satisfy this criterion.

Industry capital expenditure intensity

Industry capital expenditure intensity (ICAPEX) is used to control for the possibility that instances of over- and underinvestment are driven by the degree of capital intensity of the industry. Including this control allows us to apply our measures of over- and underinvestment across our multi-industry sample.[5] To calculate this control variable, we use the stepwise procedure to determine average capital expenditure intensity (capital expenditures scaled by business unit size) at the narrowest industry classification possible where there are at least five rival business units.

Industry ROA

Industry ROA (IROA) controls for the possibility that there may be systematic differences in returns across business units experiencing over- and underinvestment. This could, for example, be the case if corporate managers systematically increase investment in response to poor performance and limit investment in response to good performance. Previously mentioned stepwise procedure is used to calculate this control variable.

Organizational size

Organizational size is measured as the log of firm revenue and was included because it can affect firm resource allocations (Haveman, 1993). Finally, we included industry and year dummies to control for industry- and time-specific influences, respectively.

Model specification and estimation

We use a multilevel modeling approach (Bruk and Raudenbush, 1992; McNamara, Deephouse, and Luce, 2003; Raudenbush *et al.*, 2000) and the statistical program STATA XT Mixed to test our model for several reasons. First, modeling the corporate effect on business unit performance requires a multilevel approach because multilevel modeling takes into account a number of dependencies that occur between industries, corporations, and business units (Misangyi *et al.*, 2006). To model this nested structure, we follow Misangyi *et al.* (2006) and assign time to the first level followed by stable business unit and corporate effects with industry effects accounted for by entering industry dummies at the business unit level.

Second, a multilevel approach enables inferences about the importance of strategy that previous single-level methods could not provide (Misangyi *et al.*, 2006). Specifically, STATA XT Mixed allows us to investigate how allocation competency leads to a corporate effect on business unit performance, thereby offering information about how the degree of allocation competency is associated with superior performance.

Finally, STATA XT Mixed allows us to separate information varying over time from cross-sectional information. To enable this separation, we determined whether explanatory as well as control variables should enter the model as transient or stable effects. This was done using intraclass correlation (ICC) analysis to estimate transient and stable variance for each individual measure (Table 1). Over and underinvestment, cost of debt

Table 1. Intraclass correlations (ICC) of relevant variables

Variable	ICC (1)	ICC (2)	Enter as
1. Business unit ROA	0.10		Transient
2. Overinvestment	0.11		Transient
3. Underinvestment	0.19		Transient
4. Market fragmentation	0.21		Transient
5. Unrelated diversification	0.86	0.98	Stable
6. Cost of debt capital	0.22		Transient
7. Organization size (logged)	0.97	0.99	Stable
8. R&D intensity	0.90	0.99	Stable
9. Growth capability	0.00		Transient
10. Industry capital expenditure intensity	0.15		Transient
11. Industry ROA	0.50		Transient

[5] We also ran a split-sample analysis where we separately modeled industries with above and below average levels of capital intensity, and found that the negative effect of overinvestment on business unit ROA held across both subsamples. In addition, we conducted a supplemental analysis in which we included an interaction term for overinvestment × industry average capital intensity, and found that the interaction effect was not significant. Thus, both tests suggest that our results are robust between low and high capital intensive industries.

capital, growth capability, ICAPEX, IROA, as well as MF varied significantly over time and will therefore be introduced at the first level (*time level*) since they are more likely to explain business unit ROA over time. Conversely, firm size, R&D intensity, and level of diversification, mainly varying across firms, will be aggregated and introduced as stable effects at the *corporate level*. STATA incorporates a test that allows us to determine if any of the time level relationships with business unit ROA vary randomly across higher-level units. Based on this test, the slopes of industry ROA and growth capability varied significantly across the business unit and corporate levels for the overinvestment model and were modeled as random slopes at those levels (nonsignificant slopes not shown for brevity). Industry ROA and underinvestment varied significantly across the business unit while only industry ROA varied across the corporate level for the underinvestment model. The final model allowing for tests of each prediction as follows:

$$\begin{aligned}
\textit{Bus. Unit ROA}_{tij} = {} & \pi_{0ij} + \pi_{1ij}\,(\text{Cost})_{\text{t-1ij}} \\
& + \pi_{2ij}\,(\text{ICAPEX})_{\text{t-1ij}} + \pi_{3ij}\,(\text{IROA})_{\text{t-1ij}} \\
& + \pi_{4ij}\,(\text{Growth capability})_{\text{t-1ij}} \\
& + \pi_{5}\,(\text{Year dummies})_{\text{t-1}} \\
& + \pi_{6ij}\,(\text{Over/Underinvestment})_{\text{t-1ij}} \\
& + \pi_{7ij}\,(\text{MF})_{\text{t-1ij}} \\
& + \pi_{8ij}\,(\text{Over/Underinvestment} \times \text{MF})_{\text{t-1ij}} \\
& + \pi_{9ij}\,(\text{Over/Underinvestment} \times \text{DIV})_{\text{t-1ij}} \\
& + e_{t-1ij}
\end{aligned}$$

$$\pi_{0ij} = \beta_{00j} + \beta_{1}\,(\text{Industry dummies}) + r_{ij}$$

$$\pi_{3ij} = \beta_{30j} + r_{3ij}$$

$$\pi_{4ij} = \beta_{40j} + r_{4ij}$$

$$\pi_{6ij} = \beta_{60j} + r_{6ij}$$

$$\begin{aligned}
\beta_{00j} = {} & \gamma_{000} + \gamma_{001}\,(\text{Size})_{\text{j}} + \gamma_{002}\,(\text{R\&DINT})_{\text{j}} \\
& + \gamma_{003}\,(\text{DIV})_{\text{j}} + \mu_{j}
\end{aligned}$$

$$\beta_{30j} = \gamma_{300} + \mu_{30j}$$

$$\beta_{40j} = \gamma_{400} + \mu_{40j}$$

Furthermore, time lags are specified using the logic that causal inferences require predictors to be lagged relative to dependent variables unless the effect is instantaneous. It is likely that misallocations of capital have lagged effects on performance outcomes. That is, effects of "too much" capital invested in low prospect business units and "not enough" capital invested in high prospect business units will gradually feed through to performance from the time the allocations are made and until new allocations are implemented in the next time period. Therefore, over- and underinvestment, market fragmentation, unrelated diversification, interactions, and control variables enter the model in the year prior to the outcome variable.

RESULTS

Table 2 presents means and variance as well as correlations among raw variables.

Table 3 provides results testing the association between overinvestment and business unit performance. Among control variables, organization size ($b = 0.007$, $p < 0.05$) and industry average ROA ($b = 0.387$, $p < 0.001$) are significant, suggesting that larger firms and firms in more profitable industries tend to have more profitable business units. Note that our control for capability-building resources (growth capability) is nonsignificant, suggesting that capability-building effects fail to increase business unit returns in this study.

Hypothesis 1 predicts a negative association between overinvestment and business unit ROA. The result from this test is presented in Model 2 and is significant in the predicted direction ($b = -0.083$; $p < 0.01$). Thus, Hypothesis 1 is supported.

Hypothesis 3a, predicting a moderating effect of market competition, is also supported (Model 3: $b = -0.096$; $p < 0.05$). That is, as markets become more competitive, the effect of capital allocation errors on business unit performance becomes more severe. Finally, Hypothesis 4a, predicting a moderating effect of unrelated firm diversification on the association between overinvestment and business unit ROA, is not supported.

Table 4 provides results testing the association between underinvestment and business unit performance. Hypothesis 2 predicts that underinvestment exhibits a negative effect on business unit ROA, but we found no support for this hypothesis. Hypotheses 3b and 4b, predicting moderating

DOI: 10.1002/smj

Table 2. Descriptive statistics and correlations*

Variable	Mean	*S.D.*	1	2	3	4	5	6	7	8	9	10
1. Business unit ROA	0.13	0.61										
2. Overinvestment	0.00	0.12	−0.04									
3. Underinvestment	0.00	0.13	−0.04	n/a								
4. Market fragmentation	0.20	0.21	−0.02	−0.06	0.02							
5. Cost of debt capital	0.13	0.77	0.00	0.00	0.00	0.02						
6. Organization size (logged)	7.3	1.7	0.04	0.08	−0.02	−0.02	−0.04					
7. R&D intensity	0.04	0.09	−0.00	−0.01	−0.00	−0.09	0.00	−0.10				
8. Unrelated diversification	0.46	0.59	−0.00	0.04	0.00	0.05	−0.02	0.37	−0.08			
9. Growth capability	0.01	5.61	0.00	−0.00	−0.00	0.00	0.00	−0.01	0.02	−0.01		
10. Industry capital expenditure intensity	0.07	0.08	−0.00	−0.00	−0.14	−0.05	−0.01	0.07	−0.04	0.02	0.00	
11. Industry ROA	0.09	0.15	0.16	−0.01	−0.11	0.05	0.00	0.08	−0.11	0.04	0.00	0.07

* Correlations 0.03 and above are significant at the 0.05 level

effects of the level of market competition and unrelated firm diversification, respectively, were also not supported.

DISCUSSION

We have argued and empirically demonstrated the role of a corporate effect on business unit performance. Our innovative approach to examining the role of the corporate effect disentangles two possible investment errors that the corporate office may make in allocating capital across business units: overinvestment in businesses that have relatively weak growth prospects and underinvestment in businesses with relatively strong growth prospects. Examining capital allocation across business units by the corporate office provides a direct measure of the importance of the corporate office since misallocation across business units, as we have shown here, directly influences business unit and, by extension, firm level performance. We also find that this effect varies with the nature of the misallocation and that the effect on performance is moderated by certain contextual conditions. We also provide evidence to suggest that capital allocation may be better characterized as resource picking rather than as capability building.

We find strong support for our prediction that overinvesting in business units located in industries with weak return prospects harms business unit performance. Stronger investment by the corporate office in business units operating in poor industries is likely to undermine business unit performance more than it will improve that performance. This may occur if the marginal return on investment in a low growth industry is negative. If so, then each additional increment of investment should correspond to decreasing average returns, driving down returns further. In addition, allocating capital to poor prospect business units is likely to increase the units' assets without providing a commensurate increase in unit returns. In sum, the corporate office, in performing one of its core functions of resource allocation, can have a serious, maybe even detrimental impact on unit and ultimately firm performance. Though prior research has clearly demonstrated a role for the corporate office in business unit performance, our study shows that this influence can be harmful as well as beneficial to that performance.

In contrast to overinvestment, we failed to find an effect of underinvestment on business unit performance. One explanation may be that underinvestment has a more indirect effect on business unit returns than overinvestment. For example, managers of units with strong growth prospects may be able to compensate for reduced investment by forming alliance partnerships to gain access to the necessary resources. Alternatively, underinvestment may also be tied to overinvestment in other units. That is, overinvestment may incorporate some of the effects of underinvestment because, in a capital constrained corporate environment, overinvestment in one unit may lead to underinvestment in another. Therefore, underinvestment may not have an independent effect on business unit performance beyond being the victim of having resources diverted away toward other units. Alternatively, it may be that the effect of underinvestment only occurs under certain

DOI: 10.1002/smj

Table 3. Performance implications of overinvestment[a]

Model	1	2	3	4
Cost of debt capital	0.004	0.004	0.004	0.004
	(0.003)	(0.003)	(0.003)	(0.003)
Organization size (logged)	0.007*	0.009**	0.009**	0.009**
	(0.003)	(0.003)	(0.003)	(0.003)
R&D intensity	−0.258	−0.323^	−0.322^	−0.323^
	(0.158)	(0.177)	(0.177)	(0.177)
Industry capital expenditure intensity	−0.020	−0.027*	−0.025^	−0.028*
	(0.013)	(0.013)	(0.013)	(0.014)
Industry ROA	0.387***	0.385***	0.383***	0.384***
	(0.044)	(0.044)	(0.044)	(0.044)
Growth capability	0.002	0.002	0.002	0.002
	(0.005)	(0.005)	(0.005)	(0.005)
Market fragmentation (MF)	−0.015	−0.006	−0.001	−0.006
	(0.028)	(0.029)	(0.029)	(0.029)
Unrelated diversification (DIV)	−0.001	−0.001	−0.002	−0.002
	(0.009)	(0.010)	(0.010)	(0.010)
Overinvestment		−0.083**	−0.061*	−0.090**
		(0.029)	(0.031)	(0.030)
Overinvestment × MF			−0.096*	
			(0.043)	
Overinvestment × DIV				−0.019
				(0.020)
Intercept	0.030	−0.047	−0.047	−0.051
Wald χ^2	185.63	249.11	254.47	250.13
Prob > χ^2	0.00	0.00	0.00	0.00
N	7687	7687	7687	7687
Variance components				
Time level (e_{tij})	0.01907	0.01899	0.01897	0.01900
Business unit level (r_{ij})	0.05339	0.05293	0.05300	0.05288
Growth capability (slope)	0.00924	0.00966	0.00971	0.00965
Industry ROA (slope)	0.75588	0.74773	0.74267	0.74729
Corporate level (μ_j)	0.00197	0.00145	0.00146	0.00145
Growth capability (slope)	0.00000	0.00000	0.00000	0.00000
Industry ROA (slope)	0.02072	0.00319	0.00299	0.00246

[a] Year and industry dummies are included in all models. Mostly nonsignificant coefficients are not reported for brevity.
[b] ^ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

conditions. For example, it would seem likely that underinvestment is more likely to affect unit performance in highly competitive environments where failure to maintain investment parity with rival firms would put the business unit at a competitive disadvantage.

Although this relationship was not borne out in our main interaction analysis, it may be that the effect is nonlinear and triggered only at a certain level of competitiveness. To test this idea, we performed an additional test in which we categorized markets into low and high levels of competition using different splits to check the robustness of this categorization. Specifically, we created samples that only included business units competing in industries with a high level of competition (market competition above 40th and 50th percentiles, respectively). Categorizing our sample into subsamples recognizes the possibility that over-predicted and under-predicted groups may exist within the overall sample (Zedeck, 1971), thus the effect may be more easily identifiable by breaking down the data into interval groups. This also recognizes that the criterion of interest, underinvestment, may only exhibit a relationship with performance over a defined range of the conditional variable, market competition (Brambor, Clark, and Golder, 2006). Estimating the model of underinvestment using these samples finds that underinvestment does matter but only

DOI: 10.1002/smj

Table 4. Performance implications of underinvestment[a]

Model	1	2	3	4
Cost of debt capital	0.005	0.005	0.005	0.005
	(0.014)	(0.014)	(0.014)	(0.014)
Organization size (logged)	0.023**	0.023**	0.024**	0.023**
	(0.007)	(0.007)	(0.007)	(0.007)
R&D intensity	−0.009	−0.008	−0.013	−0.009
	(0.147)	(0.147)	(0.147)	(0.147)
Industry capital expenditure intensity	−1.08*	−0.950*	−0.918^	−0.968*
	(0.475)	(0.483)	(0.484)	(0.491)
Industry ROA	0.177^	0.180^	0.178^	0.180^
	(0.104)	(0.104)	(0.104)	(0.104)
Growth capability	0.000	0.000	0.000	0.000
	(0.007)	(0.007)	(0.007)	(0.007)
Market fragmentation (MF)	−0.119	−0.114	−0.074	−0.114
	(0.099)	(0.099)	(0.109)	(0.099)
Unrelated diversification (DIV)	0.030	0.029	0.030	0.028
	(0.025)	(0.025)	(0.025)	(0.026)
Underinvestment		−0.313	−0.391^	−0.298
		(0.219)	(0.236)	(0.231)
Underinvestment × MF			0.738	
			(0.846)	
Underinvestment × DIV				0.071
				(0.35)
Intercept	0.198	0.179	0.168	0.175
Wald χ^2	105.21	107.54	108.31	107.57
Prob > χ^2	0.00	0.00	0.00	0.00
N	4863	4863	4863	4863
Variance components				
Time level (e_{tij})	0.34020	0.34024	0.34019	0.34025
Business unit level (r_{ij})	0.01004	0.01031	0.01029	0.01028
Industry ROA (slope)	0.0000	0.00000	0.00000	0.00000
Underinvestment (slope)	5.3183	5.2317	5.2274	5.2371
Corporate level (μ_j)	0.02649	0.02603	0.02607	0.02604
Industry ROA (slope)	0.23921	0.23839	0.23841	0.23838

[a] Year and industry dummies are included in all models. Mostly nonsignificant coefficients are not reported for brevity.
[b] ^ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

in highly competitive markets, suggesting that our core argument, that underinvested units would suffer since they would not be able to exploit growth opportunities and position themselves as well as more fully capitalized competitors, is correct. However, this effect only occurs for firms facing elevated levels of market competition and may not materialize if competitors do not exploit the opportunities well or act aggressively against the underinvested unit, which competitors may not be able to do or may not be compelled to do in less competitive markets. Overall, the effect of underinvestment seems to be tied to market structure and the level of market competition to a much larger extent than we anticipated and may therefore be more muted and take longer to materialize for firms with business units in less competitive markets.

Beyond examining direct effects of corporate misallocation on performance, we also examined two contextual factors, market competition and degree of firm diversification, which have been argued to influence the nature of capital allocation within multibusiness firms. This responds to calls to investigate how the broad effects (industry, corporate, and business unit) and, in particular, how specific strategic factors within and between each class of effects interact and depend on each other (e.g., McGahan and Porter, 2002; Misangyi *et al.,* 2006). That is, we know from variance decomposition studies that the broad effects are not independent of each other—that they likely "vary together"

DOI: 10.1002/smj

and are "simultaneously determined" (McGahan and Porter, 2002: 848)—but we are less sure exactly how that is reflected in strategic factors within and between the broad effects. This study could be viewed as a step in that direction by examining how a corporate capability, capital allocation, is affected by market competition and degree of firm diversification.

Our results indicate that, where market competition is highest, capital investment errors have the strongest negative effect on performance. This finding is critical to understanding the effect of allocation competency in different industry environments—more competitive industry environments likely magnify negative consequences of poor allocation. This is true for overinvestment where committing additional resources to units with poor prospects is unlikely to result in improved performance. In addition, as noted above, the negative effect of underinvestment on performance only appears when markets are highly competitive. Therefore, we conclude that, as firms operate in more competitive environments, capital allocation competency plays an increasingly important role in business unit and, by extension, firm performance. Put differently, capital misallocation is likely to create the greatest damage to business unit performance precisely when business units need corporate assistance the most. This conclusion emphasizes how dependent the performance implications of a given strategic action are on the firm's particular context or environment. For example, a strategic error, such as misallocation of capital, may be more pervasive with more intense performance implications under certain conditions and environments than in others.

At the same time, we do not find that the degree of unrelated firm diversification moderates the association between allocation competency and business unit performance, indicating that the effect of allocation competency on performance does not vary with the degree of unrelated diversification. This finding appears inconsistent with previous work (e.g., Hill, 1988; Hill *et al.*, 1992) and with our argument that one of the primary roles of the corporate office in unrelatedly diversified firms is to effectively control and distribute corporate financial assets. However, it appears that this effect also is dependent on market structure. When we restricted our sample to firms and business units competing in more competitive markets, we found a significant moderating effect. This suggests that more narrowly diversified firms, as long as they are subject to elevated market competition, may in fact not benefit as much from objective, rational capital allocation systems since the competition for financial resources within the same corporate umbrella may lead to reduced interdivisional coordination and benefits from synergistic sharing of resources and skills that are important in these firms.

Overall, it may be that the contingency perspective (e.g., Donaldson, 2001) is the best way to extend research on firm strategic actions and their performance implications both within and across the broader overall industry, corporate, and business unit effects. Not incorporating context and environmental contingencies that may alter effects of strategic actions across corporations may bias results by providing a much more simplified, less realistic, and probably incorrect view of how strategy works in modern corporations. We therefore view this as a very exciting and promising space for future research. Although we focused on how a single corporate strategic action may have different performance implications across two different contingency contexts at two different levels, one can imagine how strategic factors at all three levels may ultimately interact to affect business unit and ultimately firm performance. Clearly, the bias in strategic management research toward examining firm level performance has left a void in our understanding of business unit performance. Our results suggest that this performance results from the interactions of firm and industry characteristics, which have largely been overlooked in prior research.

Limitations

Our measure of how well managers allocate capital limited our sample size and likely oversimplified what is surely a more complex process. Given the relative lack of prior research to guide our efforts (as evidenced in many calls to study this and similar processes, e.g., Adner and Helfat, 2003; Misangyi *et al.,* 2006), we developed a measure of capital allocation competency that relies on external industry information and reference points to categorize investment. This approach excludes private information that corporate allocators may have about their business units and also likely limits the number of instances of over- and underinvestment that may be identified in any given sample since firms are deemed to overinvest (underinvest) in a particular business unit only if two conditions are fulfilled: (1)

DOI: 10.1002/smj

that the business unit has below the 40th percentile or above the 60th percentile prospects as measured by two distinct reference points, and (2) that the particular business unit receives more (less) capital as compared to the average investment of relatively higher (above reference point) and lower (below reference point) prospect units.[6] In addition, our measures are not sensitive to excessive investment in business units deemed to be above the higher prospect reference, nor are our measures sensitive to excessive underinvestment in units deemed to be below the lower prospect reference, which leaves out other possible instances of over- and underinvestment. Thus, our measures of capital allocation competency may be too stringent in defining over- and underinvestment, thus limiting the number of recorded allocation errors in our study. While this constraint clearly limited our sample size, it should not bias results except to make it more difficult to identify significant empirical associations. Thus, if anything, we are likely understating the impact of effective capital allocation in understanding the corporate effect since we are only capturing some of the instances of over- and underinvestment. However, future research could extend this line of inquiry by developing different measures for over- and underinvestment.

Our study did not attempt to identify the reasons for misallocations and the factors that either reinforce or reduce them, though a recent study has explored that issue (Arrfelt *et al.*, 2013). Results of that study suggest that corporate decision makers focus attention on underperforming business units relative to both internal and external referents, leading to overinvestment, but that the presence of slack may act to suppress overinvestment in those underperforming units. Other factors that may also drive or constrain capital misallocation include executive characteristics and power dynamics within the firm as well as external factors such as market dynamics and pressures from investors. Future research may also examine if capital markets play any role in disciplining poor capital allocation and rewarding good allocations by adjusting firm market values, resulting in learning and more effective future allocations.

[6] The logic underlying these measures dictates that some cutoff is used to differentiate between business units with high and low prospects. Because of the symmetry of over- and underinvestment and because we wanted to avoid that minimal differences in prospects lead to differential classification, this cutoff is at the 40th and 60th percentile for low and high prospect business units, respectively. Thus, the current cutoff is less restrictive than 25th percentile cutoff to differentiate between business units with high and low prospects used by Berger and Ofek (1995).

CONCLUSION

In conclusion, though the role of corporate strategy in firm performance has received increased attention by scholars examining the amount of variance in business unit performance that can be attributed to the corporate office, exactly how the corporate office influences performance has largely remained unclear. In this study, we shed new light on the "corporate effect" and how an important corporate factor—allocation competency—influences performance by modeling both overinvestment in poor prospect businesses and underinvestment in strong prospect businesses. We find that capital allocation competency has a strong yet complex effect on business unit performance and that market conditions increase the salience of this effect on performance.

ACKNOWLEDGEMENTS

We would like to thank Anita McGahan and our anonymous reviewers for their insightful comments and constructive suggestions.

REFERENCES

Aboody D, Lev B. 2000. Information asymmetry, R&D, and insider gains. *Journal of Finance* **55**: 2747–2766.

Adner R, Helfat CE. 2003. Corporate effects and dynamic managerial capabilities. *Strategic Management Journal* **24**: 1011–1025.

Arrfelt M, Wiseman RM, Hult T. 2013. Looking backward instead of forward: aspiration-driven influences on the efficiency of the capital allocation process. *Academy of Management Journal* **56**: 1081–1103.

Barnard CI. 1938. *The Functions of the Executive*. Harvard University Press: Cambridge, MA.

Berger P, Ofek E. 1995. Diversification effects on firm value. *Journal of Financial Economics* **44**: 39–65.

Bowman EH, Helfat CE. 2001. Does corporate strategy matter? *Strategic Management Journal* **22**: 1–23.

Boyd BK. 1990. Corporate linkages and organizational environment: a test of the resource dependence model. *Strategic Management Journal* **11**: 419–430.

Boyd BK. 1995. CEO duality and firm performance: a contingency model. *Strategic Management Journal* **16**: 301–312.

Brambor T, Clark WR, Golder M. 2006. Understanding interaction models: improving empirical analyses. *Political Analysis* **14**: 63–82.

Bruk AS, Raudenbush SW. 1992. *Hierarchical Linear Models*. Sage: Newbury Park, CA.

Brush TH. 1996. Predicted change in operational synergy and post-acquisition performance of acquired businesses. *Strategic Management Journal* **17**: 1–24.

Brush TH, Bromiley P, Hendrickx M. 1999. The relative influence of industry and corporation on business segment performance: an alternative estimate. *Strategic Management Journal* **88**: 109–133.

Campa JM, Kedia S. 2002. Explaining the diversification discount. *Journal of Finance* **57**: 1731–1762.

Chandler A. 1962. *Strategy and Structure: Chapters in the History of American Industrial Enterprise*. MIT Press: Cambridge, MA.

Chatterjee A, Hambrick DC. 2007. It's all about me: Narcissistic chief executive officers and their effects on company strategy and performance. *Administrative Science Quarterly* **52**: 351–386.

Cyert RM, March JG. 1963. *A Behavioral Theory of the Firm*. Prentice-Hall: Englewood Cliffs, NJ.

David P, Yoshikawa T, Chari MDR. 2006. Strategic investments in Japanese corporations: do foreign portfolio owners foster underinvestment or appropriate investment? *Strategic Management Journal* **27**: 591–600.

Demsetz H. 1974. Industry structure, market rivalry and public policy. *Journal of Law and Economics* **16**: 1–9.

Donaldson L. 2001. *The Contingency Theory of Organizations*. Sage: Thousand Oaks, CA.

FASB (Financial Accounting Standards Board). 1997. Disclosures about Segments of an Enterprise and Related Information. Statement of Financial Accounting Standards No. 131. FASB: Norwalk, CT.

Ferrier WJ. 2001. Navigating the competitive landscape: the drivers and consequences of competitive aggressiveness. *Academy of Management Journal* **44**: 858–877.

Ferrier WJ, Smith KG, Grimm CM. 1999. The role of competitive action in market share erosion and industry dethronement: a study of industry leaders and challengers. *Academy of Management Journal* **42**: 372–388.

Gavetti G, Levinthal D. 2000. Looking forward and looking backward: cognitive and experiential search. *Administrative Science Quarterly* **45**: 113–137.

Haveman HA. 1993. Organizational size and change: diversification in the savings and loan industry after deregulation. *Administrative Science Quarterly* **38**: 20–50.

Hayward MLA, Hambrick DC. 1997. Explaining the premiums paid for large acquisitions: evidence of CEO Hubris. *Administrative Science Quarterly* **42**: 103–127.

Helfat CE, Finkelstein S, Mitchell W, Peteraf MA, Singh H, Teece DJ, Winter SG. 2007. *Dynamic Capabilities: Understanding Strategic Change in Organizations*. Blackwell: Malden, MA.

Herfindahl OC. 1950. Concentration in the steel industry. Unpublished PhD diss., Columbia University: New York.

Hill CWL. 1988. Internal capital market controls and financial performance in multidivisional firms. *Journal of Industrial Economics* **37**: 67–83.

Hill CWL, Hitt MA, Hoskisson RE. 1992. Cooperative versus competitive structures in related and unrelated diversified firms. *Organization Science* **3**: 501–521.

Hough JR. 2006. Business segment performance redux: a multilevel approach. *Strategic Management Journal* **27**: 45–61.

Jacquemin AP, Berry CH. 1979. Entropy measure of diversification and corporate growth. *Journal of Industrial Economics* **4**: 359–369.

Jensen MC. 1991. Corporate control and the politics of finance. *Journal of Applied Corporate Finance* **4**: 13–33.

Jensen MC. 1993. The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance* **48**: 831–880.

Jensen MC, Meckling WH. 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* **3**: 305–360.

Kahneman D, Lavallo D. 1993. Timid choices and bold forecasts: a cognitive perspective on risk taking. *Management Science* **39**: 17–31.

Kelly WA. 1951. A generalized interpretation of the Herfindahl index. *Southern Economic Journal* **48**: 50–57.

Lang L, Stulz R. 1994. Tobin's q, corporate diversification, and firm performance. *Journal of Political Economy* **102**: 1248–1280.

LeBaron D, Speidell LS. 1987. Why are the parts worth more than the sum? Chop Shop, a corporate valuation model. In *The Merger Boom*, Conference Series, No. 31, Brown LE, Rosengren ES (eds). Federal Reserve Bank: Boston, MA; 78–95.

Makadok R. 2001. Toward a synthesis of the resource-based and dynamic-capability views of rent creation. *Strategic Management Journal* **22**: 387–401.

Maksimovic V, Phillips G. 2002. Do conglomerate firms allocate resources inefficiently across industries? Theory and evidence. *Journal of Finance* **2**: 721–767.

Maritan CA. 2001. Capital investment as investing in organizational capabilities: an empirical grounded process model. *Academy of Management Journal* **44**: 513–522.

McGahan A, Porter M. 1997. How much does industry matter, really? *Strategic Management Journal*, Summer Special Issue **18**: 15–30.

McGahan A, Porter M. 2002. What do we know about variance in accounting profitability? *Management Science* **48**: 834–851.

McGahan A, Porter M. 2005. Comment on 'industry, corporate and business-segment effects and business performance: a non-parametric approach' by Ruefli and Wiggins. *Strategic Management Journal* **26**: 873–880.

McNamara G, Deephouse DL, Luce RA. 2003. Competitive positioning within and across a strategic group structure: the performance of core, secondary and solitary firms. *Strategic Management Journal* **2**: 161–181.

Miller D, Chen MJ. 1994. Sources and consequences of competitive inertia: a study of the U.S. airline industry. *Administrative Science Quarterly* **39**: 1–23.

Misangyi VF, Elms H, Greckhamer T, LePine JA. 2006. A new perspective on a fundamental debate: a multilevel approach to industry, corporate, and business unit effects. *Strategic Management Journal* **27**: 571–590.

Montgomery CA, Wernerfelt B. 1988. Diversification, Ricardian rents, and Tobin's q. *Journal of Economics* **19**: 623–632.

Porter ME. 1987. From competitive advantage to corporate strategy. *Harvard Business Review* **65**(3): 43–59.

Rajan R, Servaes H, Zingales L. 2000. The cost of diversity: the diversification discount and inefficent investment. *Journal of Finance* **1**: 35–80.

Raudenbush SW, Bruk AS, Cheong AF, Congdon R. 2000. *HLM5: Hierarchical Linear and Nonlinear Modeling*. Scientific Software International: Lincolnwood, IL.

Roquebert J, Phillips R, Westfall P. 1996. Market versus management: what drives profitability? *Strategic Management Journal* **17**: 653–664.

Rumelt R. 1991. How much does industry matter? *Strategic Management Journal* **12**: 167–185.

Rumelt R, Wensley R. 1981. In search of market share effects. In *Academy of Management Annual Meetings and Proceedings*. San Diego, California.

Scherer F, Ross D. 1990. *Industrial Market Structure and Economic Performance*. Harvard University Press: Boston, MA.

Servaes H. 1996. The value of diversification during the conglomerate merger wave. *Journal of Finance* **51**: 1201–1225.

Shin H, Stulz R. 1998. Are internal capital markets efficient? *Quarterly Journal of Economics* **113**: 531–553.

Sirmon DG, Hitt MA. 2009. Contingencies within dynamic managerial capabilities: interdependent effects of resource investment and deployment on firm performance. *Strategic Management Journal* **13**: 1375–1394.

Sirmon DG, Hitt MA, Ireland RD. 2007. Managing firm resources in dynamic environments to create value: looking inside the black box. *Academy of Management Review* **32**: 273–292.

Skinner DJ, Sloan RG. 2003. Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio. *Review of Accounting Studies* **7**: 289–312.

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

Stein JC. 1997. Internal capital markets and the competition for corporate resources. *Journal of Finance* **1**: 111–133.

Teece DJ, Pisano G, Shuen A. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal* **18**: 509–533.

Villalonga B. 1999. Does diversification cause the 'diversification discount'? Unpublished Working paper, University of California, Los Angeles, CA.

Williamson OE. 1975. *Markets and Hierarchies: Analysis and Antitrust Implications*. Free Press: New York.

Young G, Smith KG, Grimm CM. 1996. "Austrian" and industrial organization perspectives on firm-level competitive activity and performance. *Organization Science* **7**: 243–254.

Zedeck S. 1971. Problems with the use of "moderator" variables. *Psychological Bulletin* **76**: 295–310.