CONTINGENCIES WITHIN DYNAMIC MANAGERIAL CAPABILITIES: INTERDEPENDENT EFFECTS OF RESOURCE INVESTMENT AND DEPLOYMENT ON FIRM PERFORMANCE

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Dynamic managerial capabilities focus on managers' resource-related decisions. Asset orchestration, a central component of dynamic managerial capabilities and of resource management, highlights the importance of integrating (matching) resource investment and deployment decisions. Building on these recent theoretical advances, we examine the contingent nature of resource investment and deployment decisions. The results, based on a sample of banking firms, indicate that firm performance suffers when managers' investment decisions deviate from the norms of rivals for both human and physical capital. However, when deployment decisions support investment decisions, greater investment deviation, both high and low, generally enhances performance. Specifically, firm performance is optimized by making congruent resource investment and deployment decisions as opposed to maximizing or economizing either decision independently. Therefore, resource management via asset orchestration is vital for superior performance. Copyright © 2009 John Wiley & Sons, Ltd.

INTRODUCTION

The performance effects of strategic resources (Barney and Arikan, 2001; Crook *et al.*, 2008), highlight the need to understand how managers effectively utilize these resources (Hansen, Perry, and Reese, 2004; Mahoney and Pandian, 1992; Sirmon, Hitt, and Ireland, 2007). Building on earlier work on dynamic capabilities (e.g., Teece, Pisano, and Shuen, 1997), Adner and Helfat introduced the concept of 'dynamic managerial capabilities,' highlighting the importance of managers' strategic decisions to 'build, integrate, and reconfigure

organizational resources and competences' (Adner and Helfat, 2003: 1012). And indeed, empirical research indicates that dimensions of dynamic managerial capabilities affect performance (e.g., Adner and Helfat, 2003; Kor and Leblebici, 2005; Moliterno and Wiersema, 2007; Rosenbloom, 2000; Tripsas and Gavetti, 2000; Ray, Barney, and Muhanna, 2004). However, central to this perspective is the rarely investigated notion of 'asset orchestration' (Helfat *et al.*, 2007), by which managers endeavor to develop fit between their resource-management focused decisions. Such study is warranted because, as Crook *et al.'s* (2008) current meta-analysis of the resource/performance relationship demonstrates, the contingences within managers' resource-related 'strategic choices' are poorly understood and form a critical future research agenda.

Building on the foundational work of Helfat and Peteraf (2003) and Helfat *et al*. (2007), we

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focus on two important dimensions of asset orchestration: resource investment (Maritan, 2001) and resource deployment (Sirmon *et al.*, 2007). While resource investment decisions determine how the firm invests to acquire and develop resources—defined as the tangible and intangible assets controlled by an organization (Helfat and Peteraf, 2003)—resource deployment decisions determine the specific market segment(s) in which to engage those investments. Both resource investment (Kor and Mahoney, 2005; Maritan, 2001) and deployment decisions (Greve, 2000; Sirmon, Gove, and Hitt, 2008) are important to firm success; however asset orchestration emphasizes the interdependent performance effect of these decisions. That is, the 'fit' between resource investments and their means of deployment is important for firm performance. Sirmon *et al.* underscore this point by arguing that '[e]ffectively integrating investment and deployment decisions is likely critical for performance' (Sirmon *et al.*, 2008: 932). Despite this theoretical expectation, no research has examined the contingent performance effects based on the integration of these decisions.

The current study addresses this gap by empirically examining how resource investment and deployment decisions work in concert to affect firm performance. Moreover, we use prior research on competitive imitation (e.g., Lieberman and Asaba, 2006) and industry recipes/norms (e.g., Fiegenbaum and Thomas, 1995; Kraatz, 1998; Spender, 1989) to extend our theoretical knowledge of this interdependent relationship. Investigating a sample of financial service firms (i.e., banks), we argue and find support for the notion that deviation from the investment norms set by rivals in terms of human and physical capital is risky (Barreto and Baden-Fuller, 2006; Deephouse, 1999). Greater investment deviations lead to performance declines unless they are supported by congruent deployment decisions. When managers' deployment decisions support investment decisions, we argue and find general support for the outcome that greater investment deviation, either positive or negative, leads to increasing performance, although not at equal rates. Conversely, when coupled with incongruent deployment decisions, the negative effects of investment deviation, in either direction, are amplified. This research, therefore, suggests that ensuring the fit between resource investment and deployment decisions is

more important to firm performance than maximizing or economizing either decision alone, especially when investments deviate from the norms of rivals.

This study offers several contributions to theory and practice. First, the study empirically evaluates the resource investment/deployment contingency suggested by Helfat and Peteraf's (2003) and Helfat *et al.*'s (2007) dynamic managerial capabilities framework and the related 'resource management' perspective of Sirmon and Hitt (2003) and Sirmon *et al.* (2007; 2008). Second, by incorporating the effects of imitation and norms set by rivals, this work extends current theory by integrating competitive context with managers' asset orchestration decisions. This extension also informs research on the dilemma that managers face when choosing between conformity to/ deviations from norms set by rivals (e.g., Deephouse, 1999). Third, the empirical support for our theory adds considerable merit to the exploration of other contingencies within the logic of asset orchestration. Fourth, it directs practitioners to engage in asset orchestration to optimize performance.

Next, we briefly review contingency theory as a context for asset orchestration. Thereafter, we develop theoretical arguments leading to the study's hypotheses, explain the research methodology, and present the results. We close with a discussion of the study's findings.

THEORETICAL FRAMEWORK

Contingency theory focuses on the performance effects of 'fit,' defined as the matching of two or more organizational factors of concern (Donaldson, 2001; Van de Ven and Drazin, 1985). Many organizational factors have been examined from a contingency perspective, including structure/environment (e.g., Thompson, 1967), strategy/structure (e.g., Chandler, 1962), strategy/ environment (e.g., Zajac, Kraatz, and Bresser, 2000), and strategy/governance (e.g., Yin and Zajac, 2004), among others. Overall, these streams of research, spanning organization theory and strategic management, suggest that better fit yields higher performance.

Contingency theory's application to research on resources has primarily focused on the resource/ environment relationship. For example, Brush and

Artz (1999) focus on the contingent value of bundles of resources (i.e., capabilities) working together and in the presence of informational asymmetries. Miller and Shamsie (1996) demonstrate that property-based resources are more valuable in stable environments, while knowledge-based resources are more valuable in uncertain environments. And research by Aragon-Correa and Sharma (2003) suggests that a firm's competitive context affects the value of its resources in developing proactive, natural environment strategies. While additional research on the resource/environment contingency may prove valuable, investigation is also merited on contingencies suggested by theory on resource management and dynamic managerial capabilities. Based on the limited work available and their critical importance, investigating contingencies involved in asset orchestration is especially promising.

Building in part on Adner and Helfat's (2003) work, Helfat and colleagues (2007) advanced the notion of asset orchestration. They suggested two primary dimensions of asset orchestration: search/selection, of which resource investment is 'an important component' (Helfat *et al.*, 2007: 53), and configuration/deployment. These authors argue that achieving 'fit' between these dimensions is a primary function of effective management. Concurrently, Sirmon *et al.*, (2007) developed the notion of 'resource management,' in which they stressed that synchronizing (i.e., matching of complementary decisions) investment, bundling, and deployment decisions is central to effective management. Thus, both approaches suggest that fit (or the lack thereof) between managers' resource investment and deployment decisions is expected to have strong performance effects.

Recent empirical work demonstrates that at least one resource-management contingency is important. Specifically, research has shown that the interaction between resource bundling and deployment has significant effects on performance. For example, Kor and Leblebici (2005) found that while bundling senior partners with less experienced associates in law firms positively affects performance, coupling that type of bundling with increased levels of service or geographic diversification harms performance. These results are similar to those obtained in the earlier work of Hitt *et al.* (2001). More recently, Sirmon *et al.* (2008) showed that the effective bundling of employees' human capital for specific contexts

positively affects performance. Moreover, they found that the managers' resource bundling and deployment efforts become more important as rivals' resource portfolios approach parity. Despite the advances in our understanding of this particular contingency, little is known about other important contingencies, specifically the outcomes of the relationship between resource investment and deployment decisions. For example, Mosakowski (1993) alludes, in general terms, to this contingency but does not measure or test it. Thus, by theoretically and empirically addressing the contingency between resource investment and deployment decisions, this research enriches our understanding of the important performance effects of asset orchestration.

Resource investment decisions

While some managerial decisions, especially those strategic in nature, are made under conditions of risk (i.e., where probabilities can be assigned to potential outcomes), most are made in uncertain conditions (i.e., where no probabilities can be estimated) (Milliken, 1987). In addition to uncertainty, complexity in the environment and causal ambiguity make resource investment decisions extremely difficult (Dierickx and Cool, 1989). As such, managers try to identify indicators or signals to help formulate decisions.

Research suggests that rivals provide information that influences managerial decisions (Fiegenbaum, Hart, and Schendel, 1996). Imitation of rivals can be a rational response to decision making in uncertain and complex contexts. For example, Lieberman and Asaba (2006) suggest that imitation can preserve the status quo, thereby reducing the chance of failure for any particular firm, even in industries with intense competition. Additionally, imitation can reduce search costs (Chen and Miller, 2007), increase legitimacy (Deephouse, 1999), and mitigate risk (Lieberman and Asaba, 2006). Over time, these imitative tendencies often lead to conformity (Chen and Miller, 2007; Fiegenbaum and Thomas, 1995) and the establishment of industry norms or recipes (Spender, 1989) with respect to many actions, including 'resource commitments' (Deephouse, 1999), or as we refer to them herein: resource investments.

Therefore, imitating rivals' resource investment levels and the norms iterative rounds of competition have created, offers managers a 'safe' decision

alternative. However, in an attempt to differentiate the firm, managers can deviate from the norms set by rivals. The firm can invest in specific resources at levels higher or lower relative to their rivals. Thus, even if rivals possess the same types of resources, deviation in the level of investment in specific resources is likely to produce significantly different capacities (Castanias and Helfat, 1991, 2001; Dierickx and Cool, 1989; Kor and Mahoney, 2005).

Firms must invest in a myriad of resources; however, for service-based firms, including financial service firms (i.e., banks), which form this study's sample, the lack of manufacturing and related functions elevates the importance of human and physical capital. Service-based firms rely heavily on their physical capital (i.e., buildings, equipment, information technologies, etc.) and human capital (i.e., the skills, education, experience, and knowledge of employees) (Becker, 1964; Harris and Helfat, 1997) to influence competitive outcomes. However, these critical resources require directed actions by the firms; managers must decide at what level to invest in their acquisition and/or development.

As suggested above, conformity with rivals in terms of resource investments offers several benefits. Moreover, we argue that low investment relative to rivals can lead to negative outcomes. While low investment may economize (i.e., conserve) financial resources, this approach may, paradoxically, be more costly over the long term (e.g., losing the potential to achieve a competitive advantage; requiring significant investments to regain competitive parity). For example, choosing to invest in human capital at low levels relative to rivals can lead to serious problems. First, this investment pattern makes the firm less attractive than rivals to highly qualified and experienced personnel. Thus, of the hierarchy of skills within human capital (i.e., generic, industry- and firm-specific (Castanias and Helfat, 1991; Harris and Helfat, 1997), low investment relative to rivals suggests the firms will be less able to attract candidates with coveted industry-specific skills. Moreover, because highly skilled people would likely, all things being equal, prefer to work with skilled colleagues, the human capital deficit experienced by firms that invest in human capital at low levels will be long lasting.

Exacerbating this problem, current employees have an incentive to seek employment from better paying rivals as their industry-specific skills improve. Again, these individuals may prefer to work with highly talented colleagues from whom they can learn more and perform at higher levels. Low investment relative to rivals in human capital, therefore, creates the potential for significant employee turnover in the firm. Additionally, the remaining employees who could not secure more lucrative employment may not be as productive because they are limited by inadequate skills, insufficient learning opportunities, or lower motivation. These concerns are likely to increase as the firm's negative deviation from rivals' level of investment in human capital becomes more pronounced.

Similarly, low investment relative to rivals in physical capital, such as facilities and information technology, can also impede the firm's effectiveness. For example, low investment in facilities might result in less desirable branch locations, insufficient building space, delayed maintenance, and outdated décor, all of which can reduce clients' motivation to engage the firm's services, especially in competitive markets where more attractive options are available. Additionally, low investment relative to rivals in physical capital may result in older equipment and less effective information technology. Older equipment and technology often limit the range of services that a firm can offer to its customers. For example, in banks, older information processing technology limits the efficiency with which they can process complicated transactions. In fact, some banks with limited information technology may not be able to offer sophisticated services that are available from rivals, such as customized letters of credit, loan payment, and maturity schedules. While information technology costs can vary from year to year, attempting to economize with low investments in physical capital may actually increase client dissatisfaction (Priem, 2007), thereby producing a competitive disadvantage for the firm.

In total, these arguments suggest that firm performance is likely to suffer as investment levels in human and physical capital fall further below those of rivals.

Hypothesis 1a: Low investment relative to rivals in physical capital negatively affects firm performance.

Hypothesis 1b: Low investment relative to rivals in human capital negatively affects firm performance.

On the other hand, managers can decide to invest in their physical and human capital at levels higher than rivals. On the surface, it seems that such decisions should contribute to enhanced competitiveness and increased performance. And, there is research suggesting that consistent increases in resource investments relative to the firm's historic levels (i.e., internal comparisons) can have positive effects of performance (Kor and Mahoney, 2005). However, several factors suggest that high investment relative to rivals is likely to produce negative outcomes.

First, high investment in physical and human capital relative to rivals can disrupt the status quo in the industry. Such a disruption is likely to increase rivalrous actions, which, in turn, can negatively affect performance (Lieberman and Asaba, 2006). Second, high investment relative to rivals increases firm risk. For example, investing in unproven technologies can be very costly even if they are as effective as promised. Third, high investments relative to rivals can represent expensive opportunity costs. For example, due to limited slack, investments allocated to one resource are unavailable for investing in another. When high investment levels in one resource appropriate cash flows from alternatives, the shortchanged resource(s) represents an opportunity cost. Moreover, these underfunded resources may lead to areas of competitive deficiency or disadvantage for the firm.

Additionally, high investment relative to rivals in a resource can be inefficient even if adequate slack exists. Specifically, the additional investment requires greater revenue to maintain acceptable returns on the investment. In competitive environments, where limits on revenues exist, achieving these returns can be challenging. In fact, high investment in both physical and human capital may preclude the firm from efficiently leveraging those investments. Research has shown that increasing the number of associates who receive lower compensation relative to the number of more highly compensated partners (i.e., leverage) improves performance in law firms (Hitt *et al.*, 2001; Kor and Leblebici, 2005). Increased leverage allows the partner to generate more revenue by having associates perform routine tasks that, nonetheless, are

necessary to provide the firm's services. However, research by Zardkoohi *et al.* (2006) shows there are limits to beneficial leveraging. Conclusions based on their research suggest that high investment relative to rivals in law firm partners' general, industry-, and firm-specific skills is not likely to generate adequate returns because of limits to beneficial leveraging. Additionally, high investments relative to rivals in law firm associates face similar limits to beneficial leveraging. Similar to the legal-service firms, the leveraging relationship between senior lending officers and associates in banks is subject to the same limitations. Importantly, in competitive environments, these limits become embedded in industry recipes/norms, thus high investments relative to rivals in human capital are expected to be problematic. Likewise, high investments relative to rivals in physical capital are expected to negatively affect performance. While investments in physical capital can generate positive returns in service firms, the extra costs of high relative investments are likely to create a higher cost structure, without producing adequate efficiencies or revenue gains that offset the additional costs.

Together, these arguments suggest that maximizing resource investments can be detrimental to performance. Specifically, these arguments suggest that firm performance is likely to suffer as investment levels in human and physical capital rise above those of rivals.

Hypothesis 2a: High investment relative to rivals in physical capital negatively affects firm performance.

Hypothesis 2b: High investment relative to rivals in human capital negatively affects firm performance.

Contingencies within asset orchestration: resource investment and deployment

Decisions regarding the amount to invest in resources represent one aspect of asset orchestration. To compete effectively, managers must also make decisions regarding how to best deploy those investments (Helfat *et al.*, 2007; Makadok, 2003). Markets' contexts, however, vary in their resource requirements (Miller and Shamsie, 1996), emphasizing the importance of matching these decisions in order for the firm to compete effectively and

perform well. Thus, while resource investments have direct effects on performance, their fit with resource deployment decisions is likely to moderate the resource investment-performance relationship.

Resource deployment decisions involve the selection of the specific market segment(s) in which to engage the firm's resources. These choices, therefore, require managers to understand the various market segments in which the firm can compete and the needs of consumers in those segments. To increase performance, managers must 'conceive of strategies that will increase consumer benefit and, thus, payments from consumers' (Priem, 2007: 223).

The markets of most service-based organizations have experienced substantial changes in recent years due to the introduction of new technologies (e.g., Internet banking, online tax return preparation) and turbulence in the competitive landscape (e.g., new financial services offered by rivals, new competitors entering market segments, and globalization). These changes have sharpened differences in various consumers' desires, especially in the level of sophistication of preferred services. For example, increased globalization has caused large corporations to require increasingly complex and sophisticated law services. To capture these clients, some law firms have begun to offer their services in international markets (Hitt *et al.*, 2006); however, other law firms have chosen not to offer this level of sophisticated service and instead focus on other market segments. Similarly, banking firms operate in markets with a wide range of demands that vary in service sophistication. For example, some clients require sophisticated commercial loans and depository services, while other clients require more simple services such as individual checking and saving accounts with an occasional loan request. In both cases, the primary services are similar, but the level of sophistication differs considerably. Resource deployment decisions indicate in which market segment(s) the firm will utilize its resource investments.

Because simpler service offerings require lower customization and less sophisticated information technology, there are fewer demands on the resources needed to operate in this market segment. The required skills and experience of employees are lower, and employees are more interchangeable because the firms rely largely on generic and basic industry-specific human capital

rather than higher levels of industry- or firm-specific skills. Furthermore, the facilities do not need to be located especially near to clients and can be smaller as clients are processed more efficiently due to higher levels of standardization. Information technology can be streamlined because little client customization is necessary. These characteristics require lower levels of investment in resources to provide expected services as opposed to those necessary to provide more sophisticated services. As such, firms are able to develop human capital and physical capital with these characteristics via low investment relative to rivals. In fact, investing more than the minimum necessary is likely to generate slack human and physical capital. Underutilized slack resources create inefficiencies and negatively affect performance due to higher overall costs without producing compensating revenues. Therefore, low investments in human and physical capital relative to rivals complement deployment in market segments where less sophisticated services are required.

Alternatively, offering more complex and sophisticated services places greater demands on the resources. The general and industry-specific skills and experience required of employees is greater in this case to address idiosyncratic client demands that require customized solutions. Furthermore, as the favored solutions vary per firm, the skills of employees must be refined to be firm-specific and at times even client-specific. Therefore, high investment in human capital relative to rivals is required to hire and/or develop employees with appropriate levels of human capital. Similarly, the firm's physical capital needs to be more proximal to clients as the need for rich communication increases and the complexity of customization is greater. Additionally, information technology must provide enough flexibility to accommodate these customized solutions. Thus, greater investments relative to rivals in human and physical capital complement deployment in market segments requiring complex and sophisticated services.

From a contingency theory view, fit and misfit are central concerns; each has performance implications. While fit has positive implications for firm performance, misfit between two important factors is likely to have a negative influence on firm performance. In terms of asset orchestration decisions, investments in human and physical capital should be matched with the appropriate deployment decisions. For example, in banking firms, as

in many other services-based organizations, high investment relative to rivals in human and physical capital should be most effective when the firm deploys these investments in market segments requiring sophisticated services. Alternatively, low investment relative to rivals in human and physical capital with the same deployment decisions represent misfit. We test both:

Hypothesis 3a: Matching high investment relative to rivals in human capital with deployment in market segments requiring sophisticated services positively affects firm performance.

Hypothesis 3b: Matching high investment relative to rivals in physical capital with deployment in market segments requiring sophisticated services positively affects firm performance.

Hypothesis 4a: Matching low investment relative to rivals in human capital with deployment in market segments requiring sophisticated services negatively affects firm performance.

Hypothesis 4b: Matching low investment relative to rivals in physical capital with deployment in market segments requiring sophisticated services negatively affects firm performance.

METHOD

Sample

Because critical resources and industry recipes/norms vary from industry to industry, and low extraneous heterogeneity is desirable (Rouse and Daellenbach, 1999), a single industry, the regional banking market within the U.S. financial services industry, was selected for the sampling frame. Because of its maturity, industry recipes/norms within the regional banking market are established (Deephouse, 1999). Following Bantel and Jackson (1989), the regional banking market consists of banks that actively offer traditional lending and depository services, with assets ranging from $100 million to $5 billion. Regional banks are relevant for this study because they make ongoing and substantial investments in human and physical capital while their deployment decisions focus on services that vary in their level of sophistication (Ramaswamy, 1997; Stemper, 1990). Moreover,

rival firms acquire resources from similar strategic factor markets (Barney, 1986) and encounter similar environments (Spender, 1989).

The sample was drawn from the Federal Depository Insurance Corporation (FDIC). The FDIC is a desirable source because it comprehensively lists all depository entities in the United States and its data are reliable due to the requirement for regular submission of standardized reports (Bamford, Dean, and McDougall, 2000; Hempel, Simonson, and Coleman, 1994). Our sample of 284 firms represents all regional banks with market-based performance data over the period of 1998–2002. Because of missing data, the total number of firm-year observations in the sample is 1,119. Within the regional banking market, Bantel and Jackson (1989) identified three classes of banks based on asset size including the 1) $100 to $300 million, 2) $300 million to $1 billion, and 3) $1 billion to $5 billion. Using this asset-based stratification, the sample contains 249 observations in the $100 to $300 million group, 560 observations in the $300 million to $1 billion group, and 310 observations in the $1 billion to $5 billion group. Furthermore, each of the FDIC's eight regions across the United States is represented.

Dependent variable

Firm performance

Economic performance is the outcome of interest for this study. We employ a market-based measure of economic performance, Tobin's q, which compares the firm's market value to the replacement costs of its assets. For several reasons, Tobin's q is highly relevant for this study. First, Tobin's q indicates when a firm is 'using scarce resources effectively... or poorly' (Lewellen and Badrinath, 1997: 78), reflecting 'the heart' of this study's theoretical arguments. Second, Montgomery and Wernerfelt indicate that '[b]y combining capital market data with accounting data, q implicitly uses the correct risk-adjusted discount rate, imputes equilibrium returns, and minimizes distortions due to tax laws and accounting conventions' (1988: 627). These characteristics of a performance measure are important because they allow for the accurate comparison of firms that may differ on these factors over time. Third, this measure is a dynamic indicator of the market's reaction to firm actions and expectation of those actions on future performance. As such, it is more sensitive to the effects

of configuring investment and deployment decisions than accounting-based measures.

Following Kor and Mahoney (2005), we used the firm's market value and long-term debt to total book assets to proxy Tobin's q. Values below one indicate that the firm is poorly managing its resources, while values surpassing one indicate the extent of the firm's value creation and economic performance via effective use of resources. Using this formula avoids sample biases produced in more data intensive formulas (DaDalt, Donaldson, and Garner, 2003). Moreover, due to banks' unique reporting standards, the other formulae are less effective.[1] Also, because Tobin's q quickly reflects the market's reaction to firm actions, the data were collected at the end of each year.[2] As such, longer lag times only increase the likelihood of spurious results driven by exogenous events. The required data were obtained from the FDIC and Research Insight.

Independent variables

Physical capital investment

Physical capital refers to assets such as buildings, equipment, and computer systems. Physical capital is critical to a bank's competitive posture and positioning within its competitive landscape. For example, the number and location of branches along with the information systems employed affect the bank's ability to provide services desired by its customers *vis-à-vis* its competitors. Following Kor and Mahoney (2005), we argue that cash flows directed toward a resource represent the firm's investment in that resource. Thus, a bank's investment in physical capital is demonstrated by the cash flows directed toward these resources. These expenditures are listed in the banks' detailed reports to the FDIC. Specifically, banks declare their expenses for premises (i.e., building) and equipment (e.g., information systems, communication equipment, software). We utilize the ratio

of premises and equipment expenses to number of branches to proxy the bank's level of investment in physical capital.

Human capital investment

Human capital refers to the skills, education, experience, and knowledge of the firm's employees (Becker, 1964; Harris and Helfat, 1997). As with physical capital, human capital, is critical to a bank's success. Similar to many service industries, human capital is one of the most important resources held by the firm (Hitt *et al.*, 2001). For example, employees' experience and knowledge affect the types of services that the bank offers and the quality of the services it provides.

Banks' develop human capital by hiring and investing in their employees. Thus, a firm's investment in human capital is reflected by its cash flow directed to employees' salary and benefits. Low investment relative to rivals in their employees indicates less concern about skills, motivation, and retention. On the other hand, high investment relative to rivals in employees indicates more concern about skills, motivation, and retention. We measure this investment with the ratio of salary and benefit expenses to full-time equivalent employees.

The validity of this measure is supported in several ways. First, labor economists suggest that wage differentials between people are due to two factors: person and firm (Abowd, Kramarz, and Margolis, 1999). Empirical results show that the majority of compensation differential is due to individual differences in human capital, while a smaller portion is due to firms' specific choices regarding how to motivate, retain, and identify employees with better person/job fit (Abowd *et al.*, 1999). Thus, the level of investment relative to rivals indicates a choice by managers as well as reflects the level of employees' human capital in which the firm is investing. Second, these findings have been corroborated in strategic management research; for example, Hitt *et al.*, (2001) found starting salaries were positively correlated with the quality of a person's education. To provide further validity for this measure, we gathered data on the titles of specific employees in each bank, assuming that titles differentiate among employees' human capital. Using proprietary data from Accuity's 'The Global Banking Resource' database, we identified employees with the titles of

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[1] One of the banks' primary activities is accepting deposits. However, banks list deposits as current liabilities, which disrupts the more elaborate formulas of Tobin's q. Long-term debt is reported in a traditional manner.

[2] Evidence suggests that markets, indeed, respond quickly to information about firm actions. For example, Malkiel (2005) provides evidence that the vast amount of professional investment managers do not outperform the market, which would be possible if market prices did not adjust quickly to information. Nonetheless, different lag structures were tested with results largely similar to those presented.

'vice president,' 'senior vice president,' or 'executive vice president' in each branch and head office per bank. We weighted and summed these counts to develop a bank-level figure. The weighting allowed for differentiation between the title of vice presidents and senior/executive vice presidents. The correlation between our human capital investment measure and this figure was 0.59 (p <0.01). Together these three sources of supportive empirical work suggest that compensation reflects *investment* in human capital.

The theoretical arguments presented address competitors' relative investment levels as compared to rivals. Because the regional banking industry is mature, we operationalized rivals' investment level with the investment levels per asset-class. More specifically, following the procedures used by Chang and Singh (1999) and Sharma and Kesner (1996), each bank's levels of relative investment in physical capital and human capital were determined by comparing their investment level with the average investment level of their asset-class group (i.e., $100M-$300M, $300M-$1B, or $1B-$5B). Utilizing asset-class groups helps to avoid size biases. Zero represents norms set by rivals for the level of investment in physical or human capital, while negative and positive figures represent the firm's amount and direction of deviation from that norm. FDIC data were used to identify the asset-based peer group.

Deployment decision: service sophistication

Banks can deploy their investments into various market segments, which vary in the requisite level of service sophistication. In fact, the level of sophistication can be represented on a continuum ranging from simple (i.e., retail or consumer banking) to complex (i.e., wholesale or commercial banking) (Ramaswamy, 1997; Stemper, 1990). More simple services focus on individual consumer's retail needs. In this segment, banks offer home, car, and personal loans where approvals can be routinized via automated credit application evaluation systems. Similarly, the depository services are more streamlined and simple. More sophisticated services, conversely, focus on commercial needs. In this market segment, banks largely focus on lending and support depository services for enterprises (i.e., businesses). Sophisticated lending

approval mechanisms, involving experienced commercial lenders, complex financial analysis software, and multiple levels of approval are needed for these services. Additionally, the depository services and support infrastructure are more elaborate and include sophisticated accounts such as commercial sweep accounts, which transfer deposit balances overnight for more attractive returns.

Banks' deployment decisions thus, range on a continuum from simple to sophisticated services. Because the distribution of the bank's loan portfolio reflects its position on this continuum (Ramaswamy, 1997), we operationalized the *service sophistication* of the bank's deployment decision with the ratio of commercial-related loans (i.e., construction, commercial real estate, multifamily housing, farmland, farm operations, and industrial loans) to total loans. This continuous variable ranges from zero to one, with banks offering simple services having a lower score (closer to zero) and those offering sophisticated services having a higher score (closer to one). The data for this variable were collected from the FDIC. Lastly, in order to test the contingency logic presented in Hypotheses 3a, 3b, 4a, and 4b, we used the interaction approach of Van de Ven and Drazin (1985), where the product of the investment level and service sophistication variables is used to examine fit.

Control variables

Empirical evidence suggests additional factors might affect performance, which we explicitly control for with five additional variables. In addition, our analyses, as discussed below, account for issues pertaining to endogeneity.

First, we control for the size of the organization because research suggests that size can affect performance outcomes (Haveman, 1993; Zajac *et al.*, 2000). *Firm size* is represented by the number of deposit accounts. Second, we control for the type of charter, which has been shown to affect performance (Bamford *et al.*, 2000). Charters are either national class, which are more difficult to obtain, thereby sending a strong message to the market, or state class, which are more easily obtained, thus sending a weaker message to the market. We operationalized *charter* with a dummy variable: national charters are coded zero, while state charters are coded one. Third, because prior performance might affect market returns, we control

for *prior performance,* which is operationalized by the bank's return on assets of the preceding year.

The fourth and fifth control variables address regional differences in investment decisions. For example, banks in California or New York may differ from banks in Montana in terms of their investment levels due to regional influence. The first control designed to capture this influence is a dummy variable indicating the state where the firm is headquartered. There are 39 states represented in the sample; thus, the 38 dummy variables are used to control for the effect of geography/locale on physical and human capital investment patterns.[3] The second control for regional differences focuses on human capital investment exclusively. Here we utilized the eight FDIC regions to control geographic differences with a dummy variable. Specifically, we assigned *region* a one for the Boston, New York, and San Francisco regions, which have the highest mean salaries of the eight FDIC regions, and a zero for the other five regions. To determine this categorization, we used ANOVA to test for regional differences. The results showed that there were two regional groupings in which there were no differences within but differences between groupings. Thus, there were no statistically significant differences in the mean salaries among the regions within each grouping, while there was a statistically significant difference in mean salary between the two regional groupings ($t = 9.39$, $p < 0.001$). Together, the *region* and *state* control variables remove the influence of regional effects on investment decisions.

Analytical approach

Because the data are panelized and several variables are endogenous, we use a two-stage least squares (2SLS) cross-sectional times series methodology. Specifically, we employ STATA's XTIVREG random-effects regression procedure. The random-effects application minimizes problems with autocorrelation and heteroskedasticity (Bowen and Wiersema, 1999; Hitt, Gimeno, and Hoskisson, 1998; Sayrs, 1989). Moreover, random-effects models account for both the temporal (within firm) and interorganization variation present in the sample (STATA Press, 2007).

The 2SLS application appropriately accounts for the endogenous character of the service sophistication and human and physical capital investment variables. More specifically, to remove bias resulting from modeling endogenous variables with a single equation (e.g., standard ordinary least squares [OLS] models), a two-stage procedure using instrumental variables was employed (Greene, 2003; Morrow *et al.*, 2007). To be effective (i.e., not weak) the instrumental variables should not be related to the performance variable predicted in the second stage, but should be related to the endogenous variable predicted in the first stage (Kennedy, 2003). We identified three instrumental variables meeting these criteria, *firm age, nontransaction deposits, and additional noninterest revenues.* Firm age specifies the years since founding. Nontransaction accounts represent the amount of deposits in saving accounts. Management is limited in its ability to affect these balances because external market forces (i.e., the Federal Reserve's Federal Fund rate) most strongly determines a savings account's rate of return. Additional noninterest revenues include fees earned on activities in addition to lending and depository services. These three instrumental variables were included in the first-stage models, but were not included in the second-stage performance models. We discuss the empirical support for these instrumental variables in the results section.

Additionally, to accurately test our hypotheses, we utilize spline functions in our models. Spline functions are useful in testing theory that suggests that a continuous relationship will change slopes at critical thresholds (Greene, 2003; Marsh and Cormier, 2002). Spline functions help depict differences in behavior above and below the threshold level (Greve, 2003). In our study, we examine outcomes when investment levels are above and below that of rivals. Instead of splitting the sample and modeling various subsamples individually, which would disrupt continuity, spline functions allow continuous relationships to meet and change slopes at theoretically determined threshold points, called knots (Greene, 2003; Marsh and Cormier, 2002). In our study, the knot is theoretically determined to be at the investment norms established by rivals. More specifically, a spline function splits a single continuous variable into two separate variables, allowing one to model the relationship 'above the knot,' while the other models the relationship 'below the knot.' Specifically,

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[3] While these dummy variables are included in each model, due to length considerations, they are not displayed in the results tables, but those results are available from the authors.

in our study, the physical and human capital investment measures are separated into *low investment relative to rivals* and *high investment relative to rivals.*

RESULTS

The descriptive statistics and correlation matrix are presented in Table 1. Multicolinearity is not a concern; the mean variance inflation factor (VIF) diagnostic of 6.25 is well below accepted limits. To calculate the VIF statistics, we used OLS models, which are more conservative for this diagnostic test (Hitt *et al.*, 2006) because random-effects regression does not allow for their calculation. Even more assuring is the fact that the instrumental variables are not present in any of the second-stage performance models where the hypotheses are tested.

The 2SLS random-effects regression results for the hypotheses are presented in Table 2 and 3. However, prior to examining the primary results, it is important to substantiate the use of the three instrumental variables. Again, to be effective (i.e., not weak) the instrumental variables should 1) not be related to the performance variable predicted in the second stage, while they should be 2) related to the endogenous variable predicted in the first stage. For the first condition, Table 4 presents a common, single equation, random-effects regression model. This model was not part of the two-stage procedure, but instead demonstrates that the three instrumental variables do not have a statistical relationship with Tobin's q. As for the second condition, the first-stage difference coefficients listed in Table 2, Models 1–3, and Table 3, Models 6–8, show that at least one of the instrumental variables per model has a statistically significant relationship with an endogenous variable (STATA Press, 2007). In total, these results suggest that the instrumental variables in the 2SLS random-effects procedure relieve concerns of endogeneity.

Moving to the analyses providing tests of the hypotheses, we examine the second-stage models presented in Table 2, Models 4 and 5, and Table 3, Models 9 and 10. Hypotheses 1a and 1b suggest a negative relationship between low investment relative to rivals in physical and human capital and Tobin's q, respectively. The accurate interpretation of these coefficients requires care. When dealing exclusively with the negative deviations that low

Table 1.   Descriptive statistics and correlations

Variable	Mean	S.d.	1	2	3	4	5	6	7	8	9	10	11	12
1 Tobin's q	3.36	12.67												
2 Firm age	66.14	42.92	0.10											
3 Additional noninterest revenue	4918.25	9185.19	0.04	−0.02										
4 Nontransaction deposits	545509.70	548000.80	0.00	0.05	0.54									
5 Region	0.52	0.50	−0.01	−0.03	−0.08	0.02								
6 Prior performance	0.01	0.00	0.06	0.01	0.12	0.15	0.08							
7 Firm size	53539.33	54276.77	0.03	0.23	0.48	0.81	0.02	0.10						
8 Charter	0.73	0.44	−0.11	−0.21	0.00	−0.02	0.11	0.04	−0.08					
9 High investment relative to rivals in PC	1.06	99.99	0.03	−0.13	0.14	−0.03	−0.04	−0.01	−0.12	−0.16				
10 Low investment relative to rivals in PC	−0.62	60.16	0.10	−0.38	0.03	−0.18	0.02	−0.08	−0.31	−0.02	0.38			
11 High investment relative to rivals in HC	−0.05	7.31	−0.02	−0.24	0.07	−0.11	0.16	−0.04	−0.22	0.10	0.28	0.38		
12 Low investment relative to rivals in HC	−0.18	5.05	0.02	−0.24	0.04	−0.09	0.23	0.05	−0.19	0.07	0.22	0.48	0.45	
13 Deployment decision: service sophistication	0.00	0.21	−0.04	−0.50	0.00	0.11	0.01	0.16	−0.10	0.04	0.10	0.27	0.17	0.21

Correlations greater than 0.056 are significant at $p < 0.05$; correlations greater than 0.074 are significant at $p < 0.01$; n = 1119. The 38 state dummy variables are not listed to conserve space. They are available from the author(s).

Table 2. Results of 2SLS random effect regression of Tobin's q on physical capital investment and deployment decisions

	1st Stage			2nd Stage			
	Model 1 Deployment	Model 2 Above PC	Model 3 Below PC	Model 4 Tobin's q		Model 5 Tobin's q	
Intercept	−0.014	−45.051	10.899	67.413***		65.416***	
Firm age	0.021***	−3.370***	0.810				
Additional noninterest revenue	0.000+	0.001***	0.000*				
Nontransaction deposits	0.000	0.000	0.000***				
Region	0.002	−4.468	5.932	−0.593		−0.986	
Prior performance	0.761	123.130	−380.025	76.616*		67.141*	
Firm size	0.000	0.000	0.000	0.000		0.000	
Charter	−0.054**	22.600*	4.213	−4.298***		−2.700***	
High investment relative to rivals in PC				−0.031*	H2a	−0.039**	
Low investment relative to rivals in PC				0.046*	H1a	0.045*	
High investment relative to rivals in HC	0.000	1.438***	0.292	−0.062+		−0.057+	
Low investment relative to rivals in HC	0.001+	0.193	2.926***	−0.075		−0.060	
Deployment decision: service sophistication				−1.884		−5.503+	
Service sophistication * high investment in PC						0.105***	H3b
Service sophistication * low investment in PC						−0.042*	H4b
X2	411.00***	142.00***	263.00***	209.93***		376.150***	

$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; directional hypotheses use single-tailed tests; n = 1119. The 38 state dummy variables were modeled, but are not listed to conserve space. They are available from the author(s).

Table 3. Results of 2SLS random effect regression of Tobin's q on human capital investment and deployment decisions

	1st Stage			2nd Stage			
	Model 6 Deployment	Model 7 Above HC	Model 8 Below HC	Model 9 Tobin's q		Model 10 Tobin's q	
Intercept	−0.023	0.913	−3.117	65.187***		−1.031	
Firm age	0.020***	0.220*	−0.069				
Additional noninterest revenue	0.000*	0.000***	0.000				
Nontransaction deposits	0.000	0.000*	0.000***				
Region	0.001	0.323	1.028	−0.850		−0.029	
Prior performance	0.820	−56.765	−8.204	57.452+		30.415	
Firm size	0.000	0.000	0.000	0.000		0.000	
Charter	−0.052**	3.177**	0.704	−4.102***		−3.688***	
High investment relative to rivals in PC	0.000	0.018***	0.001	−0.015***		−0.013***	
Low investment relative to rivals in PC	0.000**	0.013**	0.032***	−0.004		0.001	
High investment relative to rivals in HC				−0.185*	H2b	−0.090	
Low investment relative to rivals in HC				0.538**	H1b	0.035	
Deployment decision: service sophistication				4.852		0.894	
Service sophistication * high investment in HC						0.764***	H3a
Service sophistication * low investment in HC						0.412**	H4a
X2	370.00***	145.00***	209.00***	182.930***		288.090***	

$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; directional hypotheses use single-tailed tests; n = 1119. The 38 state dummy variables were modeled, but are not listed to conserve space. They are available from the author(s).

investment relative to rivals represents, a positive coefficient indicates that greater deviation leads to poorer performance. Thus, statistically significant positive coefficients are required to support these hypotheses. As shown in Table 2, Model 4, the coefficient for low investment relative to rivals in physical capital is positive and statistically significant. Thus, Hypothesis 1a receives support. Likewise, as shown in Table 3, Model 9, the coefficient for low investment relative to rivals in human capital is positive and statistically significant, providing support for Hypothesis 1b.

Hypotheses 2a and 2b suggest that a negative relationship exists between high investment relative to rivals in physical and human capital and Tobin's q, respectively. Because the high investment variables are exclusively positive numbers, the sign of the coefficient directly expresses the relationship. Thus, statistically significant negative coefficients are required to support these hypotheses. As seen in Table 2, Model 4, the coefficient for high investment relative to rivals in physical capital is negative and statistically significant, thereby supporting Hypothesis 2a. Also, as shown in Table 3, Model 9 the coefficient for high investment relative to rivals in human capital is negative

Table 4. Results of random effect regression predicting Tobin's q

	Model 11 Tobin's q
Intercept	69.370***
Firm age	−0.008
Additional noninterest revenue	0.000
Nontransaction deposits	0.000
Region	−0.349
Prior performance	62.611*
Firm size	0.000
Charter	−4.225***
High investment relative to rivals in PC	−0.015***
Low investment relative to rivals in PC	0.013
High investment relative to rivals in HC	−0.065**
Low investment relative to rivals in HC	0.012
Deployment decision: service sophistication	1.202
$X 2$	261.31***

$+p < 0.10$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$; n = 1119. The 38 state dummy variables were modeled, but are not listed to conserve space. They are available from the author(s).

and statistically significant, supporting Hypothesis 2b.[4]

Additionally, in order to support the spline specifications, we examined the slopes of low and high investments relative to rivals in physical and human capital by testing for differences in their coefficients. The results of these tests indicate that, indeed, the slopes of low and high investment relative to rivals in physical capital are statistically different from each other ($\chi^2 = 4.97$, $p < 0.05$) as are the slopes of low and high investment relative to rivals in human capital ($\chi^2 = 6.67$, $p < 0.01$). These results provide support for the spline specifications. Graphs depicting the results of the tests of Hypotheses 1a–2b are provided in Figures 1 and 2.

Hypotheses 3a and 3b focus on the effect of fit. These hypotheses propose a positive effect on performance when there is a match between high investment relative to rivals in human and physical capital with a deployment decision focused on markets requiring sophisticated service, respectively. To provide support for these hypotheses, the coefficients for the interaction must be statistically significant and positive. As seen in Table 2, Model 5 and Table 3, Model 10, both coefficients are statistically significant and positive, thereby supporting both hypotheses.

Hypotheses 4a and 4b focus on the effect of misfit. These hypotheses propose a negative performance effect resulting from a match between low investment relative to rivals in human and physical capital with a deployment decision focusing on market segments requiring sophisticated services, respectively. Positive and statistically significant coefficients demonstrate empirical support. As shown in Table 3, Model 10, the coefficient for the interaction of low investment relative to rivals in human capital and sophisticated service strategy is positive and statistically significant, thereby supporting Hypothesis 4a. However, as shown in Table 2, Model 5, the coefficient for the interaction of low investment relative to rivals in physical
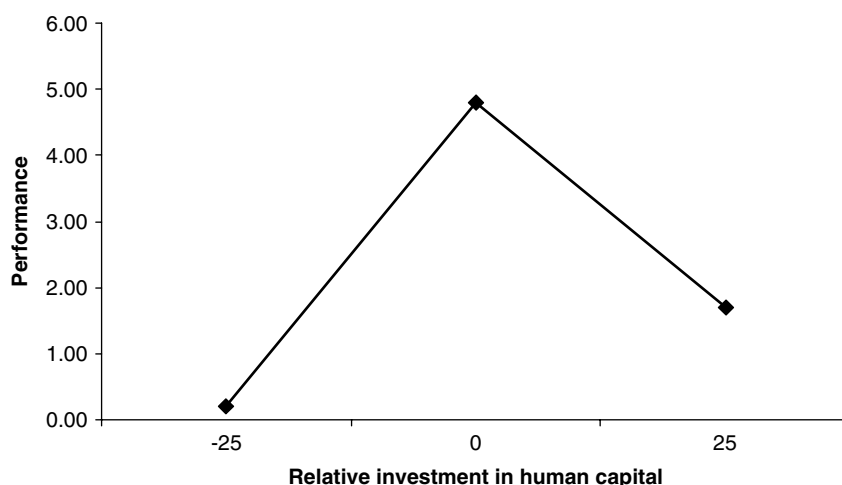
Figure 1.   Effects of low and high investment relative to rivals in human capital on performance
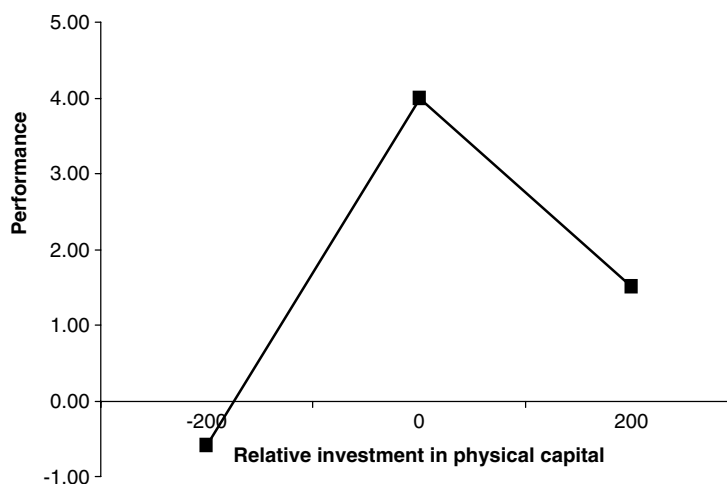

Figure 2.   Effects of low and high investment relative to rivals in physical capital on performance

capital and sophisticated service strategy is statistically significant but negative. This outcome does not support Hypothesis 4b; instead, it suggests the opposite relationship.

Graphs, following the Aiken and West (1991) approach for depicting interactions, are presented as Figures 3 and 4. Overall, Figure 3 demonstrates the theoretically expected contingency effect for the configurations of investments in human capital and deployment decisions. When matched with the appropriate deployment strategy, both low and high investments in human capital relative to rivals produce positive effects on performance. Additionally, both instances of misfit negatively affect performance.

With respect to investment in physical capital, as shown in Figure 4, contingency effects are evident as well, with three of four cases following those predicted by theory. First, coupling high investment relative to rivals in physical capital with a deployment decision of sophisticated services positively affects performance, while coupling that investment with simple services negatively affects performance. Next, following the theoretical arguments, the misfit of coupling sophisticated services with low investment relative to rivals in physical capital negatively affects performance. However, contrary to expectation, coupling low investment relative to rivals in physical capital with simple services negatively affects performance. Instead,
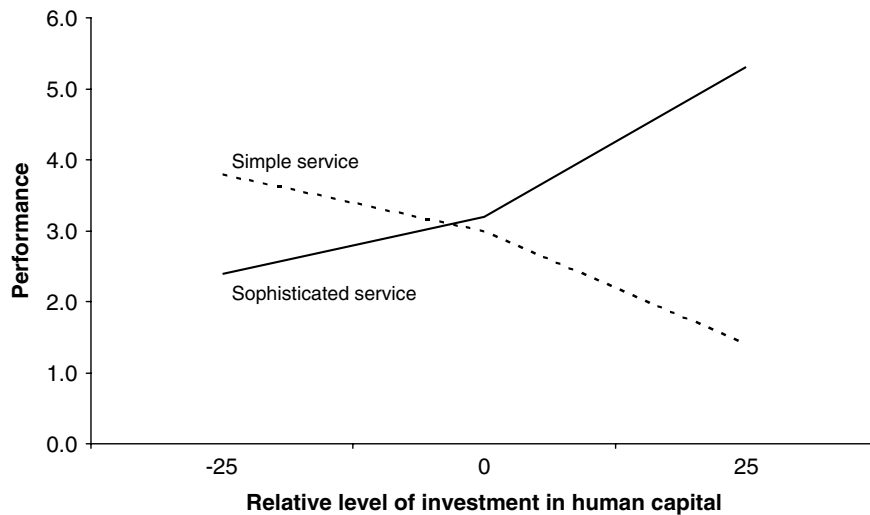
Figure 3.   Interactive effects of low and high investment relative to rivals in human capital and deployment decisions on performance
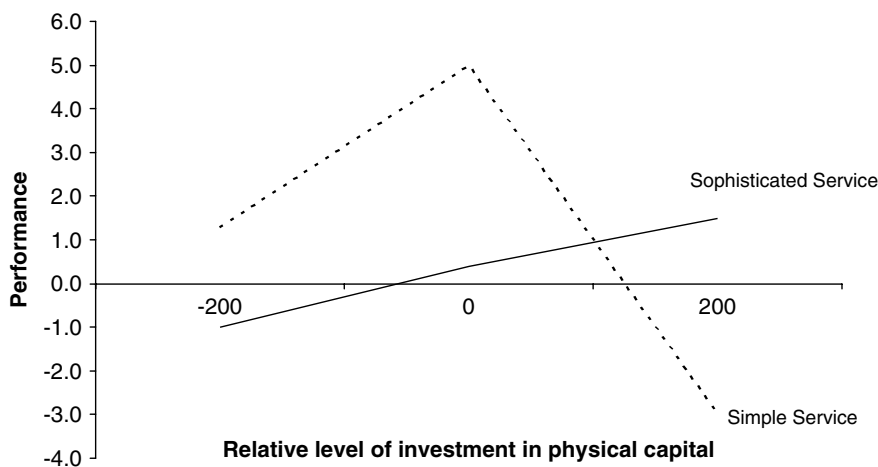

Figure 4.   Interactive effects of low and high investment relative to rivals in physical capital and deployment decisions on performance

for firms pursing simple services, performance is optimized with average investment levels in physical capital.

DISCUSSION

Years ago, Penrose argued that 'the experience of management will affect the productive services that all [the organization's] other resources are capable of rendering' (1959: 5). However, until recently the role of managers and their decisions have largely been absent from resource-based

related research. The logic of dynamic managerial capabilities (Adner and Helfat, 2003), asset orchestration (Helfat *et al.*, 2007) and related work on resource management theory (Morrow *et al.*, 2007; Sirmon and Hitt, 2003; Sirmon *et al.*, 2007, 2008) have helped to reverse this trend. This research furthers this effort. It responds to Barney and Arikan's call that 'more work is needed before the full range of strategy implementation issues not included in the [1991] paper are integrated with a resource-based theory of competitive advantage' (2001: 175). Specifically, we advance knowledge of management's role in utilizing resources by

focusing on key contingencies involved in asset orchestration: resource investment and deployment decisions.

First, based on a sample of banking firms, we found that deviation from the investment norms set by rivals, both higher and lower, for human and physical capital negatively affect performance. These results suggest that conformity in investment decisions to the norms of rivals produces the best performance. This outcome differs somewhat from Deephouse (1999), who found that being a little different from rivals produces better results than being either too similar or dissimilar. His sample, however, was drawn from only one large metro area (Minneapolis-St. Paul, Minnesota), while our sample includes all regions in the United States. Thus, while in a specific market a small difference may be beneficial, when considering investment norms developed by iterative competitive actions across a whole population of firms, our results suggest that being similar to rivals is best.

However, our findings also show that investment decisions alone do not produce the 'best results.' Indeed, optimal results are produced, as our theory suggests, by matching resource investment decisions with congruent deployment decisions. In fact, the highest performance outcomes were achieved when resource investment and deployment decisions 'fit,' regardless of the investment level (i.e., high or low). These outcomes suggest that meeting the investment norms of rivals produce only 'average' results and are a 'safe' bet for managers (low risk). While firm performance is influenced by resource investment decisions, deployment decisions influence the return on those investments. Therefore, we conclude that ensuring fit between resource investment and deployment decisions is more important to firm performance than trying to maximize or economize either decision alone, especially as investments deviate from the norms set by rivals.

Specifically, sophisticated services are often tailored to customer needs and such customization frequently requires substantial information transfers between the client and the service provider. Processing this information and using it to customize the service requires more knowledgeable employees and supporting technology. Therefore, a deployment decision focusing on market segments desiring sophisticated services requires high investments relative to rivals in human and physical capital to achieve superior levels of performance. Economizing on these investments is likely to undermine the firm's ability to serve this market.

Alternatively, offering more simple services requires less investment in human capital and physical capital. These simple services are usually more standardized and targeted to the mass consumer market segment. As such, matching this deployment decision with low investments relative to rivals in human capital produced positive performance as expected. Here maximizing investments in human capital while targeting simple services likely produces inefficiency. However, the expected positive outcome for the combination of simple service and low investment in physical capital was not supported. Instead this combination negatively affected performance. This contradictory finding is addressed in detail later.

As a corollary to fit, the results suggest misfit between resource investment and deployment decisions negatively affects performance. For example, when firms invest in human capital at low levels relative to rivals and their deployment decisions focus on market segments requiring sophisticated services, performance suffers. These firms do not have the quality of human capital necessary to provide customized services. Therefore, competitors are able to offer superior services positioning these firms at a competitive disadvantage. Likewise, firms investing in human capital at high levels relative to rivals and focusing their deployment decisions on market segments requiring simple services must absorb unnecessarily high costs for which clients do not pay (Priem, 2007). These human capital investments are likely underutilized creating an inefficient use of resources. Similarly, both cases of misfit between physical capital investment and deployment decisions negatively affected performance.

Figures 3 and 4 graphically display the results of fit and misfit between resource investment and deployment decisions. As shown by the graphs, all four cases of misfit negatively affect performance, while three of four cases of fit positively affect performance. The contradictory outcome for low investment relative to rivals in physical capital and a deployment decision focusing on simple services is intriguing. This purported 'fit' unexpectedly produced negative returns. In fact, for deployment decisions focusing on simple services, investing at levels consistent with rivals produces

the best performance. Thus, in terms of physical capital investment, it seems that low investment relative to rivals impairs a firm's ability to meet its customers' expectations in both simple and sophisticated service markets. However, the magnitude of loss is certainly greater for those firms pursuing simple services. Perhaps, a base level of physical capital is needed to achieve competitive parity, but advantage is seldom achieved with it. Future research is needed to explore this outcome more fully.

In total, these results have important implications for both theory and managerial practice. First, by empirically evaluating the resource investment/deployment contingency implied by Helfat and colleagues' dynamic managerial capabilities framework (2003, 2007) and suggested by Sirmon and colleagues' related 'resource management' perspective (2007, 2008), this research demonstrates that managers play a critical role in the logic of resource-based theory. Thus, while prevailing theory generally suggests that increased levels of investment in human capital is positive due to the value it yields, this research suggests a caveat to that conclusion. Investing to acquire/develop elite levels of human capital may benefit the firm, unless that effort is coupled with deployment decisions that effectively use that investment. In point of fact, offering simple services to a mass market does not fully leverage the value provided by high levels of investment in human capital, thereby creating investment inefficiencies. Coupling these results with research by Sirmon and colleagues (2007, 2008), Hitt and colleagues (2001, 2006) and by Kor and colleagues (2005), who examined different contingencies, demonstrates that the contingencies with which managers must contend are critical in achieving a resource-based advantage. Specifically, how managers orchestrate firm assets, that is, how they select (e.g., acquire/develop via investment) and deploy (e.g., bundle/leverage) resources, significantly affects firm success.

In addition, the present study highlights important contingencies for future research to consider. For example, this research examined how managers invest in both human and physical capital. However, managers could view various resources as substitutes in some circumstances. Thus, it may be possible that human capital is used as a substitute for physical capital or vice versa. For example, information technology may replace human capital

in some tasks. Another managerial contingency is the balance achieved among substitute resources. Achieving such a balance points to the importance of the selection portion of asset orchestration, where managers choose between various resources to acquire, develop, and divest. Divesting, while often overlooked, may be necessary to allow the acquisition of new resources, to engage new strategies, or to simply reduce ineffective investment expenditures (Moliterno and Wiersema, 2007; Sirmon *et al.*, 2007). The empirical support for our theory adds considerable merit to exploring additional contingences involved in resource management and asset orchestration logic. For example, understanding how managers utilize various combinations of resource strengths and weaknesses to compete could be highly instructive. Moreover, it would be valuable for these additional studies to be conducted in other industries and other geographical locations. For example, future research should examine how resources are managed in different formal and informal institutional environments (i.e., different countries).

Second, this research adds richness to our understanding of the value of conforming to or differentiating from norms set by rivals. Specifically, deviation from the investment norms of rivals produces more variance in performance. Firms can either perform very well or very poorly when they deviate from what rivals do. The realized outcome, as our research shows, depends on the match between investment and deployment decisions. However, simply mirroring the investment norms of rivals minimizes the potential of high performance. Rather, firms that do so are likely to attain average performance at best.

Third, our research suggests that practitioners should engage in asset orchestration to optimize performance. However, our results also suggest that managers should not expect that substantial (e.g., high investment relative to rivals) resource investments alone will produce high performance. Having more capable employees and physical capital can be useful, but they must be deployed effectively in order to create value for customers and achieve higher performance (Priem, 2007). In fact, significant investments in resources that are not deployed effectively can actually reduce rather than enhance performance. Likewise, overly conservative managers may produce false economies by reducing their level of investment in human

capital and physical capital; if this level of investment is not coupled with a deployment decision targeting a market segment with more simple requirements, the investments will be insufficient. In total, managers must consider the contingent relationship between the level of resource investment and market segment requirements for their deployment to be effective.

In conclusion, this research offers important insights into the contingent effects of asset orchestration decisions within the umbrella of dynamic managerial capability and resource-management logics. Coupled with other recent empirical work on other contingencies, the results provide an important base for further research that could help us more fully understand how managers shape a resource-based advantage.

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