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DELIBERATE LEARNING IN CORPORATE ACQUISITIONS: POST-ACQUISITION STRATEGIES AND INTEGRATION CAPABILITY IN U.S. BANK MERGERS

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This paper introduces a knowledge-based view of corporate acquisitions and tests the post-acquisition consequences on performance of integration decisions and capability-building mechanisms. In our model, the acquiring firm decides both how much to integrate the acquired firm and the extent to which it replaces this firm's top management team. It can also learn to manage the post-acquisition integration process by tacitly accumulating acquisition experience and explicitly codifying it in manuals, systems, and other acquisition-specific tools. Using a sample of 228 acquisitions in the U.S. banking industry, we find that knowledge codification strongly and positively influences acquisition performance, while experience accumulation does not. Furthermore, increasing levels of post-acquisition integration strengthen the positive effect of codification. Finally, the level of integration between the two merged firms significantly enhances performance, while replacing top managers in the acquired firm negatively impacts performance, all else being equal. Implications are drawn for both organizational learning theory and a knowledge-based approach to corporate strategy research. Copyright © 2004 John Wiley & Sons, Ltd.

INTRODUCTION

The performance of corporate acquisitions has long been a topic of interest to researchers in several disciplines, such as industrial economics, management, and finance. Considerable heterogeneity still exists, however, with respect to the definition of performance (e.g., benefit to the acquiring firm, the acquired firm, the combined entity) as well as to its measurement (accounting returns, stock price reactions, etc.). Overall, evidence shows that stockholders of the acquired firms make positive economic returns, while acquirers' abnormal returns (in either financial or accounting terms) are not statistically distinguishable from zero. Whereas the evidence on the average magnitude of value created for the various counterparts involved is relatively uncontroversial, the explanation of the variance around the mean is still very much in need of both theoretical and empirical work.

In this paper, we focus on acquirers' variation in performance and examine how learning processes specific to the management of the post-acquisition phase affect it. We also provide a theoretical argument and an empirical test for the performance implications of post-acquisition integration decisions, as well as the interaction between these decisions and some resource- and capability-based antecedents. Our focus on the acquiring firm, instead of the target or the combined entity, is influenced by the observation that learning processes and

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post-acquisition decisions are housed primarily within the acquirer's corporate development department or its relevant business unit.

The U.S. banking industry, where the study is positioned, is a good example of a particularly turbulent environment, where the tight coupling of deregulation, disintermediation, and technological evolution has generated an unprecedented wave of acquisitions in a relatively short amount of time. It thus provides a good laboratory for testing whether different acquirers' approaches to post-acquisition management and different levels of expertise in managing the integration process are systematically associated with different performance outcomes.

The section below summarizes relevant prior research. Subsequently, we introduce a knowledge-based perspective, which we apply to the management of acquisition processes, and advance testable hypotheses. The following section then describes the research design, some of the key findings in our fieldwork, and the operationalization of the most important theoretical constructs. Finally, we discuss the results of our analyses and conclude by noting several implications of our findings for theories of corporate strategy and organizational learning.

THE PERFORMANCE OF CORPORATE ACQUISITIONS

Here, we examine how scholars in financial economics, strategic management, and organizational theory have discussed and tested the performance implications of corporate acquisitions.

The market for corporate control and the resource-based views of acquisitions

Research in financial economics has examined returns to acquirers and targets in large samples of acquisitions. In general, it views acquisitions as transactions that reflect the market for corporate control, in which management teams vie for the control of firms' productive assets. If one management team underperforms, then a more competent team takes its place (Manne, 1965; Jensen and Ruback, 1983). Empirically, this research has found that although there are positive gains from the combination of the acquiring firm and the target's assets, most of these gains accrue to shareholders of the target firm. More recently, it has shown that *average* abnormal returns to the acquiring firm are either statistically equivalent to zero (Jarrell, Brickley, and Netter, 1988; Franks, Harris, and Titman, 1991; Loderer and Martin, 1992; Shleifer and Vishny, 1994; Agrawal and Jaffe, 2000) or lower (Agrawal, Jaffe, and Mandelker, 1992). This result is confirmed in the literature on acquisitions in the banking industry developed by financial economics scholars (Hawawini and Swary, 1990; Rhoades, 1994). Rhoades' review of 39 bank merger studies, in particular, showed that changes in acquiring firms' accounting and financial returns around the acquisition event are not statistically significant.

The strategic management field, on the other hand, has focused on several factors that might influence the post-acquisition performance of acquirers. Most prominently, it has used the resource-based view of the firm (Wernerfelt, 1984; Rumelt, 1984; Barney, 1986; Dierickx and Cool, 1989) to test the impact of resource relatedness on such performance (Chatterjee, 1986; Singh and Montgomery, 1987; Lubatkin, 1987; Shelton, 1988; Seth, 1990; Healy, Palepu, and Ruback, 1992; Chatterjee *et al*., 1992). The evidence, however, suggests that no clear relationship links resource relatedness and performance. This variation in results may be explained in several ways. First, there might be several mechanisms that can influence the post-acquisition performance of the combined entity, but that do not rely on the exploitation of economies of scale and scope, and that therefore would not benefit from higher degrees of relatedness between the two firms. Seth (1990), for example, found evidence for coinsurance effects, which allow the combined entity to obtain higher leverage by combining uncorrelated streams of cash flows to yield higher tax shields. Additionally, Baker and Montgomery (1994) observed that LBO firms and 'enlightened conglomerates' can consistently create significant rents by developing idiosyncratic capabilities in the structuring of highly powered incentive systems (LBO firms) and in restructuring, turnaround, and control processes.[1] Second, Barney (1988) argues, consistent with evidence shown by Lubatkin (1987) and Singh and Montgomery (1987), that an acquirer has to create

[1] For another example of how acquirers can consistently create value without recourse to synergistic potential from resource relatedness, see the case of Hanson Plc (Taubman and Haspeslagh, 1992).

a uniquely valuable and inimitable combination of its assets with those of the acquired firm to earn positive abnormal returns on its investment. Although many acquirers may possess resources related to those of a target, the uniqueness condition provides a much more stringent criterion for value creation. Third, although relatedness may sometimes directly and significantly impact performance, as in the context of consolidating and declining industries (Anand and Singh, 1997), these conditions might not be generalizable to other industry conditions. Thus, relatedness may be a necessary but not sufficient requirement for superior performance. Generally, it might be possible to achieve synergy only when firms carefully design and execute integration processes focused on extracting the gains associated with the combination of the two organizations. Accordingly, when resource relatedness is used to explain how economic rents may accrue to acquirers, it is important to include as explanatory variables the activities necessary to extract such rents.

This paper intends to improve our understanding of the predictors of acquisition performance by exploring the explanatory roles of pre-acquisition resource characteristics, learning from prior acquisitions, and key elements of the post-acquisition integration process. By design, however, it restricts the scope of the strategic intent that could potentially be pursued through acquisitive growth by focusing on horizontal acquisitions among commercial banks, where the economic logic can be defined in terms of either cost efficiencies derived from larger scale in the same geographic markets, or by a combination of (more limited) cost efficiencies and revenue enhancement potential from the expansion of activities in new geographic markets. Hence, product diversification strategies (e.g., the acquisition of an investment bank or insurance business) and new product development objectives (e.g., acquisitions of financial 'boutiques' specialized in the structuring or trading of innovative products) are excluded from the scope of the study.

Also, in this study, acquisition performance is defined as the variation in the acquiring firm's overall performance and measured as the deviation from competitors' long-term variation in return on assets.[2] The choice of the accounting measure to proxy the performance construct is forced by the relative unobservability of post-acquisition decisions, as well as learning processes, from the financial market standpoint. Because financial markets are unlikely to be able to anticipate and incorporate information relative to our key explanatory variables in the acquirer's stock price at or around the time of the acquisition announcement, event-study models that focus on cumulative abnormal returns to stock prices are not appropriate for our analysis. The next section reviews the extant literature that focuses on how firms manage the post-acquisition phase.

Research on the management of integration processes

The process acquiring firms use to manage their acquisitions is substantially more complex to study empirically, compared to the relatedness studies reviewed above, because of the lack of process-level data typically available for a sufficiently large number of observations. As a result, prior research in this area has established few definitive findings.

Jemison and Sitkin (1986) indicate that it is useful to think about acquisitions in terms of both their strategic and organizational fit, which generally do not correspond neatly to each other. Thus, the organizational complexity of an acquisition can be quite different from the strategic considerations driving the transaction. Building on this insight, Haspeslagh and Jemison (1991) highlight the relevance of the processes firms use to select their acquisition targets, negotiate the agreement to purchase or to merge, decide how to manage the post-acquisition transition phase, and interact with the acquired firm to implement the selected integration strategy. They also indicate some critical dimensions of the post-acquisition decision-making process, such as the extent of functional integration and the timing for its implementation. Their work was an important step in understanding the dimensions of the integration process and in relating the strategic objectives driving the acquisition to key managerial decisions made in the post-acquisition phase of the transaction.

Subsequent work has attempted to understand post-acquisition processes by focusing on one decision at a time. Consequently, it trades off rich contextual descriptions of the interdependencies among integration decisions for analytical precision and theoretical rigor. For example, Pablo

[2] Please see the Measures paragraph in the section on Research Methodology and Measures for details on the measurement of the dependent variable in this study.

(1994) examined the antecedents of the decision about the level of integration, whereas Datta and Grant (1990) and Shanley (1994) attempted to test the performance implications of this decision and found some support for a positive influence on performance. All these authors define the construct 'level of integration,' drawing on Thompson's (1967) pioneering work, as the extent to which the functions of the acquired unit are linked to, aligned with, or centralized in, the equivalent functions of the acquiring organization, and we make no exception in this study.[3] More recently, Capron (1999) focused her attention on a related phenomenon—the extent of resource redeployment and knowledge transfer between the two organizations—and found that it is significantly related to increased performance. This provides additional evidence that achieving some degree of integration between the two organizations offers economic benefits.

Another important dimension of the post-acquisition integration process involves the degree to which pre-existing resources within the acquired firm are replaced with the equivalent resources of the acquirer, or are simply dismissed. Chief among these resources is the human and social capital embedded in the acquired firm's employees, particularly in its top management team. Contrary to the predictions of the 'market for corporate control' perspective, Cannella and Hambrick (1993) found that managerial turnover was harmful to acquisition performance and that the impact increased in magnitude when more senior managers were replaced. More recently, Krishnan, Miller, and Judge (1997) reached similar conclusions, and noted that the degree of complementarity between the two top management teams positively influences performance and should be protected when possible.

Other studies have researched the antecedents of the decision to replace the target's top management team. Walsh (1988) examined top management turnover rates by comparing post-acquisition turnover in a sample of firms to that of a control group. He found that turnover rates could not be explained by the product market relationship between the acquirer and the target firm. In subsequent work, Walsh and Ellwood (1991) found that post-acquisition turnover is influenced by the pre-acquisition profitability of the *acquirer*, rather than that of the target, as one would expect. In particular, the higher was the acquirer's pre-acquisition performance, the lower was the post-acquisition turnover of the acquired company's management.

In sum, this research has emphasized the potential benefits and the complexities involved in creating value through acquisition processes. Striking the right balance between achieving the necessary level of organizational integration and minimizing the disruptions to the acquired firm's resources and competencies is a fundamental challenge that affects the success not only of the integration process but also of the entire acquisition. Because of these managerial trade-offs, it is important to better understand whether and how firms develop processes and capabilities specific to the management of corporate acquisitions.

The empirical work that explicitly considers the relationship between the acquiring firm's experience and acquisition performance shows that simple 'learning curve' explanations are of limited relevance. Although some studies have found that such experience positively impacts performance (Fowler and Schmidt, 1989; Bruton, Oviatt, and White, 1994), others have found no such relationship (Lubatkin, 1987; Baum and Ginsberg, 1997). Haleblian and Finkelstein (1999) reported evidence for a non-linear, U-shaped, relationship, which highlights possible negative learning effects (Gick and Holyoak, 1987) for the first few acquisition experiences, during which acquirers might inappropriately apply lessons learned in past experiences to contexts that seem superficially similar but are inherently different, thereby reducing the probability of success. In a similar vein, Hayward (2002) finds no linear impacts of prior acquisition experience on short-term stock price reactions, but a number of non-linearities in the quality of such experience (such as the average success of prior acquisitions). Finally, evidence of non-linear experience effects in multi-task contexts (i.e., spillovers of alliance experience on acquisition performance) was found by Zollo and Reuer (2003).

In the next section, we present a knowledge-based perspective on the management of acquisition processes and show that the lack of consistency in empirical tests of the learning curve hypothesis might be due to incomplete theoretical

[3] In the context observed, acquisitions in the banking industry, the concept of 'level of integration' translates into a set of fairly discrete choices related to decisions such as the conversion of information systems, the alignment of loan approval processes, or the rationalization of the two networks of bank branches.

treatment of the underlying organizational learning processes, rather than to anomalies of the M&A context or broader unobserved heterogeneity.

A KNOWLEDGE-BASED PERSPECTIVE ON MANAGING ACQUISITIONS

The knowledge-based view of the firm (Nelson and Winter, 1982; Kogut and Zander, 1992; Grant, 1996) suggests that the outcome of the acquisition process is influenced by the degree to which the acquiring firm develops a capability specific to managing the acquisition process. Prior literature has highlighted this capability as a key prerequisite for completing these complex organizational endeavors successfully (Haspeslagh and Jemison, 1991: Ch. 2). Building on their initial insight, we intend to first develop a theoretical understanding of the mechanisms that might underlie this collective learning process. We then apply these notions to the development of one specific type of acquisition-related capability, i.e., managing the process through which the acquired firm is, partially or totally, integrated within the structures and processes of the acquiring firm. We note that the integration capability is not the only one of relevance to the success of the post-acquisition phase. The ability to identify the appropriate acquisition candidate, for example, is just as important as the ability to integrate it once acquired. Whereas acquirers can develop competence related to different aspects of the acquisition process, in this paper we focus on the integration capability since this is likely to be a crucial antecedent to the performance of the acquisition, and has so far not received specific attention from a theoretical standpoint. We therefore consider other competencies unrelated to the integration process outside the scope of the paper and indicate them as promising areas for future research.

Organizational knowledge and capability-building mechanisms

Previous literature on acquisitions has used research on learning curves originally developed to understand manufacturing processes (Yelle, 1979; Dutton and Thomas, 1984; Epple, Argote, and Devadas, 1991; Lapre, Mukherjee, and Van Wassenhove, 2000) to test whether learning processes exist within acquirers. It linked the accumulation of experience in prior acquisition processes with improvements in acquisition performance as measured by either financial variables or survival (Lubatkin, 1987; Fowler and Schmidt, 1989; Bruton *et al*., 1994; Pennings, Barkema, and Douma, 1994; Baum and Ginsberg, 1997; Haleblian and Finkelstein, 1999; Hayward, 2002). Firms might be able to learn how to manage acquisition processes by simply doing more of the same, and thereby tacitly forming and refining organizational routines that might directly (i.e., without explicit knowledge articulation or codification) impact the performance of subsequent acquisitions. This 'learning-by-doing' hypothesis can be more formally stated and submitted as follows:

> *Hypothesis 1: The greater the acquiring firm's previous acquisition experience, the better the economic performance of the focal acquisition.*

The accumulation of prior experience, however, is not the only way in which firms can develop collective capabilities in handling organizational tasks (Zollo, 1998; Kale, Dyer and Singh, 2002; Zollo and Winter, 2002). We argue that one reason why the prior literature on learning effects in acquisitions has not derived consistent results is that it has failed to account for mechanisms different from 'learning-by-doing' to explain how firms improve in their understanding of the ways acquisitions should be managed. We therefore intend to leverage on, and possibly extend, the work produced by scholars interested in the strategic implications of organizational knowledge to discuss the role of more refined mechanisms in explaining organizational learning processes in contexts such as corporate acquisitions.

Rogers (1980), Winter (1987), and Kogut and Zander (1992) propose several dimensions of organizational knowledge that influence how practices evolve and transfer within and across firms. These dimensions include the degree to which knowledge is articulable, teachable, and codifiable, or the extent to which the individuals and the groups which possess the knowledge are actually aware of it, can describe it, and therefore communicate it using oral or written media (Polanyi, 1962, 1966). These dimensions are clearly interrelated. For example, the degree of articulability and teachability will influence the degree of codifiability. In the context of acquisition management, it is

likely that the knowledge underlying any given organizational process can accumulate in both explicit forms, such as manuals, blueprints, information systems, and implicit forms, such as human memory.

Given the same level of codifiability of knowledge necessary to perform a certain task, however, firms might choose to codify the amount of accumulated experience to different degrees. For instance, firms with equivalent levels of experience might develop different kinds of written tools or information systems related to the management of the acquisition processes. Not all codifiable and teachable knowledge is actually codified and taught. Because the costs of creating and updating tools and systems are likely to be high, the proportion of codified knowledge to what is potentially codifiable might be quite small. The decision to invest scarce managerial resources in knowledge codification processes might therefore be interpreted as a strategically relevant activity, which could significantly affect the development of explicit task-related competence.

As a group produces tools and systems to execute a given task, it will have to evaluate how and why its past decisions and actions for similar situations have influenced performance. This effort will likely improve the quality of the group's understanding of the causes of successes and failures in the task at hand. It will, in other words, increase a firm's capability to plan and manage that particular process. Weick's (1995) work on retrospective sensemaking evokes well how we believe capability building happens in the context we observed. Nevertheless, we do not assume that the group that develops and refines these codes learns intentionally. Firms, or groups of individuals, might very well learn about the drivers of performance in their acquisitions without realizing that they are doing so. For example, the development of an integration manual is normally motivated by the need to coordinate the execution of the huge number of virtually simultaneous activities necessary to align processes in the two organizations. In doing so, however, the acquirer might develop a theory of what decisions are most appropriate in what conditions, therefore unintentionally contributing to the improvement of the understanding of the performance implications of those decisions.

If these arguments are correct, the degree to which past experience is reflected upon, articulated, and codified into ad hoc tools should influence how effective organizational practices evolve. Both tacit experience accumulation and explicit knowledge codification might precede the development of organizational capabilities, at least in the context of infrequent and heterogeneous processes, such as corporate acquisitions (Zollo and Winter, 2002).

We view these two mechanisms as linked, in that the effectiveness of knowledge codification as a learning process depends, to some extent, on the magnitude of accumulated experience (Levitt and March, 1988). Yet they are also theoretically distinguishable because they assume different underlying behavioral and cognitive processes. Although learning-by-doing occurs without explicit resource commitment and intense cognitive effort, articulating and codifying knowledge requires firms to deliberately attempt to improve the odds of success in future repetitions of the task. They can do so only by dedicating time, money, and managerial attention to grasp the causal mechanisms between decisions, actions, and performance outcomes.

This argument suggests that the effects of the *process* of knowledge codification, not necessarily its outcomes, are of strategic relevance. Our argument focuses on the development and refinement of these tools, rather than on these tools' usefulness as repositories of collective memory (Cohen and Bacdayan, 1994; Cohen *et al*., 1997) or as diffusers of organizational knowledge (Nonaka, 1994; Nonaka and Takeuchi, 1995). The process/outcome distinction is important for understanding the source of sustainable advantages firms can derive from their efforts to codify. Although the codification of knowledge reduces the ability of firms to protect their rents from imitation and replication (Winter, 1995) and might induce phenomena of superstitious learning (Levitt and March, 1988), the superior understanding of the action–performance linkages derived from the creation of those tools will not diffuse with the tools. Just as it is not sufficient to send a manual of explanations in order to transfer superior practices (Szulanski, 1997), so it will not be easy for competitors to reproduce the performance of the initial codifier even if they can obtain access to the tools.

Our approach complements the 'recombinatory' (Kogut and Zander, 1992; Grant, 1996; Teece, Pisano, and Shuen, 1997) and modular (Henderson and Clark, 1990; Clark and Fujimoto, 1991; Sanchez and Mahoney, 1996) views of organizational capabilities, which emphasize the manipulation of competence already residing within the

organization. Recombining, integrating, or 'harnessing' (Grant, 1996) current knowledge can and should be distinguished from creating new organizational competence in tasks that bear little relationship with established firm activities. The effectiveness of vicarious learning mechanisms for such tasks is limited by the very nature of the organizational knowledge necessary for their execution: sticky (Winter, 1995; Szulanski, 1997), system-dependent (Winter, 1987), and causally ambiguous (Lippman and Rumelt, 1982). Finally, our approach offers the non-trivial advantage of enhanced measurability, with respect to the notions of combinative and architectural capabilities because experience curves and the existence of codification outputs can be easily quantified with the appropriate methodology.

As do partnering, reengineering, and reorganization processes, acquisitions present a formidable challenge for the firm attempting to develop a specific capability in handling them. First, they occur relatively infrequently and unpredictably, thereby reducing a firm's ability to accumulate large amounts of 'observations' necessary to capitalize on learning-by-doing mechanisms (March, Sproull, and Tamuz, 1991). Second, when they do occur, they present themselves in highly heterogeneous forms and usually present a number of unique challenges to be tackled (Haspeslagh and Jemison, 1991). Third, this activity is inherently causally ambiguous (Lippman and Rumelt, 1982), as the number, simultaneity, and interdependence of the decisions and the actions entailed, particularly in the context of the post-acquisition integration phase, imply an endemic lack of clarity with respect to their performance implications.

Under these conditions, the extent to which acquiring firms codify the knowledge accumulated through past experiences might be a necessary precondition for the development of the ability to manage the acquisition process. By creating and updating tools for executing the different phases of the acquisition (i.e., negotiation, due diligence, integration planning, and implementation), the acquiring firm might be able to form and refine its understanding of the determinants of performance outcomes. If it can, the quality of its decisions and implementation steps should be positively related to the degree to which it codifies knowledge from prior experiences in ad hoc tools. Based on the above arguments, we propose the following hypothesis:

Hypothesis 2: The higher the degree of knowledge codification from previous acquisition experiences, the better the economic performance resulting from the focal acquisition.

Integration capability and task complexity

Supporting our hypothesis about the causal link between knowledge codification and acquisition performance is our observation that intense cognitive efforts are necessary to develop and update acquisition-specific tools that lower the degree of causal ambiguity between decisions and performance outcomes. If our argument is true, then the effectiveness of the investments in deliberate learning processes should increase, relative to the process of accumulating tacit experience, at increasing levels of task complexity (Zollo and Winter, 2002). In other words, the more complex is the task at hand, the higher its causal ambiguity, and the more necessary it will be for the firm to invest in deliberate learning efforts in order to counteract the steeper barrier to the understanding of cause–effect relationships.

A second argument in support of a possible interaction of knowledge codification processes with the degree of complexity of the organizational task has to do with the cognitive simplification entailed by the production of these tools. As Gavetti and Levinthal (2000) show, investments in forward-looking, offline learning efforts should reduce the cognitive complexity of the task at hand by simplifying decision-making and facilitating the coordination of the implementation subtasks.

This second point supplements the argument Adler and Borys (1996) make in their analysis of the conditions under which formalization might be productive. The degree of formalization might therefore represent a key to managing complex contexts if it is enacted within a capability-building approach, thereby *enabling* the achievement of higher levels of understanding rather than *coercing* the actions of the individuals involved. The former approach is more likely to be taken, however, when the learning challenge is greater. Easier tasks might be more frequently approached with coercive, bureaucratic attitudes.

In the acquisition context, the level of post-acquisition integration of the acquired unit within the acquiring firm is inherently tied to the complexity of the organizational task. The higher the level of integration is, the larger is the number

of organizational units and functional departments in both firms that need to coordinate and cooperate in order to achieve the desired structural, operational, and cultural unity. The number, the frequency, and the interdependence of decisions and actions increase correspondingly, perhaps even non-linearly, at increasing levels of intended integration between the two organizations.

Based on the above arguments, we present the following hypothesis:

Hypothesis 3: The impact of the degree of knowledge codification on performance will be stronger when the focal acquisition is managed with a high, as opposed to a low, level of integration.

Performance implications of post-acquisition integration strategies

Knowledge accumulation mechanisms do not, however, solely determine the development of acquisition-specific capabilities; this development is obviously connected to, and is dependent on, the type of integration approach selected by the acquiring firm. Given the system-dependent and causally ambiguous nature of the organizational knowledge necessary to manage an acquisition, acquirers will be able to develop competence only in a fairly narrow knowledge domain, which will likely correspond to the management of a specific kind of acquisition processes. When the characteristics of this process, particularly of the post-acquisition integration phase, change substantially, the acquirer should be considered a novice, regardless of its accumulated experience in substantially different types of acquisitions. It thus has to start accumulating new competencies specific to the new challenges it faces. It is therefore very important to understand the performance implications of post-acquisition integration decisions (Haspeslagh and Jemison, 1991) and to relate them to the capability development process described above.

As discussed in the section on 'The performance of corporate acquisitions,' there appear to be at least two key dimensions of the integration process: the level of organizational integration between the two firms involved in the acquisition, and the extent to which the target's resource endowments, with particular emphasis on the target's top management team, is replaced.

The level of integration

To the extent the acquired firm is integrated within the structures and operations of the acquirer, a number of outcomes are likely to occur. First, consistent with established results on the effects of organizational change on firm survival (Amburgey, Kelly, and Barnett, 1993; Haveman, 1992, 1993), a more extensive integration results in greater disruption of the pre-existing resources and routines in both firms. This disruption is likely to lead to declines in the performance of the combined entity (Marks and Mirvis, 1985; Mirvis, 1985; Schweiger, Ivancevich, and Power, 1987; Buono and Bowditch, 1989, Astrachan, 1990; Empson, 2001).

A second negative consequence of the integration decision relates to its effect on the complexity of the integration process. As argued above, an extensive integration entails a large number of highly interdependent and virtually simultaneous decision-making processes, involving increasing levels of interaction between parts and functions of the two organizations (Kitching, 1967; Jemison and Sitkin, 1986; Pablo, 1994). Consequently, extensive integration makes it harder for acquirers to assess the performance outcomes of the integration process and implies higher levels of risk in the selection of the correct integration approach, as well as in the implementation of the selected approach (Pablo, Sitkin, and Jemison, 1996). Finally, high integration levels translate into increasing explicit and hidden costs relative to the expenses (e.g., training, lay-offs, information systems conversion), to the time and to the degree of managerial attention (Ocasio, 1997) required to design and implement the integration process.

Nonetheless, a higher level of integration between the two firms is necessary in order for the acquirer to realize the potential value of the transaction (Datta and Grant, 1990; Haspeslagh and Jemison, 1991; Shanley, 1994; Capron, 1999). In particular, the positive performance implications of the degree of resource relatedness (Rumelt, 1974, 1984; Chatterjee, 1986; Lubatkin, 1987; Singh and Montgomery, 1987; Chatterjee *et al*., 1992) imply that related acquisitions should be managed with at least a minimum level of organizational integration.

Unfortunately, prior empirical work that has attempted to link the level of integration to performance has not yielded definitive results. Datta

and Grant (1990) did not find statistically significant results for either their overall sample or their subsample of related acquisitions, although their sample of unrelated acquisitions did seem to benefit from lower levels of integration. In contrast, Shanley (1994) found some evidence that positive performance was related to the level of integration. As our study focuses on horizontal and market extension acquisitions, thereby excluding strategic logics related to product diversification, we expect the benefits from economies of scale and scope to emerge only when the operations of the two organizations are integrated extensively, and that these benefits outweigh the negative impacts of organizational disruptions, process complexity, and implementation costs outlined above. Following Datta and Grant (1990) and Shanley (1994), we therefore propose the following hypothesis for empirical testing:

> *Hypothesis 4: The higher the degree of integration of the acquired firm within the acquirer, the better the economic performance of the acquisition.*

The degree of resource replacement

We now consider the relationship between resource replacement and acquisition performance. Of particular interest, given the attention it has received in prior work, is the replacement of the top management team of the target firm. This variable might be also considered a proxy, however, for a more general construct of firm-wide replacement of resources, such as brand names, distribution channels, and physical assets, as an acquiring firm opting for a quick, aggressive, integration process is likely to replace other pre-existing resources within the acquired business that it considers non-vital.

We expect that when more extensive integration is pursued, resource redundancy between the activities of the two organizations is more likely. Nevertheless, given the decisions made on the degree of integration, acquirers still have considerable latitude in deciding *how* to achieve the desired level of integration. For instance, the top management team can be either retained and motivated to cooperate, or replaced with a new team sent from the acquiring firm, regardless of how much autonomy is given to the acquired organization. Also, if the acquisition is primarily motivated by the access to undervalued or underexploited assets, such as brands or location, the decision on the retention of top management is only loosely connected to the one on the degree of integration of the productive assets.

According to proponents of the 'market for corporate control' hypothesis, the better team gains control of the productive assets of the acquired firm by displacing the less competent team (Manne, 1965; Jensen and Ruback, 1983). The acquiring team, according to this argument, needs to believe that it is more competent than the one currently in place in the target firm. As reviewed in the section on 'The performance of corporate acquisitions,' however, prior research suggests that replacing the acquired firm's top management will result in reduced economic performance because it entails the loss of human and social capital caused by the departure of top executives. Empirical studies have found that managerial turnover reduces acquisition performance (Cannella and Hambrick, 1993; Krishnan *et al*., 1997), lending support to a negative sign of the causal link.

In an effort to find an integrative solution to this debate, we are interested in identifying a moderating variable that might function as a 'switch' in the sign of the relationship and that might have been left out of the theoretical discourse so far. To this end, an obvious moderator of the impact of top management on performance is the quality of the assets of the acquired firm. Replacing the target's top management might be connected with enhanced performance if the acquired firm is characterized by poor quality of its resources (and presumably of its pre-acquisition performance), since the advantages of establishing a better management team might outweigh the potential disruptions to routines and motivation within the acquired organization. Conversely, replacing the management team of better performing acquired firms is likely to be detrimental to the performance of the combined entity. If this is the case, then we can propose the following hypothesis based on the interaction between the replacement decision and the quality of the pre-acquisition performance of the acquired firm:

> *Hypothesis 5: The higher the pre-acquisition performance of the acquired firm, the worse the impact of the replacement of top management in the acquired firm on the economic performance of the acquisition.*

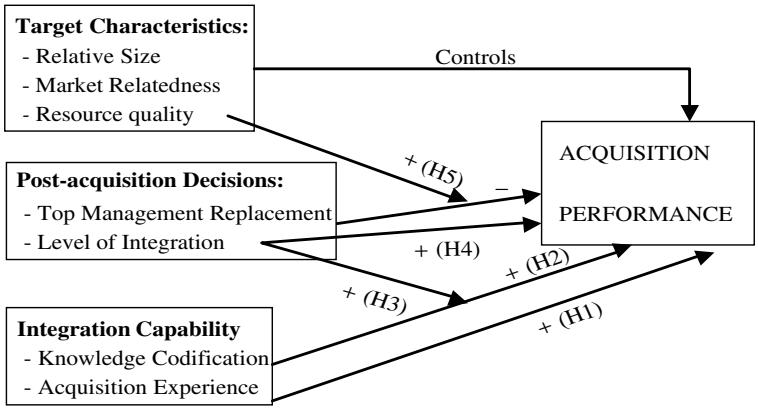

Figure 1. Model and hypothesis

Figure 1 summarizes the causal relationships discussed and the research hypotheses advanced.

RESEARCH METHODOLOGY AND MEASURES

The research setting

We tested these hypotheses on a large sample of acquisitions in the U.S. commercial banking industry. This setting was deemed to be particularly well suited for our research purposes for several reasons. First, by holding the industry constant, we ensured that the population of firms from which we drew our sample was relatively uniform in the environmental conditions that it faced. Of course, the price paid was a reduction in the degree of generalizability of our results, at least beyond the banking sector. Second, this industry underwent a period of rapid consolidation in response to changes in regulation that allowed banks to cross state lines in the early 1990s. This institutional change created a sufficiently large universe of potential observations in a relatively compact timeframe. Third, given the relevance of acquisition-driven growth in the industry, it was easier to find firms that would grant us access and participate in our survey. Finally, banking has been the most active industry in terms of acquisition volumes since the beginning of the 1990s; its share of the total domestic volume of acquisitions was estimated to be about 25 percent during the first half of the decade.

The research design involved two phases: initial fieldwork to gain a deeper understanding of the integration process in this industry, and a larger questionnaire-based sample study of post-acquisition practices and performance. For the initial field research, we obtained access to 12 banks, all of which were active acquirers. We interviewed 45 decision-makers in these banks to obtain a better understanding of how they handle integration challenges and attempt to distill useful lessons from their prior acquisition experiences. In analyzing the content of these interviews, we made the following observations:

1. Most acquisitions made prior to 1990 were managed as virtually autonomous affiliates. Acquired firms' information systems were not changed significantly, and their top management teams were typically not replaced.
2. During the 1990s, acquiring banks have increasingly sought to obtain cost efficiencies by integrating the operations of the acquired bank into their own, by standardizing products of the combined organizations, and by converting information systems.
3. Acquirers varied in how they managed acquisitions not only longitudinally (increasing levels of integration over time) but also cross-sectionally. Some acquirers allowed the acquired units to remain relatively autonomous, and typically retained their top management. Banc One was an example of this approach to managing acquisitions. On the other hand, equally experienced acquirers used substantially different approaches to manage essentially the same types of task by integrating and/or replacing existing resources to a much greater extent. Nationsbank (now Bank of America)

was considered one of the champions of this more aggressive approach.

4. Finally, we were surprised to witness how extensively some acquirers had codified the integration process, and the large cross-sectional variation that different acquirers exhibited along this dimension. Experience levels seemed to explain part, but not all, of this variation, as we found several inexperienced acquirers with highly sophisticated integration tools and highly experienced ones with only average levels of codification. Also, the development of integration-specific tools went beyond the predictable, industry-specific challenges related to the conversion of the IT systems, and spanned issues of human resources management, customer communication and retention, and general project management systems.

The large sample study was then conducted in 1996, with a survey of the 250 largest bank holding companies in the United States, covering more than 95 percent of the industry's assets. The asset size of the smallest institution was about $400 million, which implies very rare acquisition activity and very small transaction sizes (usually one or two branches). Further extensions of the sample to smaller institutions would probably have resulted in very few responses because of the scarcity of acquisitions in such firms' histories, and in low comparability among the observations in the sample due to the large size differentials.

The survey consisted of two parts: The Acquisition History Profile and The Acquiring Bank Questionnaire. The Acquisition History Profile was a list of all acquisitions conducted by the bank, with basic information about each of them, such as their asset size, the degree of market overlap, pre-acquisition profitability, level of integration, and the replacement of the top management team. The Acquiring Bank Questionnaire described characteristics of the acquisition process at the firm (rather than the transaction) level of analysis, including the type and the time of creation of acquisition support tools such as integration manuals, system conversion manuals, product mapping models, training packages, project management tools and other items. Of the 250 bank holding companies contacted, 70 did not make any acquisitions after 1985, and 16 were acquired during the survey process. Of the remaining 164 banks, we obtained responses from 51, translating into a response rate of 31.7 percent. This response rate is satisfactory given the complexity of the survey and the involvement of top management in responding to the survey.

The respondents to the survey were senior executives at the acquiring bank with direct experience in the coordination of the acquisition process. Due to variation in how firms were organized, we contacted each potential respondent before the mailing in order to identify the best respondent within the bank. The respondents included the manager responsible for corporate development and acquisitions (26 institutions), the coordinator of post-acquisition integration processes (14 institutions), the CFO (eight institutions), and the CEO (in three cases of smaller institutions).

Four responses had to be excluded from the analysis because the data they supplied were seriously incomplete. The remaining 47 institutions had completed 577 acquisitions, for an average of 12.3 each. Standard mean comparison tests were used to check for response bias. The responding organizations were not significantly different from the original set of 250 organizations in terms of return on assets, return on equity, or efficiency ratios, although they tended to be larger in terms of asset size ($p < 0.05$).

Measures

Dependent variable: performance

Acquisition performance is measured as the difference between return on assets (ROA) of the acquiring bank 3 years after the acquisition vs. the same measure 1 year before the acquisition. The acquired banks in our study were very often consolidated, from an accounting standpoint, into the acquiring banks, leaving us unable to analyze the target's post-acquisition performance. Also, the vast majority of acquired firms were privately held community banks, whose accounting returns were not publicly available even before the acquisition. We therefore resolved to utilize a measure based solely on the acquiring bank's pre- and post-acquisition performance, and then collect a qualitative assessment of the target's pre-acquisition performance to use as a control variable.[4]

[4] See also our discussions in the section presenting the Results for the robustness checks of our results, where we validate this measure with a smaller subsample of observations for which we

In addition to these measurement problems, our interest in the performance implications of integration decisions and learning processes in the acquiring firm meant it was appropriate to use performance measures related to the acquirer. The influence of pre-acquisition performance and size of the acquired unit are explicitly controlled for in the multiple regression model. In order to control for competitive conditions in the acquirer's market, we adjusted the acquiring bank's return on assets against the performance of its peers in the same geographic area.[5]

The change in performance over time is then expressed as

$$\text{Change in ROA} = (\text{ROA}_{i,t+3} - \text{ROA}_{c,t+3}) - (\text{ROA}_{i,t-1} - \text{ROA}_{c,t-1})$$

where $\text{ROA}_{i,t+3}$ and $\text{ROA}_{i,t-1}$ = return on assets of acquiring bank i in years $t+3$ and $t-1$ respectively, and $\text{ROA}_{c,t+3}$ and $\text{ROA}_{c,t-1}$ = average return on assets in the same geographic area as that of the acquiring bank i at years $t+3$ and $t-1$ respectively.

The accounting data were collected from 1985 to 1997 with the use of three different databases (Compustat, Compact Disclosures, and Moody's) in order to maximize the coverage of the banking sector. The coverage of the banking sector (for both respondents and non-respondents) was significantly lower for the years prior to 1985. Extending the data set would have implied a significant loss of comparability among the institutions surveyed as well as consistency among the observations between the first and the last years of the period. Given the construction (3-year average) of the dependent variable, the years 1985, 1995, 1996, and 1997 were lost, thus restricting the period of observation to acquisitions completed between 1986 and 1994.

could construct a weighted average of both banks' ROA before the acquisition. The two measures are essentially equivalent for all practical purposes.

[5] Seven geographic areas in the United States (New England, North Atlantic, South Atlantic, Mid-west, South, Rocky Mountains, and Pacific) and one in Canada were used to benchmark performance.

Explanatory variables

Knowledge codification is measured as the sum of acquisition tools developed by the acquiring firm at the time of the focal acquisition. The tools are specific to different parts of the acquisition process, including financial evaluation, due diligence, conversion of information systems, human resources integration, and sales/product integration. The information was gathered through the Acquiring Bank Questionnaire, which asked whether the following items were developed and, if so, when they were developed:

Documents/Manuals: Due diligence checklist, Due diligence manual, Systems conversion manual, Affiliation/integration manual,[6] Systems training manual,[7] Products training manual.[8]

Quantitative Models: Financial evaluation, Staffing models, Product mapping,[9] Training/Self-training packages, Project management.[10]

Acquisition experience is computed as the number of acquisitions completed by the acquiring firm before the focal acquisitions. The Acquisition History Profile collected the list of all the acquisitions completed by the responding institution since founding or since a merger of equals. The oldest acquisitions in the data set were completed in 1968 (by Banc One and Crestar Bank). Although the analysis is based on the observations between 1986 and 1994 (see above), the History Profile allowed us to construct the complete stock of prior acquisition experience for each of the observations in the analysis. The measurements of the two capability-building mechanisms, as well as of the dependent variables, are therefore comparable across firms.

Integration was measured with a single scale collected with the Acquisition History Profile instrument. For each acquisition they completed since their founding, respondents answered the following question:

[6] Such manuals describe all the procedures necessary to accomplish the desired level of integration between the two organizations. They usually cover issues such as human resources, accounting, audit, and CRA.

[7] These manuals describe how to train the DP users at the acquired company. They are 'train-the-trainer' tools.

[8] These manuals describe how to train the sales force at the acquired company.

[9] These packages allow thorough comparison of the features of the acquired bank's products with those of the acquirer.

[10] These models assign tasks, requirements, and deadlines, allowing careful planning and control of complex projects.

Integration. To what extent were the systems, procedures and products aligned or centralized?

*Possible answer*s were: '**0**' (few or no features were aligned or centralized), '**1**' (if only selected systems, procedures or products were aligned or centralized), '**2**' (many but not all systems, procedures, and products were aligned or centralized), and '**3**' (all systems, procedures, and products were completely integrated).

Replacement was measured with a similar four-point scale, where respondents answered the following question:[11]

Change. To what extent has the executive leadership of the acquired bank been changed after the acquisition?

Alternative answers were: '**0**' (no substantial change), '**1**' (some changes), '**2**' (many changes), and '**3**' (virtually all the top management team was changed).

Controls

Relatedness

The research design called for limiting the variation in the degree of relatedness between the two organizations to the geographic dimension. The construct was therefore measured with a dummy variable identifying either horizontal acquisitions (or 'in-market' in the banking terminology), coded as '1', or market extension acquisition (or 'out-market'), coded as '0'. This measure is a good proxy for market relatedness in the banking industry, given the importance of geographic location as a key competitive factor and the importance of rationalizing the branch network in order to create value from acquisitions through cost efficiencies. In terms of value creation mechanisms, in-market acquisitions generally prioritize cost efficiencies driven by economies of scale, whereas 'out-market' acquisitions tend to rely more on cross-selling opportunities and economies of scope since many of the cost-efficiencies derivable from the rationalization of the two branch networks are not available.

Resource quality

In order to isolate the effect of the resource replacement variable, we assessed the pre-acquisition quality of the acquired firm's resource endowment. The construct was measured by asking about the performance level of the target bank prior to the acquisition. The scale anchors were: '−2' (the acquired institution was bankrupt), '−1' (it was a poor performer), '0' (it was an average performer), '+1' (it was a good performer) and '+2' (it was an outstanding performer).

Other controls included the asset size of the acquiring firm, the relative asset size of the acquired firm with respect to the acquirer, and the number of acquisitions completed by the responding bank during the same year of the focal acquisition.

Construct validity

We tested the validity of our measures of integration, replacement, relatedness, and resource quality using multiple item scales we developed for a subsample of 57 acquisitions. For this subsample, we had multiple indicators for resource relatedness (8 items), resource quality (11), managerial replacement (9), and the degree of integration both as product and process alignment (8) and as functional centralization (7, with a total of 15 items for the integration construct). Comparisons of the means between this subsample and the entire database of acquisitions did not indicate any bias for these constructs. We used three tests to check the validity of our measures; (1) Cronbach alphas of the multiple items, (2) correlation between the scale used in the study and the sum of the z-scores of multiple items, and (3) correlation between the scale used in the study with the main factor extracted from the multiple items.

Results indicate that the measures used in the empirical analysis are generally valid representations of the underlying constructs utilized in the theoretical treatment of acquisition performance. For our measure of top management replacement, the Cronbach alpha, correlation of the scale with the sum of the z-scores for the multiple items, and the correlation between the scale and the main factor are 0.826, 0.606 ($p < 0.01$), and 0.549 ($p < 0.01$), respectively, all of which indicate that

[11] The use of the word 'replacement' was deemed too negative. We therefore substituted the word 'change' without significantly altering the meaning of the question. Note that the use of the phrase 'has been changed,' rather than 'has changed,' implies an active role of the acquirer in substituting the top management of the acquired bank. We are likely to capture, therefore, deliberate lay-offs by the acquirer as opposed to retention problems.

our scale for the replacement of top management is valid. For the degree of integration, the same statistics are 0.950, 0.521 ($p < 0.01$), and 0.542 ($p < 0.01$), all of which indicate that our integration scale is valid. We also validated our resource quality construct (Cronbach alpha = 0.853; correlation with the sum of the z-scores for the multiple items = 0.463, $p < 0.01$; correlation with the main factor = 0.482, $p < 0.01$). The only item that was not validated was the approximation of resource relatedness with the single measure of market overlap (in-market vs. out-market acquisitions). Nonetheless, the single measure does correlate strongly with a more focused set of items related to the degree of overlap in terms of branch network and customer base (0.520, $p < 0.01$). Consequently, we replaced the general notion of resource replacement with the narrower concept of market relatedness in our interpretations of the results of this analysis.

The model

The model being tested in this study is specified as follows:

$$\begin{aligned}\text{Change in ROA} = {} & a + b^{*}\text{integration} \\ & - c^{*}\text{replacement} + d^{*}\text{codification} \\ & + e^{*}\text{experience} \\ & + f^{*}\text{codification} \times \text{integration} \\ & + g^{*}\text{replacement} \times \text{quality} \\ & + \text{controls} + \varepsilon\end{aligned}$$

The error term is distributed according to the standard normality assumptions.

The estimation method used is ordinary least squares. All variables utilized to construct the interaction terms were standardized so as to eliminate the initial multicollinearity problem in the estimated model. With this correction, the maximum variance inflation factor (VIF) across the covariates was 2.591, which is significantly below the rule of thumb of 10 used to detect multicollinearity problems (Neter, Wasserman, and Kutner, 1985). We also checked the stability of the coefficients to different specifications of the model, dropping one of the post-acquisition decisions or one of the (highly correlated) resource characteristics of the acquired firm, and found no important variations to the magnitude and statistical significance of the coefficients. Four observations were identified as outliers (>3 S.D.) and were excluded from the analysis. The only other violation of standard normality assumptions that we could find was related to a possible correlation of the error terms stemming from the multiple observations for each responding institution. We dealt with this concern through a specific set of analyses reported in the next section.

RESULTS

Table 1 reports descriptive statistics and the correlation matrix for the data used in this study. Consistent with the prior literature on mergers and acquisitions, we find that the mean for the performance variable (−0.004) is not statistically distinguishable from zero. The correlation table indicates that the dependent variable is significantly correlated with virtually all of our explanatory variables, with the notable exception of acquisition experience. Many of our explanatory variables are also correlated with each other. We thus used a multivariate analysis to identify the net influence of each variable on acquisition performance.

The results of the regression analysis of the model described earlier are reported in Table 2. The six nested models presented allow the effect of each group of variables on acquisition performance to be identified. The models fit with the data reasonably well, as shown by the strongly significant F-statistics ($p < 0.001$) and by the increasing adjusted R^2 statistic (0.165 in the full model). The incremental F-statistic (not reported) is statistically significant in each model, with the exception of the one introducing the level of acquisition experience. The two focal post-acquisition decisions appear to impact the variation in acquisition performance more strongly than any of the other sets of explanations. We enter the two decisions simultaneously in Model 3 because of their relatively high correlation ratio; a sequential entry would not have changed the results in a substantive way, but would have shown a biased estimate of the coefficient of the first decision entered, since part of the variation of the second decision would have been picked up. The organizational learning variables, as well as the pre-acquisition resource characteristics, which we entered separately because of their theoretical relevance, show mixed results, with only one of the two variables

Table 1. Correlation matrix

	Variables	Avg.	Std	1	2	3	4	5	6	7	8	9	10
1	Acquisition perf. ch. in ROA (3 years)	−0.004	0.3518										
2	Acquirer's size	23.137	23.08	0.084									
3	Relative acquisition size	6.108	11.45	−0.013	−0.075								
4	Simultaneous acquisitions	3.589	2.836	***0.235***	***0.481***	***−0.223***							
5	Resource quality	−0.017	1.06	−0.070	−0.048	0.052	0.051						
6	Market relatedness	0.61	0.49	0.040	***0.178***	−0.080	***0.144***	***−0.201***					
7	Level of integration	2.635	0.703	**0.115**	0.089	−0.090	***0.172***	***−0.213***	***0.396***				
8	Degree of replacement	1.76	1.28	***−0.230***	−0.067	0.019	***−0.210***	***−0.309***	***0.352***	***0.417***			
9	Acquisition experience	11.34	10.17	0.026	***0.502***	−0.090	***0.515***	0.036	***0.170***	**0.118**	−0.057		
10	Knowledge codification	4.877	3.676	**0.146**	***0.436***	−0.052	***0.360***	***0.175***	0.026	0.078	**−0.109**	***0.455***	
11	Codification × Integration	0.173	1.155	**0.143**	−0.023	0.072	0.047	0.063	−0.009	***−0.154***	**−0.111**	−0.066	***−0.176***

Pearson's correlation. Bold numbers are significant at the 5% level; bold and italic ones are significant at the 1% level.

Table 2. Acquisition performance: transaction level of analysis

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Controls						
Acquirer's size	−0.031	−0.044	−0.064	−0.054	−0.127	−0.118
Relative acquisition size	0.072	0.065	0.080	0.077	0.096	0.072
Simultaneous acquisitions	0.298***	0.308***	0.129	0.149	0.155	−0.113
Target quality		−0.136**	−0.18***	−0.179***	−0.221***	−0.227***
Market relatedness		0.001	0.062	0.064	0.068	0.061
Post-acquisition decisions						
Level of integration			0.181**	0.174**	0.176**	0.185**
Degree of replacement			−0.344***	−0.339***	−0.338***	−0.336***
Integration capability						
Acquisition experience				−0.037	−0.098	−0.081
Knowledge codification					0.198**	0.207***
Codification × Integration						0.142**
F-statistic	6.024***	4.544***	5.976***	5.234***	5.455***	5.506***
Adjusted R^2	0.062	0.072	0.133	0.129	0.150	0.165
N	228	228	228	228	228	228

Ordinary least squares estimation. Standardized beta coefficients: significant at the 1% (***), 5% (**) or 10% (*) level.
Dependent variable: change in ROA 3 years after the acquisition vs. the year before, minus same variation in local competitors' ROA.

significantly influencing performance. The stability of the coefficients across the models, as well as customary controls of VIF and tolerance ratios, shows that multicollinearity problems, which could arise from high correlations among groups of variables, are not present in this sample.[12]

The analysis indicates that Hypothesis 2, which posits a positive relationship between knowledge codification and performance, is strongly supported ($p < 0.01$). In addition, the interaction between knowledge codification and the level of integration is statistically significant at the 5 percent level, supporting Hypothesis 3. The fact that the creation of these tools shows increasing influence on acquisition performance at increasing levels of integration (i.e., task complexity) empirically supports our argument about the role of deliberate learning efforts in the development of integration capabilities.

In contrast, the accumulation of tacit knowledge through acquisition experience turns out to be a non-significant predictor of performance, failing to support Hypothesis 1. This finding confirms the mixed results of the received literature on the performance implications of accumulating acquisition experience. The data analyzed suggest that in the context of relatively infrequent, heterogeneous, and causally ambiguous tasks,[13] organizations develop competence primarily by articulating and codifying knowledge derived from previous acquisition experiences. Simple exposure to acquisition processes does not seem to suffice.

Hypothesis 4, suggesting that the level of integration is positively associated with changes in performance, is supported at the 1 percent significance level. Regarding the performance implications of top management replacement, we first note that the direct effect is negative and significant at the 1 percent level, lending further support to the 'organizational disruption' view (Cannella and Hambrick, 1993) vs. the 'market for corporate control' perspective (Manne, 1965; Jensen and Ruback, 1983). The strength of the result was surprising, given theoretical arguments supporting both a positive and a negative impact for this decision. However, this result could be explained by the presence of a larger number of good performing targets in the sample analyzed. According to Hypothesis 5, in fact, the pre-acquisition performance levels of the acquired firm should moderate the relationship between replacement and acquisition performance.

[12] Particularly important is the stability of the coefficients across Models 4, 5, and 6 despite the significant correlation between acquisition experience and knowledge codification.

[13] Note that the assessment of acquisitions as infrequent and homogeneous tasks needs to be viewed in comparative terms with respect to more standard organizational activities, such as operating or administrative tasks.

In order to probe this, we added the interaction term between replacement and the resource quality assessment of the acquired bank. In addition, we split the dataset into three subsamples by separating our observations into low (i.e., response = −2 or −1), average (response = 0), and high (response = +1 or +2) resource quality. Table 3 reports the results of OLS estimates with the full model including the interaction term, as well as for the three subsamples. As Hypothesis 5 proposes, the interaction term is strongly significant and negatively related to performance, indicating that top management replacement is increasingly correlated with poorer performance when the resource quality of the acquired unit increases. More interestingly, though, the strongest negative effect of the replacement decision is found for observations with an average quality of resources, though it would be logical to expect a stronger negative effect for observations with the highest quality of resources. At low quality levels, the replacement decision takes on a positive sign, as per the 'market for corporate control' hypothesis, but does not reach statistical significance.[14]

One possible explanation for this non-linearity in the TMT replacement coefficients could be provided by the fact that the uncertainty about the performance implications of replacement is highest at intermediate levels of pre-acquisition performance. Also, the model seems to fit the data very well for low and average performing targets, but not for high-quality ones. This might be a consequence of the paucity of degrees of freedom (only 55 observations) and a possible overspecification of the model. It might also be, though, that some of the prescriptions valid for the acquisition of 'normal' targets might not transfer to high-quality ones. Cost efficiencies from the integration of high-quality targets, for example, might be effectively counterbalanced by higher hazards of disruption of superior routines. In terms of learning, the advantages

[14] These results are confirmed by a Chow test analysis on the replacement coefficient as well as on the entire model. For the entire model, the average level of resource quality changes the slope significantly *vis-à-vis* the other two levels ($F = 6.595$, $p < 0.001$), the high-quality model adds some additional shift but is only marginally significant ($F = 1.661$, $p < 0.10$), whereas the low-quality coefficients do not differ from the others in a statistically significant way ($F = 1.235$). Similarly, the single coefficient of TMT replacement shows the strongest negative impact in the interaction with the average quality dummy ($t = -5.134$, $p < 0.0001$), followed by the high-quality one ($t = -2.113$, $p < 0.05$), with the one with the low-quality resources indeed switching sign but failing to reach statistical significance ($t = +0.466$).We wish to acknowledge that the results on the interaction effect between replacement and resource quality were the consequence of one reviewer's insightful comments and generous advice, for which we are particularly grateful.

Table 3. Test for interaction between TMT replacement and target quality

	Interaction term	Low quality	Avg. quality	High quality
Controls				
Acquirer's size	−0.061	−0.031	−0.152	−0.031
Relative acquisition size	0.061	0.032	−0.034	0.193
Simultaneous acquisitions	0.044	−0.022	−0.041	0.064
Target quality	−0.151**			
Market relatedness	0.082	−0.122	0.133	0.183
Post-acquisition decisions				
Level of integration	0.309***	0.397***	0.365***	0.091
Degree of replacement	−0.401***	0.144	−0.621***	−0.359**
Integration capability				
Acquisition experience	−0.095	−0.140	−0.037	0.013
Knowledge codification	0.151**	0.226*	−0.014	0.153
Codification × Integration	0.168***	0.255**	0.081	0.263*
Replacement × Quality	−0.228***			
F statistic	7.131***	2.61***	5.963***	1.253
Adjusted R^2	0.221	0.148	0.314	0.040
N	238	83	98	55

Ordinary least squares estimation. Standardized beta coefficients: significant at the 1% (***), 5% (**) or 10% (*) level.
Dependent variable: change in ROA 3 years after the acquisition vs. the year before, minus same variation in local competitors' ROA.

of knowledge codification might be reduced outside the more routinizable case of restructuring poorly performing targets.

Compared to post-acquisition decisions, and knowledge codification, the characteristics of the pre-acquisition resources of the target, resource quality, and market relatedness, show weaker explanatory power, with the market relatedness measure showing no statistically significant effect. This finding is puzzling from a theoretical standpoint, because the potential for economies of scale should be significantly superior for horizontal acquisitions than for market extension ones, as the overlap of two branch networks typically allows efficiency gains from rationalization. One interpretation might be that acquirers can create or destroy value equally well through cost rationalizations, typically prioritized in 'in-market' acquisitions, or through revenue enhancement processes, which become the priority in market extension acquisitions.

Resource quality consistently impacts performance negatively, indicating that the acquisition of well-performing targets is less likely to enhance acquirers' performance than is the acquisition of poorly performing ones. This result can be interpreted in two ways: first, in terms of directionality of the knowledge flows between the acquiring and the acquired firm. Consistent with Capron's (1999) results on the performance implications of resource redeployment to and from the target, our finding can be interpreted as showing that the transfer of resources and capabilities from the acquirer to the target (i.e., the cases in which the target quality is low) outperforms the opposite mechanism, through which the acquirer 'learns' from the (highly performing) acquired entity. The second interpretation refers to increasing levels of resistance to change that can be expected to occur as the levels of pre-acquisition performance of the acquired firm grow. The better the acquired firm performed before the acquisition, the stronger the confidence its managers will have in the superior quality of its processes and the less willing they will be to accept the changes required to align processes and procedures across the two organizations. Interestingly, this result also replicates findings in prior finance literature on U.S. bank mergers studying short-term stock price reactions to merger announcements (Hawawini and Swary, 1990).

None of the other variables entered as controls in the model—acquirer's size, acquisition relative size, and the frequency of simultaneous acquisitions—significantly influences performance, further suggesting that the variables considered in our theoretical discussion are meaningful and relevant to the explanation of acquisition performance.

Robustness of results

As we noted in the previous section, the error terms in our estimates of the model may not be independently distributed because we have multiple observations from the same responding institution. In order to address this problem, we replicated the analysis by aggregating the data in two different ways: the firm/year level of analysis, where all acquisitions in the same year by the same firms were averaged, and the firm level of analysis, where all the acquisitions completed by the same firm were aggregated. Weighted least squares estimations (where weights are assigned by the number of acquisitions completed by the same bank over the period of observation) at these two levels of analysis yield results that are consistent with the ones described above, in spite of the significantly lower number of degrees of freedom.[15] The result offers further evidence that the estimated model accurately characterizes this sample (see Table 4). Using firm-level dummies to control for firm effects was not appropriate, as they would have picked up the measurement errors of our main theoretical variables (experience accumulation and knowledge codification). Also, although firm controls might alleviate this problem, the aggregation of the data eliminates it by making only one observation available for each respondent.

Another issue of concern was related to our measurement of the dependent variable, which did not include the ROA of the acquired bank before the acquisition, while the post-acquisition value included the acquired unit. In response to one of the reviewers' suggestions, we collected pre-acquisition ROA data for all the acquired banks we could find (only 79 complete observations) and

[15] Our sample size dropped from 47 to 31 banks because a lot of institutions completed their acquisitions only in the last 3 years of the observed period (1985–97), and therefore are missing from the analysis. Also, the aggregation process was restrictive, in the sense that any bank with one missing value in any one of the acquisitions completed was removed from the analysis.

Table 4. Acquisition performance: firm level of analysis

Variable	Model 1	Model 2	Model 3	Model 4
Resource-based factors				
Quality of assets (avg.)	−0.259	−0.310	−0.315	−0.549***
Market relatedness	0.250	−0.013	−0.031	0.109
Post-acq. decisions				
Integration		0.559***	0.546***	0.518**
Replacement		−0.292	−0.259	−0.292
Integration capability				
Acquisition experience			0.066	−0.068
Knowledge codification				0.515***
F-statistic	3.068*	4.368***	3.408**	5.364***
F improvement	3.068*	4.853**	0.130	9.546***
Adjusted R^2	0.118	0.303	0.280	0.458
N	31	31	31	31

Weighted least squares estimations. Standardized beta coefficients. Significant at the 1% (***), 5% (**) or 10% (*) level.
Dependent variables: avg. change in ROA over the period of analysis.
Note: Due to the low *N*, variables that had no significant effect in previous analyses were omitted in order to save d.f.

constructed a measure of acquisition performance, which included the asset-weighted average of ROA for the two banks 1 year before the acquisition. The correlation of the resulting measure with the one utilized in the reported analysis is 0.972 ($p < 0.0001$), confirming that the two approaches provide almost identical estimates of the dependent variable.

CONCLUSIONS

This paper has discussed how post-acquisition decisions and capability-building processes affect the economic performance of corporate acquisitions. We proposed a knowledge-based perspective of acquisitions, which builds on the intuition that in order to enhance acquisition performance acquiring firms need to not only select the appropriate mix of integration decisions but they have to simultaneously develop the organizational capability to implement it. We drew upon multiple theoretical traditions, using resource-based, process-based, and evolutionary economics arguments to enrich the existing literature on the knowledge-based view of the firm (Kogut and Zander, 1992; Grant, 1996). One crucial insight, which seems to be supported by our data, is that firms develop collective competence by not only accumulating experience but also investing time and effort in activities that require greater cognitive effort in order to produce enhanced awareness of action–performance linkages.[16] Firms learn directly by articulating and codifying the lessons they learned from previous experiences, even if they might not be aware of the positive learning spillovers from these activities. At an extreme, the benefit in creating and fine-tuning acquisition-specific tools might lie more in the learning achieved through the creative process itself than in the use of the outputs as coordination and implementation support devices.

The results of the analysis also suggest that the 'process view' of acquisitions (Jemison and Sitkin, 1986; Haspeslagh and Jemison, 1991; Pablo, 1994; Pablo *et al*., 1996), which emphasizes the role of the integration phase is relevant to consider in understanding the performance of the entire acquisition process. Although the results of prior attempts to relate the level of integration to performance are equivocal, our finding suggests that, at least in the banking industry, which has a trend of efficiency-driven consolidation, the benefits from cost efficiencies gained through higher levels of integration might be greater than the costs inherent to the integration process (e.g., routine and competence disruptions, increased process complexity, and hidden implementation costs). Thus, in this setting, the negative consequences typically

[16] As Zollo and Winter (2002) noted, deliberate learning efforts are not to be viewed as systematically superior mechanisms for capability development. In tasks more frequent, less heterogeneous and less causally ambiguous than the type studied, the costs connected with knowledge articulation and codification processes may overcome the benefits firms derive from them.

attributed to post-acquisition integration processes within the human resources management and organizational behavior literature do not systematically occur (Marks and Mirvis, 1985; Mirvis, 1985; Schweiger *et al*., 1987; Buono and Bowditch 1989; Astrachan, 1990).

In addition, we tested for the direct effect of the replacement of top management in the acquired firm on acquisition performance, as well as the influence that the pre-acquisition performance of the acquired firm has on the strength of the relationship. Our results show that the main effect of the replacement decision in the context studied is negative and significant, and that pre-acquisition performance impacts the relationship in the hypothesized sense but in a non-linear way. The negative impact of top management replacement on performance is maximum at intermediate levels of pre-acquisition performance, rather than at high levels. Moreover, the sign of the impact switches to positive with low-performing targets, but does not reach statistical significance. Taken together, these results confirm the value of searching for an integrative solution to the debate in the literature on the view of acquisitions as policing mechanisms for agency problems in the 'market for corporate control.' Results seem to indicate that this view might be applicable only to the case of under-performing targets, but applying its tenets to cases of average (as well as superior) performers might lead to lower performance for the combined organization.

The knowledge-based variables in the model show interesting effects. The degree of codification has a strong and positive influence on acquisition performance; as the first of its type, this finding merits subsequent research to test for its generalizability. In contrast, the impact of experience accumulation is non-significant. This latter result adds to a series of mixed findings on experience accumulation in these types of tasks. Learning curve effects in the context of highly infrequent and heterogeneous events such as those studied[17] might be heavily attenuated as the hazards of erroneous generalization from the lessons it learned in past contexts to seemingly similar but inherently different ones are correspondingly high (Cormier and Hagman, 1987; Cohen and Bacdayan, 1994; Haleblian and Finkelstein, 1999; Levitt and March, 1988).

Importantly, and central to our arguments on the co-evolution of integration decisions and capability building processes, the interaction between the degree of codification and the level of integration positively and significantly influences acquisition performance. At increasing levels of complexity, the benefits of explicitly extracting lessons learned from previous experiences appear to exceed the costs connected to codification activities (e.g., investment in time, effort, and managerial attention). This result is important because it is direct evidence of the relationship between acquisition capabilities and the management of more complex integration decisions, and may explain why a large number of integrations (even simpler ones) are not successful. Recent related research is examining the role of post-acquisition organizational decisions in influencing product performance in knowledge-intensive acquisitions, another domain replete with instances of post-acquisition failure (see, for example, Puranam, Singh, and Zollo, 2004).

We also introduced the type of acquisition (horizontal or market extension) as an important control variable in the analysis. The lack of significant performance implications for this variable is interesting. *Ex ante*, one could argue that acquiring a competitor in the same geographic area would create higher potential for efficiency-driven cost reductions. Such acquisitions might, however, require more complex integration efforts in terms of the number of potential overlaps of resources and activities across the organizations and the consequently large array of simultaneous, interdependent decisions and actions necessary to accomplish this integration. Therefore the characteristics of pre-acquisition resources might not necessarily predict post-acquisition performance. Instead, the set of post-acquisition decisions about manipulating those resources, the capability to do so that the acquiring firm eventually develops, and the fit between these two factors, seem to matter most. It is important to note, however, that our sample deliberately excludes product extensions and unrelated acquisitions, so the range of variation on acquisition type is less extensive than it is in most other studies.

This study has other limitations. It is a single industry study, focusing on U.S. bank mergers.

[17] Again, note that the characterization of acquisitions as infrequent and heterogeneous tasks is made in comparative terms, *vis-à-vis* normal operating or administrative activities, the typical subject of received studies in learning curves.

Its applicability to other industries and other geographic and institutional contexts needs to be, therefore, closely examined. This problem might be particularly relevant for the generalizability of the performance implications of integration decisions. The results related to the capability-building mechanisms might be more safely extended to other types of acquisitions, and in fact to similarly complex organizational tasks, such as alliances and internal restructuring processes, as long as they maintain comparable levels of (in)frequency, heterogeneity and causal ambiguity. Importantly, the study is also based on a limited definition of acquisition performance, which emphasizes the variation in performance of the acquiring firm. The measurement of the dependent variable, based on accounting data, could also be effectively corroborated with other proxies.

This study of acquisitions attempts to bridge and integrate different theoretical approaches to the highly visible phenomenon of corporate acquisitions. In spite of the economic relevance of the phenomenon, when firms turn to academia for some guidance on how to improve their chances of creating value from their investments, they are typically met with a set of highly segmented recommendations. Finance scholars point to the fact that acquisitions on average do not create abnormal returns for the acquirers, raising questions of acquirers' motives for engaging in these transactions. Strategy scholars are slightly more optimistic, distinguishing between more sensible (i.e., related) and less sensible (i.e., unrelated) types of investments. Finally, scholars in organization studies emphasize the hardships connected with the effective management of the integration phase, the disruption of existing resources and competencies, and the loss of managerial and operational talent.

We hope this study will help to signal the advantages of leveraging different theoretical perspectives in offering managers a more clearly defined and useful account of the conditions under which competitive advantage can be gained or destroyed in acquisition activities. Acquisitions, like any other challenging organizational task, can be effectively managed in a consistently value-creating way, if the conditions enabling performance enhancement are correctly identified and exploited. Even more importantly, firms seem to be capable of developing specific capabilities that allow them to improve their chances of success over time. The data analyzed in this study show that deliberate learning processes, as opposed to semi-automatic (e.g., learning-by-doing) ones, play an important role in predicting acquisition performance, providing some indications of the way an acquisition capability may develop.

More studies will be necessary in order to test our hypotheses in different contexts and to achieve a more fine-grained appreciation of the conditions under which distinct integration strategies work and how integration capabilities develop. We believe that the results of the analyses presented above can guide future scholars in promising directions toward increasing understanding of the antecedents of merger performance. This work also has implications, more broadly, for the creation and evolution of organizational capabilities. Further research on the processes used by firms to develop capabilities in other contexts, such as restructuring process, strategic alliances and new product development, will strengthen our understanding of these important phenomena. In addition, such research will provide additional settings in which to apply, validate and extend the knowledge and capability based view of the firm.

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