

THE LONG-TERM PERFORMANCE OF HORIZONTAL ACQUISITIONS

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ABSTRACT

This paper examines how value is created in horizontal mergers and acquisitions. More specifically, it examines the impact of post-acquisition asset divestiture and resource redeployment on the long-term performance of horizontal acquisitions. The data come from a detailed survey of acquiring firm managers and cover 253 horizontal mergers and acquisitions that were initiated by European and U.S. firms in manufacturing industries for the period 1988-1992. This study incorporates insights from the cost efficiency and resource-based theories to propose a model of the effects of asset divestiture and resource redeployment on long-term acquisition performance. Overall, our results show that both asset divestiture and resource redeployment can contribute to acquisition performance, with, however, a significant risk of damaging acquisition performance when the divested assets and redeployed resources are those of the target.

(Keywords: Mergers and Acquisitions; Value Creation; Synergy; Resource-Based View)

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INTRODUCTION

Within the context of globalization, deregulation, intensification of competitiveness, relaxation of anti-trust legislation, and European Union integration, horizontal mergers and acquisitions have become the dominant mode of firm growth in the eighties and nineties for both European and U.S. firms. Whereas these acquisitions have played an important role in firm strategy, their contribution to firm performance still remains a controversial issue (Seth, 1990a). From the vast body of literature on the subject of acquisition performance, an array of hypothesized sources of gains has emerged (Steiner, 1975; Jensen and Ruback; 1983; Seth, 1990a). In the strategy literature, horizontal acquisitions are explained by two main classes of theories: (1) “value-maximizing theories” and (2) “managerial theories” (Seth, 1990a). This paper focuses on the first perspective, which is rooted in the traditional cost efficiency theory based on the notion of economies of scale and scope, and in the resource-based view based on enhanced utilization of core competencies and resources (Rumelt, 1974; Barney, 1988; Prahalad and Hamel, 1990).

Previous large-sample studies in the acquisition strategy literature examine the motives for acquisitions and investigate the pre-acquisition and post-acquisition performance of the target and acquiring firms (e.g., Seth 1990b; Singh and Montgomery, 1987; Lubatkin, 1987). While these studies suggest that merging firms capture synergies through asset divestiture and resource redeployment, there continue to be many unresolved issues. This study complements the extant acquisition literature by providing a fine-grained analysis of the nature of post-acquisition actions in terms of asset divestiture and resource redeployment, and their impact on the long-term performance of acquisitions.

The conceptual framework of this paper first draws on the cost efficiency argument to explore the effects of targets’ and acquirers’ post-acquisition asset divestiture on cost savings. Next, drawing on the resource-based view of the firm, we investigate the effects of post-acquisition resource redeployment from acquirers to targets, and *vice versa*, on revenue-

enhancing capabilities. We then turn to a discussion of the dynamic interplay between asset divestiture and resource redeployment. Lastly, we investigate whether the direction of post-acquisition actions influences their effectiveness.

In this study, we use the term “acquisition” to refer to the acquisition by one corporation of another entire corporation or of a business from an ongoing corporation. We use the term “horizontal acquisition” to describe the acquisition of a business within the same industry. The term “asset divestiture” refers to the extent to which merging firms dispose of their physical assets and cut back their personnel in different areas, including R&D, manufacturing, logistics, sales networks, and administrative services. “Resource redeployment” is the extent to which a target or acquiring firm uses the other firm’s resources (R&D capabilities, manufacturing know-how, marketing resources, supplier relationships, and distribution expertise), which may involve physical transfer of resources to new locations or sharing resources without physical transfer.

The data come from a detailed survey of acquiring firm managers and cover 253 horizontal mergers and acquisitions that took place in American and European manufacturing industries from 1988 through 1992. We use structural equations to estimate the hypothesized relationships. In summary, five results stand out from this research : (1) the divestiture of the acquirer’s assets, although very rare, has a positive impact on cost savings; (2) the divestiture of the target’s assets (which is three to five times more likely to occur than the divestiture of the acquirer’s assets) does not reduce costs and damages capabilities; (3) resource redeployment from acquirers to targets not only improves revenue-enhancing capabilities (market coverage and innovation capability), but also reduces costs; (4) resource redeployment from targets to acquirers also improves revenue-enhancing capabilities, but in some cases can hurt acquisition performance; (5) asset divestiture and resource redeployment commonly intertwine. Overall, these results show that both asset divestiture and resource redeployment contribute to acquisition performance; however, there is a significant risk of damaging acquisition performance in the process of divesting and redeploying the target’s assets and resources.

In the next section, we introduce the theoretical background for the study and the hypotheses. We then present the research design. In the third section, we provide the empirical

results of the measurement and structural models. We then discuss the results. Finally, we conclude by discussing the implications and limitations of our findings.

BACKGROUND AND PROPOSITIONS

Horizontal acquisitions create value by exploiting cost-based and revenue-based synergies. Synergy exists in an acquisition when the value of the newly-combined firm exceeds the sum of the values of the two merging firms, when acting independently. On the one hand, cost efficiency theories emphasize the role of cost-based synergies that arise when the divestiture of the assets of the merging firms leads to cost savings. On the other hand, the resource-based view of the firm emphasizes the role of revenue-enhancement synergies arising when the redeployment of the resources of the merged firms leads to revenue-enhancing capabilities. In the study of horizontal acquisitions, cost-based synergies have generally received more attention than revenue-based synergies, as horizontal acquisitions have typically been seen as a straightforward mechanism for reducing costs through asset divestiture. In addition, cost-based synergies and revenue-based synergies have often been seen as two fundamentally different, and to some degree mutually exclusive, logics. In this section, however, we aim to provide a more complete picture of how value is created through horizontal acquisitions by investigating the joint effects of cost-based and revenue-based synergies on acquisition performance. We specifically examine how these synergies can be achieved through asset divestiture and resource redeployment.

Post-acquisition asset divestiture and cost-based synergies

Economics literature has traditionally seen horizontal acquisitions as an opportunity to achieve cost savings through the exploitation of economies of scale and scope. Several studies show that asset divestiture, i.e. the elimination of redundant activities and inefficient management practices, improves the performance of horizontal acquisitions (Anand and Singh, 1997; Tremblay and Tremblay, 1988). Economies of scale and scope are especially useful to predict the performance of horizontal acquisitions, since they are more likely to exist with overlapping businesses than with unrelated acquisitions (O'Shaughnessy and Flanagan, 1998).

Economies of scale arise if the merged firm achieves unit cost savings as it increases the scale of a given activity. Production-linked economies of scale are commonly considered as the main driver of cost cutting, but economies of scale may also be achieved in other functional areas

of a business (e.g., R&D, distribution, sales or administrative activities) through the spreading of fixed costs over a higher total volume (Shepherd, 1979). In addition, sharing activities can also enable merging firms to obtain cost reduction based on learning curve economies, since each merging business, when acting independently, might not have a sufficiently high level of cumulative volume of production to exploit learning curve economies.

Economies of scope arise when the merged firm achieves cost savings as it increases the variety of the activities it performs. This is the case when the shared factor of production is imperfectly divisible, so that the manufacture of a subset of goods leaves excess capacity in some stages of production (Panzar and Willig, 1981; Teece, 1982). Horizontal acquisitions commonly increase the scope of the firm and allow spreading the firm's resources over a broader range of products (Lubatkin et al., 1998). Horizontal acquisitions provide opportunities for sharing assets characterized by some indivisibility and under-utilized before the acquisition, while rationalizing two sets of product lines and divesting the less efficient assets.

The exploitation of economies of scale and scope through acquisition is usually achieved through asset divestiture¹. In principle, this divestiture could take place without the use of an acquisition if the market were efficient enough to discipline firms into specializing their assets in a given (or across) activity(ies) according to their respective efficiency, and to stimulate efficient plant investment, specialization or closure choices (Scherer and Ross, 1990). However, transaction costs prevent firms from using market contracting to rationalize their assets, and asset divestiture through market mechanisms can generate situations of mutual specialization and co-dependency between the contracting partners (Teece, 1982; Dranove and Shanley, 1995).

In summary, horizontal acquisitions can create value by exploiting cost-based synergies achieved through asset divestiture. Both targets and acquirers can be the objects of divestiture measures. Accordingly, we propose:

Proposition 1. Following a horizontal acquisition, the divestiture of:

. The acquirer's assets (H1a)

. The target's assets (H1b)

improves the long-term performance of the merging firms through cost savings.

Post-acquisition resource redeployment and revenue-based synergies

Beyond gains from cost cutting, acquisition performance is also influenced by the ability to enhance revenues by accessing complementary resources. The economic logic of capturing revenue-based synergies is often known as sharing complementary resources (or leveraging core competencies, or mobilizing invisible assets). It takes its theoretical roots in the resource-based view of the firm (Penrose, 1959). We consider two ways of enhancing revenues: increased market coverage and enhanced innovation capability.

Horizontal acquisitions can increase market coverage through the geographic extension of the market and through product line extension (Aaker 1996; Srivastava et al., 1998). Greater market coverage allows the merged firm to sell existing products (once confined to the particular markets of one firm) to a wider body of consumers, thus enhancing revenues. Shared product lines enable the merging firms to increase the variety of product lines, and eventually to cross-sell and bundle products to customers. The value of these bundles to customer may be greater than the value of each product separately. Product line extension can also enhance revenues if the merged firm manages to exploit the strong reputation of a merging business brand, sales network or marketing activities (Capron and Hulland, 1999). For example, the redeployment of brands with strong consumer equities can help change consumers' perceptions of existing products, differentiating them from competitive offerings (Amit and Schoemaker 1993; Keller, 1993; Shocker, Srivastava, and Ruekert, 1994). Overall, superior marketing capabilities can lead to customer value, which in turn can be translated into premium prices and/or increased volumes (Barney, 1991; Srivastava et al., 1998).

Innovations are an alternative source of customer value. Horizontal acquisitions can enhance innovation capability by using the superior innovation capability (proprietary technology, patents, know-how) of one of the merged firms to enhance product features (product innovation capability) or to improve organizational and marketing effectiveness (e.g., time to market, customer satisfaction). Innovation capability can be converted into price premium and/or increased volume, leading to higher revenues.

The exploitation of revenue-based synergies (increased market coverage and innovation capability) through acquisition is usually achieved through resource redeployment. Such resource redeployment, i.e. the use by a target or acquiring business of the other business' resources, could take place without the use of an acquisition if the market for resources was efficient enough to allow firms to exchange their resources. The market failure argument plays a central role in explaining why firms redeploy resources through acquisitions. It takes its intellectual roots in transaction cost economics and holds that several imperfections may exist in markets for intangible resources, including immobility, information asymmetries and associated moral hazards, causal ambiguity, and monopoly (Williamson, 1975). These market imperfections create complications in the pricing and transfer of resources and consequently increase the associated risks of undertaking arm's length contracts with independent partners (Buckley and Casson, 1976; Teece, 1982; Hennart, 1982; Chi, 1994).

In parallel with transaction cost logic, evolutionary arguments view acquisitions as part of a knowledge-based process, in which acquirers learn how to use their existing intangible resources in the target's market, or acquire unfamiliar new resources from the target (Haspeslagh and Jemison, 1991; Kogut and Chang, 1991; Kogut and Zander, 1992; Zollo, 1998). Defining the firm as a repository of social knowledge, the evolutionary perspective argues that resource replication in new settings requires the receiving unit to have a significant degree of exposure to and absorption of information during the redeployment process, and the transferring unit to initiate a lengthy process of teaching and providing the supporting skills to the receiving unit (Szulanski, 1996; Nelson and Winter, 1982; Pisano, 1988). The evolutionary perspective suggests that acquisitions help the acquirer achieve ongoing interaction in using resources through post-acquisition collaboration mechanisms such as cross-posting of staff, formation of corporate task forces, and joint management of shared functions (Kogut and Zander, 1992; Singh and Zollo, 1998; Barkema, Bell, and Pennings, 1996).

In summary, for reasons either of control or knowledge, acquisitions are a vehicle for selling or acquiring bundles of resources in highly imperfect resource markets (Mahoney and Pandian, 1992; Mitchell, 1994; Capron, Dussauge and Mitchell, 1998; Wernerfelt, 1984). Acquisitions enhance performance by allowing businesses to obtain preferential access to resources that cannot be purchased in a competitive market (Barney, 1986; Dierickx and Cool,

1989, Peteraf, 1993). As a result, acquisitions can create value and enhance revenues by redeploying resources from the acquirer to the target, and *vice-versa*, from the target to the acquirer. Accordingly, we propose:

Proposition 2. Following a horizontal acquisition, the redeployment of:

. The acquirer's resources to the target (H2a)

. The target's resources to the acquirer (H2b)

improves the long-term performance of the merging firms through improved revenue-enhancing capabilities.

Exploration of potential cross-effects

The most recent work on acquisition or corporate transformation tends to see asset divestiture and resource redeployment as parts of a common process of reconfiguration of the target and acquirer businesses (Burgelman, 1994; Galunic and Rodan, 1998). Asset divestiture commonly implies changes in organizational, technological or marketing resources to produce and sell greater volumes of goods more efficiently. At the same time, the process of redeploying resources tends to create redundancies and conflicts with existing resources. The firm then tends to sell excess physical assets, shut excess facilities, and lay off surplus employees. As a result, we correlate asset divestiture and resource redeployment in our model.

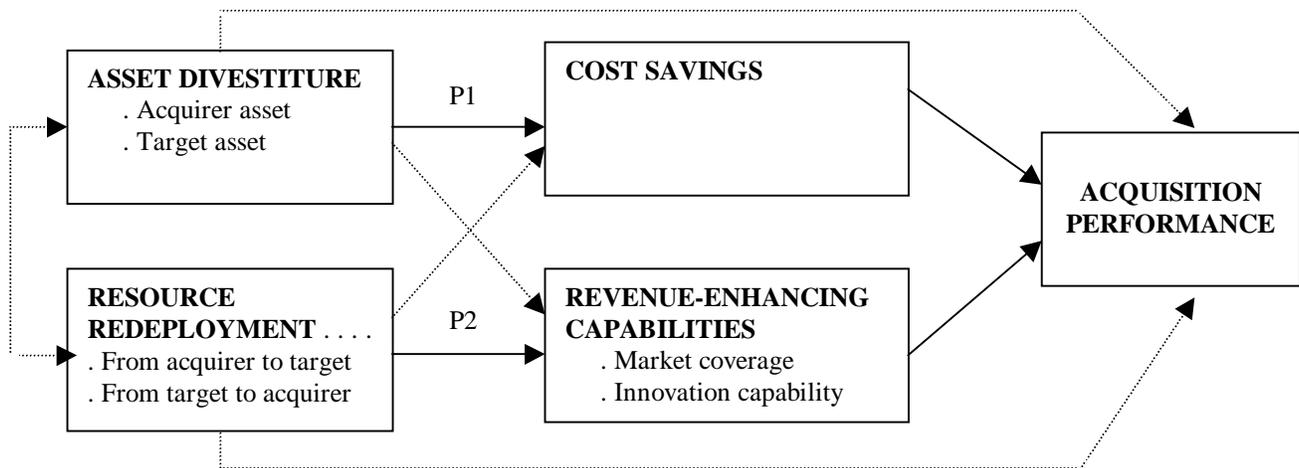
In the same vein, we explore the potential cross-effects of asset divestiture on revenue-enhancing capabilities and of resource redeployment on cost savings. The question of whether asset divestiture stimulates or hinders market development and innovation remains controversial (McKinley, 1993). Jensen (1986) claims that downsizing cuts out excessive resources and therefore allows resources to be allocated more productively. Others, however, have claimed that downsizing conflicts with innovation and market development. Asset divestiture risks damaging capabilities as the firm reduces its organizational slack and its propensity to innovate and develop new markets (Hamel and Prahalad, 1994; Kanter, 1989). Downsizing can also violate employee trust (Shleifer and Summers, 1988), inhibit risk taking (Staw et al., 1981), break the network of informal relationships used by innovators, and lead to reduced innovation (Dougherty and Bowman, 1995; Cameron et al., 1987).

Similarly, the question of whether resource redeployment hurts or saves costs is controversial. On the one hand, resource redeployment can hurt costs as the merging firms need additional resources to implement resource redeployment. Maintaining slack resources may be necessary to increase the “learning” capacity of the recipient firm and to increase the transferring firm’s “teaching” effectiveness. On the other hand, some authors have suggested that resource redeployment can improve cost efficiency in horizontal acquisitions (Teece, 1982; Panzar and Willig, 1981; Scherer, 1980). For example, acquisitions can provide access to certain factors of production--such as a proprietary process technology--which can be used to increase production efficiency or reduce production or supply costs. Such cost savings arise from resource redeployment and are a “dynamic” source of efficiency, in contrast with the more static economies of scale.

Finally, we explore the potential remaining direct effects between asset divestiture and resource redeployment on acquisition performance, effects not captured by the mediating value-creating variables, cost savings and revenue-enhancing capabilities. Figure 1 summarizes our model of horizontal acquisition performance.

**** Insert Figure 1 about here ****

Figure 1. Theoretical model



Asymmetries between target and acquiring firms

The preceding discussion does not distinguish between the divestiture of the assets of the target or of the acquirer, nor between the redeployment of resources to the target or to the acquirer. However, there is some evidence showing that the direction of post-acquisition actions influences their effectiveness.

The theoretical model we have built relies on underlying behavioral assumptions regarding the processes by which post-acquisition decisions are made. This model assumes that post-acquisition asset divestiture and resource redeployment are motivated and implemented to maximize the combined efficiency and effectiveness of the merging firms. This view implies that post-acquisition decisions are made following a rational process, given the respective position of the merging firms in terms of asset efficiency and resource complementarity. Finally, it also implies that this process is one of joint decision-making by acquirer and target managers.

These assumptions have been questioned in the post-acquisition integration literature (Pablo, 1994; Haspeslagh and Jemison, 1991; Jemison and Sitkin, 1986;). Many studies show that a parallel political process can impair post-acquisition decisions, and that the acquiring firm tends to dominate this process. The changes associated with post-acquisition consolidation processes occur primarily within the target firm (Datta, 1991; Shanley and Correa, 1992; Hambrick and Cannella, 1993; Pablo, 1994).

For economic and behavioral reasons, the target is very likely to bear the burden of post-acquisition asset divestiture. Acquisitions by a related acquirer are very likely to lead to acquiring firms' managers recognizing and reducing inefficiencies in the target due to their experience managing similar lines of businesses (Hambrick and Cannella, 1993; Walsh, 1988). Managers of the acquiring firm will often be confident in their own managerial capabilities and be much more willing to undertake management of the target than to use the target's managerial capabilities (Walsh, 1988). Therefore, managers from the acquiring firm will often colonize the target by providing it with their own management tools and controlling the implementation of these tools (Hambrick and Cannella, 1993; Buono and Bowditch, 1989; Chatterjee, Lubatkin, Schweiger and Weber, 1992). Moreover, it is politically easier for the acquirer to impose divestiture measures on the target rather than on its own businesses. Rationalizing the target allows the acquirer to keep

and devote its excess assets and staff to new uses. Altogether, the likely target asset divestiture, and the colonization of the target by the acquirer, nurture a feeling of diminished relative status of target managers and create high target executive turnover after an acquisition (Mirvis and Marks, 1992; Walsh, 1988). As a result, organizational disruption is very likely to occur in the process of divesting the target's assets. Accordingly, we propose:

Proposition 3. Following a horizontal acquisition, the divestiture of the target's assets has a lower impact on cost savings than the divestiture of the acquirer's assets.

A similar behavioral rationale also applies to redeployment of resources, because the acquirer sometimes prefers to invest its idle resources in the target and eliminate the target's resources. In the process of selling off the target's resources, acquirers may make choices that destroy the competencies of the target firm and make the target less likely to provide valuable resources to the acquirer. In sum, acquiring firms are more likely to damage the assets and resources of target firms than their own assets and resources (Ravenscraft and Scherer, 1987). Moreover, the organizational disruption that the target is likely to face following an acquisition may jeopardize the viability of resource redeployment between the merging firms, above all from the target to the acquirer if the capabilities of the target have not been preserved and key people embodying this knowledge retained (Ranft and Lord, 1998; Hambrick and Canella, 1993). Accordingly, we propose:

Proposition 4: Following a horizontal acquisition, the redeployment of the target's resources to the acquirer has a lower impact on revenue-enhancing capabilities than the redeployment of the acquirer's resources to the target.

As noted previously, we also explore the potential cross-effects. If cross-effects exist, we would expect the divestiture of the target's assets to be more damaging for revenue-enhancing capabilities than the divestiture of the acquirer's assets. Similarly, we would expect the resource redeployment from the target to the acquirer to be less likely to save costs than the resource redeployment from the acquirer to the target.

RESEARCH DESIGN

Since traditionally available financial data is too gross to permit differentiation between the types of fine-grained value-creating mechanisms that our model considers, we use a survey to collect detailed primary data pertaining to post-acquisition behavior on a large-scale basis. Survey data have been used extensively in strategy literature to gather information on post-acquisition processes and performance (Very, Lubatkin, Calori and Veiga, 1997; Datta, 1991; Hunt, 1990; Shelton, 1988).

Sample and data selection

Sampling frame

The initial sample consisted of 2,020 acquisitions that took place during the 1988-1992 period between manufacturing companies operating within the same industry, defined at the four-digit level of the U.S. Standard Industrial Classification (SIC). The 1988-1992 period was chosen to exclude recent acquisitions in which post-acquisition decisions had not yet led to asset divestiture or resource redeployment at the time of the survey, as well as older acquisitions for which managerial turnover made it difficult to gather detailed information about post-acquisition activities. Sources for information include the *International Merger Yearbook* (1990, 1991, 1992), *Merger and Acquisitions Sourcebook* (1990, 1991, 1992), *Mergers and Acquisitions Europe* (1990, 1991, 1992), and *Fusions et Acquisitions Magazine* (1989, 1990, 1991, 1992).

Procedure

The data collection process proceeded in four phases. First, measurement scales were developed by reviewing relevant literature, by completing 25 on-site interviews with CEOs from large firms, academics and consultants and by pre-testing the resulting scales with a group of academics and consultants. Next, a single bilingual researcher pre-tested the preliminary versions of the resulting questionnaires (in both English and French) with senior executives of large U.S. and European firms attending executive training programs in two major business schools located in the United States and in France. These pre-tests led to the revision of several items to improve their clarity as well as the addition of several new items identified during the interviews. The third stage consisted of on-site interviews with CEOs or executives in charge of their acquisition programs in 10 large firms, resulting in the final versions of the questionnaire. In the final stage,

the survey was mailed to the acquiring companies included in the sampling frame described above. We addressed the surveys to the chief executives of the business units that undertook the acquisition. The cover letter requested that the survey be completed either by the CEO or by a senior executive with overall responsibility for the acquisition case studied. Following Dillman (1978), two follow-up letters and one replacement questionnaire were mailed after the initial mailing.

A single informant was used for each acquisition. Although the use of multiple respondents would have reduced concerns about potential response biases, respondents had to be knowledgeable about the firm and its competitive environment (Campbell, 1955), as well as the consolidation processes following the acquisition. In a large sample study, identifying and obtaining responses from multiple well-informed respondents is extremely problematic. The key methodological solution in using a single respondent approach is to find the most appropriate respondent (John and Reves, 1982). Thus, we qualified our respondents as individuals who held a CEO or equivalent position, or had been involved as senior managers of the acquisition process.

Finally, we recognize that the survey records only the acquirers' views of the acquisition. However, the managers from the acquiring firms tend to be the most knowledgeable about post-acquisition activities, owing to the high level of target CEO turnover following acquisitions (Walsh, 1988). From a practical standpoint, it is often next to impossible to track former executives of the target firm, since in many cases the target is no longer a separate entity.

Achieved sample

From the initial sample, questionnaires were mailed to the 1,778 acquirers for whom we obtained addresses. A total of 273 completed questionnaires were returned, representing a response rate of 15 %. This response rate is comparable with the ones found in the most recent large-scale surveys involving executives (Gatignon, Robertson and Fein, 1997; Powell and Dent-Micalleff, 1997; Robertson, et al.; 1995). This response rate is reasonable given the setting of the survey (in more than a dozen countries on two continents), firm diversity, the positions of the respondents (CEO, president, executive chair, vice president of finance, and managing director), and the sensitivity of the information. Following a check to ensure that these cases all represented horizontal acquisitions, 20 responses were eliminated. The final data set includes 253 unique

targets and 190 unique acquirers, with a smaller number of acquirers occurring because some firms acquired more than one target (and thus returned several questionnaires to analyze the different acquisition cases involved, answering one questionnaire for each case).

We evaluated non-response biases by comparing the industries represented in our sample with the initial sample used. We found no differences in the industries represented. We also compared early respondents (first half) with late respondents (second half), following the Armstrong and Overton procedure (1977). We found no significant differences on key characteristics such as market conditions, acquisition motives or industry characteristics, suggesting that non-response bias might not be a problem. Overall, the dataset represents a wide range of industries, countries (for targets, and to a lesser extent for acquirers²), firms, and scope of acquisition, as shown in Table 1. Moreover, in order to account for potential biases, the statistical analyses controls for some sources of heterogeneity in the sample, as discussed below.

***** Insert Table 1 about here *****

Control for sources of sample heterogeneity

Horizontal scope

While the focus of the study is on horizontal acquisitions (defined as acquisitions between firms belonging to the same industry), there may still be various degrees of relatedness within this category of acquisitions. SIC measures, even at a four-digit level of specificity, are likely to suffer from aggregation biases. Two firms from the same SIC category can be direct rivals with very similar products and markets (and be qualified as horizontal in the purest sense), or also be qualified as “product or market concentric” (or “related”, or Type 3 and 4 acquisitions, using the former FTC acquisition classification). It seems likely that different degrees of relatedness have different impacts on value creation. For example, we might expect that the greater the relatedness between the merging firms’ activities, the greater the opportunities to achieve cost savings through divestiture of redundant assets. We might also expect that similarity of merging firms eases resource redeployment and capability building. At the same time, similarity may reduce the opportunities for leveraging complementary resources.

Geographic scope

Many horizontal acquisitions span international boundaries. There is a significant body of literature (commonly known as internalization theory) that argues that cross-border acquisitions are primarily driven by the willingness of the acquirer to redeploy its excess resources and to use the targets' location-specific resources which are necessary to make the redeployment of other resources viable (Buckley and Casson, 1976; Caves, 1982; Hennart, 1982; Morck and Yeung, 1992). More recently, cross-border acquisitions have been shown to be a means for the acquirer to tap foreign target firms' resources (Eun, Kolodny, and Scheraga, 1996). At the same time, however, we might expect that distance, control, and language barriers would impair value creation in cross-border acquisitions.

Relative size of the merging firms

There is substantial evidence showing that the potential to create value from an acquisition depends upon the relative size of the merging firms. For example, if the targets are relatively small compared to their acquirers, actions to restructure the target may simply be unnecessary or of limited input to value creation. Seth (1990b) argues that similar relative size of acquirers and targets favors the exploitation of operational synergies.

Diversified acquirer

Last, we controlled for the diversification of the acquirer. We could argue that the diversity of a firm's products favors redeployment of resources across various business settings.

Measures

Questions from the original survey that are relevant here are presented in the Appendix. The means, standard deviations, and correlations among the variables are shown in Table 2.

Endogenous variables

The survey provided the information needed to measure the independent variables. While self-report measures carry some methodological limitations (respondent bias, performance overestimation; for a discussion see Dillman, 1978; Rossi, Wright and Anderson, 1983), we used perceptual measures in this study because of the difficulties associated with the use of "objective" measures in assessing post-acquisition performance (Kitching, 1967; Porter, 1987). First, event studies capture the capital market's prediction of the magnitude, nature and viability of

consolidation processes. In the context of this research, we study the long-term effect of acquisitions on performance. Second, accounting measures are typically available in aggregate form, and isolating the performance of the acquisition after controlling for the performance of other units and the impact of exogenous events is difficult. A reasonable alternative is the use of managerial judgement, which provides the unique opportunity to gather information on the multiple facets of acquisition performance and to isolate the impact of an acquisition *per se* on performance from other exogenous variables (Datta, 1991).

Acquisition performance. Consistent with the literature (Hunt, 1990; Datta; 1991), the long-term performance of an acquisition is measured by self-reported measures of changes in market shares, sales, intrinsic profitability, and relative profitability compared to industry average since the acquisition. These indicators are reflective in nature, which is consistent with arguments developed in previous studies (Fornell et al., 1990). These indicators, based on a five-point scale, are measured from a consolidated standpoint (with one indicating significant decline, and five significant increase), and from a separate standpoint for the target and the acquirer, respectively. The retained measure of acquisition performance used the average of these three values.³

Cost-based synergies. Cost reduction was operationalized by asking the respondents for their assessment of the extent to which the acquisition had a positive impact on product costs and input prices. These indicators, based on a five-point scale (with one for negative impact, and five for positive impact), are reflective.

Revenue-based synergies. We captured revenue enhancement potential through two constructs, market coverage and innovation capability. Market coverage was operationalized through two indicators: extension of product lines and broadening of geographical coverage. Innovation capability was captured through two indicators: improvement of product innovation capabilities and improvement of development design cycle (time to market). These items are reflective and based on a five-point scale (with one for negative impact, and five for positive impact).

Exogenous variables

Asset divestiture. The extent of post-acquisition asset divestiture was measured using an adapted version of the scale developed by Datta (1991). The extent to which the acquiring and

acquired firms, respectively, divested their assets was measured across five main functions: R&D, manufacturing, logistics, sales network, and administrative services. The degree of divestiture for each function was assessed by taking the mean value of two questions concerning, respectively, the degree of capacity disposed of (closed or resold) and the proportion of the workforce cut – measured on a seven-point scale (1 = 0% of assets divested over total assets; 7 = 91-100 % of assets divested over total assets). Each indicator associated with the divestiture of a specific function was reflective of a part of the firm divestiture process. Preliminary factor analyses showed that the items related to R&D divestiture loaded on a separate construct, suggesting that divestiture of the R&D function occurs independently of the measures of divestiture taken in the other functions, such as manufacturing, distribution, and administration. In order to keep the model parsimonious, we did not add a new construct and dropped the items pertaining to R&D divestiture.

Resource redeployment. Based on previous discussions (Hofer and Schendel, 1978; Barney; 1986; Morck and Yeung, 1992; Amit and Schoemaker, 1993; Teece, Pisano and Shuen, 1997), resource redeployment to targets and to acquirers is captured through five types of intangible resources: R&D capabilities, manufacturing know-how, marketing resources, supplier relationships and distribution expertise. Each indicator measures the magnitude of resource redeployment following the acquisition, with a range from 1 to 5 (1= not transferred at all; 5= transferred to a very large extent). These indicators are reflective.

Control variables

Horizontal scope. We used two measures for relatedness. The first measure was the assessment by the respondents of the similarity of products and technologies between the target and the acquirer (“internal relatedness”) – on a five-point scale, with one being not similar and five very similar. We took the means of the value corresponding to these two questions (see Appendix). The second measure was the assessment by the respondents of the similarity of customers, geographic markets, and the degree of direct competition between the target and the acquirer (“external relatedness”). We used the average value on these three questions.

Geographic scope. We used a binary variable to account for domestic versus cross-border acquisitions.

Relative size of the merging firms. We used a five-point scale to account for the relative annual sales of target to acquirer (with one indicating a relative size of the target to the acquirer of less than 25% , and five superior to 100%).

Diversified acquirer. We measured the degree of the acquirer’s diversification with a three-point scale (with one equivalent to a conglomerate acquirer, two to related multi-business acquirer, and three to a focused acquirer).

***** Insert Table 2 about here *****

Model structure

We chose a structural modeling approach and estimated the model using AMOS 3.6 (Arbuckle, 1997). AMOS belongs to the second generation of the multivariate analysis family of techniques, which also includes LISREL. Structural modeling addresses structural and measurement issues frequent in survey-designed research and has been used increasingly in strategic management research (Hopkins and Hopkins, 1997; Birkinshaw, Morrison and Hulland, 1995; Fornell, Lorange and Roos, 1990)⁴.

A model for AMOS estimation consists of two primary parts: (1) an inner structural model that captures the structural relationship between the endogenous and exogenous latent variables, and (2) an outer measurement model that captures the manifestation of constructs or latent variables in terms of observable measures.

The inner structural model specifies the relations among the constructs (or latent variables) and can be written as:

$$\eta = \beta\eta + \Gamma\xi + \zeta$$

where η is a $(m \times 1)$ vector of latent endogenous variables, ξ is a $(n \times 1)$ vector of exogenous latent variables, β is a $(m \times m)$ matrix of endogenous variable coefficients, Γ is a $(m \times n)$ matrix of exogenous variable coefficients, and ζ is a $(m \times 1)$ vector of residuals. The latent endogenous variables (η) in this model are the mediating variables (cost reduction, market coverage, and innovation capability), and acquisition performance. The latent exogenous variables (ξ) are the post-acquisition actions (asset divestiture and resource redeployment). Lastly, we

specify the variance-covariance matrix of latent exogenous variables (ϕ) to allow the ξ to be correlated.

In turn, the outer measurement model can be written as:

$$y = \Lambda_y \eta + \varepsilon$$

$$x = \Lambda_x \xi + \delta$$

where y is a ($p \times 1$) vector of endogenous indicators, x is a ($q \times 1$) vector of exogenous indicators, Λ_y is a ($p \times m$) matrix of regression coefficients of η on y , Λ_x is a ($q \times n$) matrix of regression coefficients of ξ on x , ε is a ($p \times 1$) vector of measurement error for the indicators of endogenous variables, and δ is a ($q \times 1$) vector of measurement error for the indicators of exogenous variables.

In order to provide a metric, one indicator of each latent construct was specified as having a factor loading equal to one (Bollen, 1989). AMOS estimated the structural and measurement models using the Full Information Maximum Likelihood estimator, which is recognized as an efficient estimator in the presence of missing data (Arbuckle, 1997).

RESULTS

In this section, we report and comment on the descriptive data regarding the extent and direction of post-acquisition asset divestiture and resource redeployment. We then estimate our model with its full specifications, as expressed in Figure 1. The analysis and interpretation of a structural equation model with latent variables take place in two stages: (1) assessment of the reliability and validity of the measurement model and (2) assessment of the causal relationships within the structural model.

Descriptive results

Divestiture of targets' and acquirers' assets

Table 3 reports the extent of asset divestiture within the five functions of the business: R&D, manufacturing, distribution, sales networks, and administrative services. We defined two thresholds, corresponding, on the one hand, to more than 10% of the assets or staff affected by the divestiture and, on the other hand, to more than 30% of the assets or staff. The results show

that the magnitude of the post-acquisition divestiture varies significantly across functions. The manufacturing, logistics and administrative functions are the most affected by the post-acquisition asset divestiture. In fact, in these functions, one could easily undertake divestiture measures with a lower risk of damaging the innovative capabilities of the firm, its commercial presence, or its image on the market.

It is clear from the results of the survey that post-acquisition divestiture affects the acquiring and target firms in an asymmetric manner: the target's assets are commonly three to five times more likely to be divested than the acquirer's assets. These results are consistent with the literature that shows that divestiture measures are most likely to be imposed on the target.

***** Insert Table 3 about here *****

Resource redeployment to and from target

Tables 4a and 4b report the extent of redeployment within the five resource categories: R&D, manufacturing, marketing, supplier relationships and distribution. Table 4a reports the extent to which the acquirer redeploys its resources to the target. As expected, acquirers frequently redeployed their resources to targets. Resource redeployment from acquirers to targets "to a large extent" or greater occurs in 44% (R&D), 51% (manufacturing), 48% (marketing), 48% (supplier relationship), and 33% (distribution expertise) of the cases. By contrast, redeployment "to a large extent" or greater was much less common for resource redeployment from targets to acquirers. Table 4b shows that target firms redeployed resources to acquirers at least "to a large extent" in 24% (product innovation), 24% (manufacturing), 20% (marketing), 20% (supplier relationship) and 14% (distribution expertise) of the cases.

The correlation matrix in Table 2 shows that firms frequently redeploy some types of resources together. Firms often redeploy R&D and manufacturing resources jointly ($r = 0.60$ for redeployment to target, $r = 0.66$ for redeployment to acquirer), which supports the argument that R&D and manufacturing resources often intertwine. Similarly, firms often redeploy marketing expertise together with R&D ($r = 0.52$ for redeployment to target, $r = 0.41$ for redeployment to acquirer), manufacturing ($r = 0.47$ for redeployment to target, $r = 0.41$ for redeployment to

acquirer), or supplier relationship ($r = 0.45$ for redeployment to target, $r = 0.45$ for redeployment to acquirer) resources.

***** Tables 4a and 4b about here *****

Measurement model results

Consistent with the two-step approach advocated by Anderson and Gerbing (1988), we estimated a measurement model prior to examining structural model relationships. We modeled the eight constructs as eight correlated first-order factors.⁵ We tested the measurement model by examining individual item reliability, internal consistency, and discriminant validity. The results are reported in Table 5.

All the non-fixed indicator loadings for each construct are significant ($p < 0.01$), and range from 0.68 to 0.94. A common rule of thumb is to accept items with more explanatory power than error variance (Carmines & Zeller, 1979). In practice, this implies accepting loading greater than 0.7. This criterion is met for all items but two, which are at 0.68

Evidence of internal consistency is provided by a measure suggested by Fornell and Larcker (1981), which is deemed acceptable if it is higher than 0.70.⁶ As reported in Table 3, all scales demonstrate adequate internal consistency. Also included in Table 5 are the average variance extracted estimates⁷, which assess the average amount of variance in the indicators explained by the latent variable (relative to their average measurement error), and the correlations (ϕ estimates) among the latent constructs in the model. All estimates are higher than the 0.50 threshold recommended by Fornell and Larcker to demonstrate convergent validity.

Lastly, in order to assess discriminant validity, we verified that each construct shares more variance with its measures than it shares with other constructs. Discriminant validity is supported when the correlation between two constructs (ϕ estimates) is less than the square root of the average variance extracted of the two constructs (Fornell and Larcker, 1981). This criterion is met across all possible pairs of constructs. Table 5 shows the correlation matrix for the constructs. The diagonal of this matrix reports the square root of the Average Variance Extracted. Our constructs exhibit adequate discriminant validity since the diagonal elements are significantly greater than the off-diagonal elements in the corresponding rows and columns.

***** Insert Table 5 about here *****

Structural model results

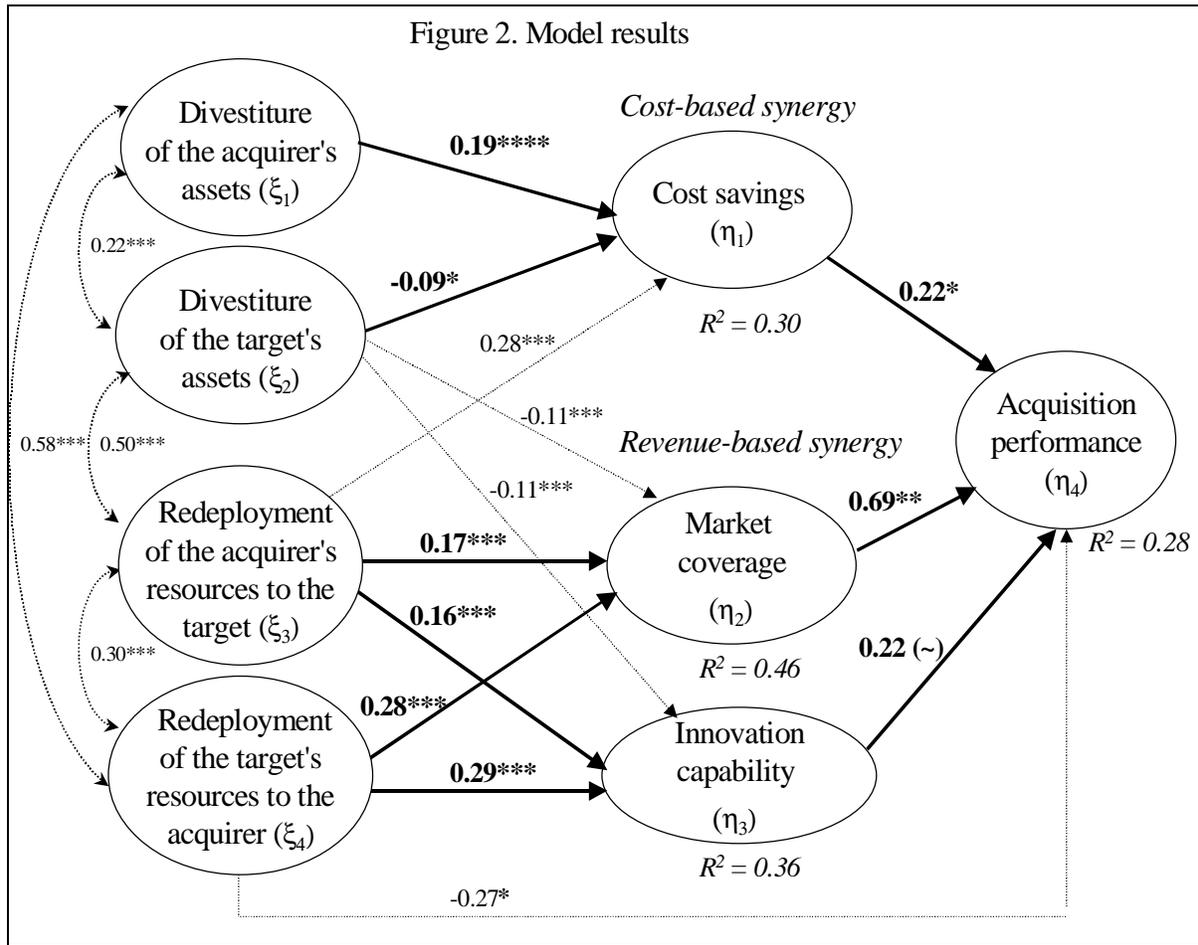
Overall acquisition performance variance

Figure 2 reports the results for the structural model depicted in Figure 1. Only the significant relationships are reported. Figure 2 indicates that the variance in long-term acquisition performance explained by the model is 28%, which is reasonable given that a large number of factors can have an impact on acquisition performance. The three mediating variables--cost savings, market coverage and innovation capability--have a positive and significant impact on acquisition performance, with market coverage having the most significant impact ($\beta_{42} = 0.69$, $p < 0.05$). Cost savings has a lower, but still significant, impact on acquisition performance ($\beta_{41} = 0.22$, $p < 0.10$). Innovation capability has a positive, but marginally significant, impact on acquisition performance ($\beta_{43} = 0.22$, $p \cong 0.10$).

Some preliminary lessons can be drawn from these results. First, both cost- and revenue-based synergies contribute to acquisition performance. As noted earlier, cost-based synergies have commonly been the focus of M&A literature and practitioners. The primary substantive benefits of horizontal acquisitions have commonly been seen as stemming from increased cost efficiency gains through reduction in slack. Our results show that substantive benefits of horizontal acquisitions also come from increased revenues through enhanced market coverage and innovation capability. Not surprisingly, market coverage has a stronger impact on acquisition performance, as such benefits are more immediate than benefits from innovation capability which requires major changes in the way of operating a business and may take longer to translate into actual performance. The stronger impact of market coverage on performance can also be explained by the large proportion of cross-border acquisitions in the sample (70%).

We now turn to the discussion of each proposition.

***** Insert Figure 2 about here



Ambivalent effects of post-acquisition asset divestiture on cost savings

Hypotheses 1a. and 1b. argued that the post-acquisition divestiture of the acquirer's and the target's assets should improve acquisition performance through cost savings. The results reported in Figure 2 support Hypothesis 1a, since the divestiture of the acquirer's assets has a positive and significant effect on cost savings ($\gamma_{11} = 0.19$, $p < 0.01$). As noted before, the descriptive statistics (see Table 3) indicate that there is a low degree of divestiture of the acquirer's assets. However, the model coefficients indicate that when there is divestiture imposed on the acquirer's assets, it has a high positive impact on cost savings.

On the other hand, the results reported in Figure 2 do not support Hypothesis 1b. The divestiture of the target's assets has a negative and significant effect on cost savings ($\gamma_{12} = -0.09$, p

< 0.10). These results indicate that the process of rationalizing the target's businesses does not lead to systematic cost savings, and can even hurt costs. They also suggest that the acquirer is more effective in rationalizing its own assets than those of the target. These results are not surprising in the light of existing literature. We can argue that the acquirer has a better knowledge of its own assets than the target's. We can also argue that, when the acquirer decides to divest its own assets, a strong economic rationale drives such a process, while both economic and behavioral motives may drive the divestiture of the target's assets (which can also explain why the target is three to five times more likely to be downsized than the acquirer). Such behavioral motives, along with the magnitude of the target's divestiture, are likely to lead to the target's disruption, and to offset the benefits expected from a rationalization process.

We conducted complementary statistical tests to formally test Proposition 3, i.e., to check the significance of the differences between the two regression coefficients (γ_{11} and γ_{12}). We compared the fully-specified model with a nested model that constrains γ_{11} and γ_{12} to be equal. We then assessed the significance of the differences of their Log-likelihood⁸, which follows a Chi-square distribution⁹. The difference was significant ($\chi^2 = 3.54$, $df = 1$, $p \cong 0.05$). This result confirms that the coefficients γ_{11} and γ_{12} are statistically different, with γ_{11} having a higher explanatory power on cost savings variable than γ_{12} . In sum, the asymmetric effect on cost savings between the divestiture of the acquirer's assets and the divestiture of the target's assets was confirmed, providing support for Proposition 3.

Lastly, the empirical correlation between the divestiture of the target's assets and the divestiture of the acquirer's assets is positive and significant ($\phi_{12} = 0.22$, $p < 0.01$), suggesting that these two actions often take place jointly. Thus, if the direct standalone effect of target divestiture on cost savings is negative, some positive effect from this process may be captured when considered in combination with the acquirer's divestiture. In such a case, the joint divestiture of the target's and acquirer's assets suggests that a mutual recombination of the assets is targeted, instead of a standalone target divestiture. At the same time, and not surprisingly, this correlation suggests that, in many cases, target divestiture takes place independently of acquirer divestiture.

Turning now to the examination of cross-effects, we observe that asset divestiture has either no, or a negative, impact on revenue-enhancing capabilities. Once again, the cross-effects are asymmetric depending on the recipient of the divestiture measures. The effect of acquirer divestiture on capability is null (slightly negative, but not significant), while the effect of target divestiture is negative and significant on both market coverage ($\gamma_{22} = -0.11$, $p < 0.01$) and innovation capability ($\gamma_{32} = -0.11$, $p < 0.01$). Consistent with the post-acquisition literature, this result suggests that the divestiture of the target's assets does not help costs and may even damage capabilities.

To summarize, the results show that the divestiture of the acquirer's assets is an action rarely taken by the managers of the acquiring firms. However, when it does take place, it has positive results on cost savings, and no effects on capability enhancement. On the other hand, target divestiture, which is much more common, has deleterious effects on both cost savings and capability. Overall, these results show the difficulties in capturing the benefits of post-acquisition divestiture actions and support the limits raised by Scherer (1980) with respect to the effectiveness of acquisitions as a means for rationalizing assets.

Value-creating effects of post-acquisition resource redeployment on capability enhancement

Hypotheses 2a and 2b postulated that post-acquisition resource redeployment to both targets and acquirers should improve acquisition performance by enhancing market coverage and innovation capability.

The results reported in Figure 2 support both hypotheses since all parameters are significantly positive, as hypothesized ($\gamma_{23} = 0.17$, $\gamma_{24} = 0.28$, $\gamma_{43} = 0.16$, $\gamma_{44} = 0.29$, $p < 0.01$). These results show that post-acquisition resource redeployment to both targets and acquirers improves the revenue-enhancing capabilities of the merged firms. The flow and effectiveness of resource redeployment is bi-directional, suggesting the existence of a process of exploiting the acquirer's excessive resources, as well as a search process of exploring and acquiring new resources from the target. In the latter case, the target's resources can be leveraged and developed through the acquirer's support structure and systems. Finally, the empirical correlations between resource redeployment to targets and resource redeployment to acquirers is positive and

significant ($\phi_{34} = 0.30$, $p < 0.01$), suggesting that, in some cases, these two actions take place jointly.

As noted earlier, both types of resource redeployment are common, but are less likely to concern acquirers than targets. However, both types of redeployment seem to be as likely to enhance capabilities, contradicting Proposition 4. Following the procedure to test Proposition 3, we conducted statistical tests to formally test Proposition 4. No statistical differences were found. In sum, resource redeployment to both targets and acquirers creates value through capability improvement. However, this interpretation can be carried slightly further. Although we found no asymmetry in the effect on capability between resource redeployment to targets and redeployment to acquirers, there is a remaining negative and significant direct effect of resource redeployment to acquirers on acquisition performance. This result suggests that, once implemented, resource redeployment to acquirers can enhance capabilities, but can also damage overall acquisition performance. In sum, the outcome of the redeployment of the target's resources to the acquirer seems to be less predictable than the redeployment of the acquirer's resources to the target. This result is consistent with the post-acquisition literature which stresses the risk of damaging the target's resources in the process of using and redeploying them into the acquirer's businesses (Haspeslagh and Jemison, 1991). Most recent work has specifically focused on the post-acquisition tension that exists between the need to preserve and retain the target's resources and the need to leverage and redeploy them into a new organizational context (Ranft and Lord, 1998).

Lastly, the empirical correlation between the redeployment to targets and the redeployment to acquirers is positive and significant ($\phi_{34} = 0.30$, $p < 0.01$), reinforcing the positive effect of redeployment on capability enhancement. Complementary work on this issue highlights the important role of bilateral redeployment in improving capabilities of the newly combined target and acquiring businesses (Capron and Mitchell, 1998).

Turning now to the examination of cross-effects, we observe that resource redeployment has a neutral or a positive impact on cost savings. Resource redeployment to the target has a significant and positive effect on cost savings ($\gamma_{13} = 0.28$, $p < 0.01$). Resource redeployment to the acquirer has a similar positive, although nonsignificant, effect on cost savings. These results indicate that resource redeployment does not hurt costs, and may even contribute to achieving

higher cost efficiency. They also suggest that if standalone target divestiture does not provide the expected cost savings, changes in the way the target operates its businesses through the redeployment of resources to the target help reduce costs. This result is consistent with previous empirical work that shows that downsizing is more likely to create value when its scope extends beyond cutting costs through elimination of slack to include related changes in organizational design and resource reconfiguration (Anand and Singh, 1997; Nohria and Love, 1996). At a more general level, it is consistent with the shift in the emphasis from static sources of cost cutting through asset divestiture to more dynamic sources of efficiencies, i.e., those stemming from resource recombination.

Finally, we estimated the significance of the differences between the effects of resource redeployment to and from targets on capability enhancement and cost savings combined. We found a significant difference ($\chi^2 = 6.93$, $df = 3$, $p < 0.10$), which suggests that, overall, resource redeployment to targets is even more likely to create value than resource redeployment to acquirers. This result is consistent with Proposition 4, although Proposition 4 is not fully supported, as such differences have not been found significant when assessed separately for capability enhancement. It also confirms the greater risk of using the target's resources than the acquirer's resources.

To summarize, the results show that resource redeployment, both to and from targets, commonly follows acquisition. This provides empirical support for a resource-based interpretation of acquisitions that sees acquisitions as opportunities to redeploy strategic resources across merging businesses. The impact of such redeployment is very strong on revenue-enhancing capabilities (market coverage and innovation). Such redeployment can also be beneficial to cost efficiency, although we observed this effect only in the case of redeployment to targets.

Exploration of dynamic interplay between asset divestiture and resource redeployment

In this last section, we explore and speculate on the interplay between asset divestiture and resource redeployment. We previously stressed the existence of cross-effects of asset divestiture on capability enhancement, and of resource redeployment on cost savings. This already suggests that one cannot associate one source of value creation (cost versus revenue-based

synergies) with a single type of post-acquisition actions. Both resource redeployment and asset divestiture have interwoven effects on the two types of synergies.

Following this line of thought, we now turn to the examination of the correlations between asset divestiture and resource redeployment. Figure 2 indicates a positive and significant correlation between divestiture of the target's assets and resource redeployment to the target ($\phi_{23} = 0.50, p < 0.01$). Similarly, divestiture of the acquirers' assets has a comparable positive and significant correlation with resource redeployment to the acquirer ($\phi_{14} = 0.58, p < 0.01$). This suggests that resource redeployment can occur in many situations other than cases of downsizing, and is, by itself, an important outcome of horizontal acquisitions. On the other hand, it also suggests that resource redeployment is, in some cases, part of achieving cost efficiencies and accompanies a divestiture process.

Such interplay between resource redeployment to one of the merging businesses and the divestiture of that business's assets can be expected in many cases. For example, to achieve the benefits of economies of scale and scope, the firm may both redeploy resources and rationalize functional areas. In the same vein, our results indicate that mere disposal of the target's assets does not pay off unless accompanied by changes in the target's resources, i.e., the target receives resources from the acquirer.

Finally, the correlation between divestiture of the target's assets and resource redeployment to the acquirer is not significant, and, similarly, neither is the correlation between divestiture of the acquirer's assets and resource redeployment to the target. This indicates that the providing firm does not have its own assets divested, while the firm receiving new resources is likely to have part of its assets divested. This interesting result needs further examination beyond the context of the present research.

Overall, the examination of the interplay between asset divestiture and resource redeployment shows that acquisitions provide firms with opportunities to redeploy resources while rationalizing the assets of the firm receiving these new resources.

Control for sources of sample heterogeneity

In the final part of the empirical analysis, we controlled for the sensitivity of our results to potential sources of sample heterogeneity: horizontal scope, geographic scope, relative size of the merging firms, and diversified acquirers. Our previous results remain stable after including these control variables, although some significant effects should be pointed out. We found a positive and significant relationship between geographic scope and innovation capability ($r = 0.20$, $p < 0.01$). In other words, innovation capability is more likely to be improved in cross-border acquisitions than in domestic ones. We obtained a positive and significant relationship between relative size and cost savings ($r=0.10$, $p<0.01$), and between relative size and innovation capability ($r = 0.14$, $p < 0.01$). These results suggest that the higher the relative size of the target to the acquirer, the higher the impact of the acquisition on cost savings and innovation capability. Higher relative size of the target provides more opportunities for cost efficiencies and resource enhancement, which is consistent with the arguments developed in acquisition literature (Seth, 1990b). We also found a negative and significant relationship between the degree of acquirer diversification and innovation capability ($r = -0.14$, $p < 0.01$). This result suggests that the more an acquirer is diversified into unrelated businesses, the less likely it is that innovation capability will be enhanced through the acquisition.

CONCLUSION

This paper is intended to contribute to the debate on acquisition performance by exploring how post-acquisition asset divestiture and resource redeployment increase acquisition performance through cost savings and improved revenue-enhancing capabilities. Although the cost efficiency and resource-based rationales have been the dominant explanations for value creation in horizontal acquisitions, we are not aware of any large-scale empirical study that investigates the relationship between actual post-acquisition actions and long-term performance of acquisition over a large sample of U.S. and European firms.

We intend through this study to advance research on acquisition in five ways. First, this study addresses the strategic logic underlying horizontal acquisitions with a survey of actual post-acquisition actions on a large-scale basis, while previous studies essentially have relied on case studies. Second, by investigating the long-term implications of asset divestiture and resource redeployment, this study complements previous event-studies (Singh and Montgomery, 1987;

Lubatkin, 1987; Seth, 1990b). Third, we developed a set of measures that aims to capture a large spectrum of post-acquisition actions. We hope that this process will help develop further empirical tests of the ability of acquisitions to create value. Fourth, by investigating a wide range of differentiated post-acquisition actions which take place within one single type of acquisition, this study enriches the debate on the relationship between relatedness and acquisition performance, and overcomes the critique often addressed to previous studies which associated a type of acquisition with a type of synergy (Chatterjee, 1986). Finally, this study uses a structural model with latent variables to simultaneously assess the interrelations between post-acquisition actions, synergy types, and acquisition performance, while accounting for measurement error.

From a practitioner standpoint, we can draw several lessons. First, both cost and revenue-based synergies have to be considered when analyzing the value of a horizontal acquisition. Second, cost-based synergies, which have commonly been the focus of attention, are not easily achieved and may require more substantive changes in operating the business than those suggested by the dominant approach based on cost cutting and downsizing gains. Third, in this process of rationalization, the target tends to suffer damage and is much more likely to incur divestiture measures and face organizational disruption than the acquirer. Fourth, whether it accompanies a divestiture process or exists as a standalone motivation, resource redeployment is the dominant value-creating mechanism of acquisition, primarily through capability enhancement, but also to a lesser extent through cost savings. Capabilities related to market coverage tend to have the most immediate and strongest impact on acquisition performance, while the impact of innovation capability seems to be more volatile, requiring more fundamental organizational changes for the expected benefits to be translated into actual acquisition performance. Finally, although resource redeployment both to and from targets has value-creating potential, the use of the target's resources by the acquirer remains somewhat more problematic and less predictable than the use of the acquirer's resources in the target's businesses. Overall, the acquirer is better skilled at rationalizing its own assets and redeploying its own resources than rationalizing and using the target's assets and resources.

Although we have presented evidence from a large number of acquisitions in a varied set of industries and countries, this study is subject to the limitations that generally apply to cross-sectional survey-based research. First, the response rate, although typical, renders the conclusions

subject to potential response biases. Second, the cross-sectional nature of the survey limits our ability to account for a temporal dynamic regarding the hypothesized relationships. The use of a longitudinal survey would help overcome this concern. Third, the fact that our sample is focused on horizontal acquisitions initiated by manufacturing firms (although many different manufacturing industries were represented in the sample), limits the possibilities for generalization of our results. Studies including both non-manufacturing firms and non-horizontal acquisitions could obviously extend our findings.

As a direct extension of this research, several issues concerning the mechanisms of value creation in horizontal acquisitions remain. First, additional research could further test our results by investigating the relationship between the perceived measures of performance used in this research and secondary data capturing acquisition performance. Second, although heterogeneity in a sample is a condition for empirical generalization, industry or country-level studies would be useful to validate these results. For example, additional research could usefully compare the relevance of the theories of value creation in domestic, versus cross-border, acquisitions. Many studies suggest that cross-border acquisitions outperform domestic ones. More attention could be paid to these sources of performance differences. Third, further investigation could elaborate on the relationships between resource redeployment and performance. For example, it would be useful to understand the implications for acquisition performance of the type of resources redeployed, the direction of the redeployment (to targets versus to acquirers), and the scope of the redeployment (unilateral versus bilateral). Finally, it would be fruitful to explore the post-acquisition processes through which resources could be more effectively redeployed across merging firms. Such an approach would involve studying both the economic conditions leading to value creation as well as the firm's processes leading to the replication and retention of new resources within the merging firms.

At a more theoretical level, it would be useful to extend our analysis on how firms renew and recombine their resources by including alternative mechanisms of change. Such research would consider different modes by which firms change their set of resources, including internal development, discrete resource exchange, inter-organizational alliances, and business acquisitions. The goal of the research would be to identify systematic influences that lead managers to chose

among these modes of change and to measure their respective effectiveness on the firm's ability to change.

Endnotes

¹ Capacity divestiture through acquisition may also simultaneously serve a market power objective, as an acquisition represents a way of achieving economies of scale without adding new capacity on the market (Scherer, 1980). Dutz (1989) argues that the exploitation of economies of scale through acquisition makes even more economic sense in an industry plagued by overcapacity since the existence of idle assets provides the opportunity for downsizing and rearranging the remaining assets into a more efficient recombination. Market power motives often intertwine with scale-based motives of an horizontal acquisition.

² With respect to country distribution, it should be mentioned that French acquiring firms appear to be over-represented in the achieved data set, while American and British acquirers are under-represented. This is attributable to our stronger access to top French executives.

³ It should be mentioned that 25% of the respondents could not answer the questions from a consolidated standpoint since the target was still continuing to operate on a standalone basis. Conversely, 30% of the respondents could not answer the questions from a separate standpoint for the merging partners had been entirely integrated.

⁴ Structural modeling is appropriate to test the hypothesized model because of its ability to (1) consider multiple regressions simultaneously to permit the analysis of direct, indirect, and spurious relationships, (2) estimate models with latent variables, (3) estimate the loadings of each observed variable in the context of the full model rather than in isolation, (4) accommodate measurement errors in both dependent and independent variables, (5) accommodate reciprocal causation, simultaneity, and interdependence, and (6) account for correlations among error terms (Jöreskog and Sörbom, 1988; Bollen, 1989).

⁵ These eight first-order constructs correspond to a four-item target divestiture construct, a four-item acquirer divestiture construct, a five-item resource redeployment to target construct, a five-item resource redeployment to acquirer construct, a two-item cost reduction construct, a two-item innovation capability enhancement construct, a two-item market capability enhancement construct, and a four-item acquisition performance construct.

⁶ Internal consistency = $(\sum \lambda_{yi}^2) / ((\sum \lambda_{yi}^2) + \sum \text{var}(\epsilon_i))$. This measure is similar to Cronbach's alpha except that the latter assumes that each indicator of a construct contributes equally (i.e., the loadings are set equally to unity). Fornell and Larcker (1981) argue that their measure is superior to Cronbach's alpha since it uses the item loadings estimated within the causal model.

⁷ Average variance extracted = $\sum \lambda_{yi}^2 / (\sum \lambda_{yi}^2 + \sum \text{var}(\epsilon_i))$. The discriminant validity has been assessed by taking the square root of the 'Average variance extracted' whose formula is presented above (Fornell and Larcker, 1981).

⁸ The function of log likelihood is $-2 \log L + K$, where L is the likelihood function and K is a constant that depends only on the sample size of each group and the number of observed variables in each group.

⁹ In an analysis with missing data, Amos does not display a chi-square statistic for testing model fit. However, Amos gives the function of Log likelihood that can be used in much the same way as a chi-square statistic for model comparisons in the presence of missing data (Arbuckle, 1997). The current value of this statistic for the original full-specified model, which is 5145.79 (with 109 parameters), has been used as a baseline to compare the nested model that imposed additional constraints ($\gamma_{11} = \gamma_{12}$). Because of this additional constraint, this nested model will not fit the data as well as the original one, and so the function of log likelihood is larger (5149.33 with 108 parameters). The next step is to ensure that this difference is statistically significant. The difference in the function of log likelihood between the nested model and the original model follows a chi-square distribution with degrees of freedom equal to the difference in the number of parameters of the two models.

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Appendix : survey instrument

1. Post-acquisition divestiture measures

The following sections are designed to assess rationalization and restructuring measures that have been implemented **as a result of the merger**. Please answer the questions with respect to both the acquired business and the divisions or business units of your company that operate in the same industry as the acquired business.

CONSOLIDATION AND RESTRUCTURING OF R&D

Please give a **ROUGH ASSESSMENT** of the **proportion** of the physical **R&D facilities closed or resold**, the proportion of the **R&D personnel affected by the restructuring of R&D facilities**, and the proportion of the **R&D personnel cut as a result of the merger**.

Acquired business							
% of physical R&D facilities closed or resold (as a proportion of total physical R&D facilities)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
% of R&D personnel cut (as a proportion of total R&D personnel)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
Your existing business							
% of physical R&D facilities closed or resold (as a proportion of total physical R&D facilities)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
% of R&D personnel cut (as a proportion of total R&D personnel)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%

CONSOLIDATION AND RESTRUCTURING OF MANUFACTURING

Please give a **ROUGH ASSESSMENT** of the **proportion of the physical manufacturing facilities closed or resold**, the proportion of the **production capacity restructured**, and the proportion of the **manufacturing workforce cut as a result of the merger**.

Acquired business

% of physical manufacturing facilities closed or resold (as a proportion of total physical manufacturing facilities)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
% of manufacturing workforce cut (as a proportion of total manufacturing workforce)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%

Your existing business

% of physical manufacturing facilities closed or resold (as a proportion of total physical manufacturing facilities)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
% of manufacturing workforce cut (as a proportion of total manufacturing workforce)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%

CONSOLIDATION AND RESTRUCTURING OF DISTRIBUTION AND LOGISTICS SERVICES

Please give a **ROUGH ASSESSMENT** of the **proportion** of the physical **distribution facilities closed or resold**, the proportion of the **distribution capacity restructured**, and the proportion of the **distribution personnel cut as a result of the merger**.

Acquired business

% of physical distribution facilities closed or resold (as a proportion of total physical distribution facilities)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
% of distribution personnel cut (as a proportion of total distribution personnel)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%

Your existing business

% of physical distribution facilities closed or resold (as a proportion of total physical distribution facilities)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
% of distribution personnel cut (as a proportion of total distribution personnel)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%

CONSOLIDATION AND RESTRUCTURING OF SALES NETWORKS

Please give a **ROUGH ASSESSMENT** of the **proportion** of the **sales networks closed or resold**, the proportion of the **sales affected by the restructuring of sales networks**, and the proportion of the **sales personnel cut as a result of the merger**.

Acquired business

% of sales networks closed or resold (as a proportion of total sales networks)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
% of sales personnel cut (as a proportion of total sales personnel)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%

Your existing business

% of sales networks closed or resold (as a proportion of total sales networks)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
% of sales personnel cut (as a proportion of total sales personnel)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%

CONSOLIDATION AND RESTRUCTURING OF ADMINISTRATIVE SERVICES

Please give a **ROUGH ASSESSMENT** of the **proportion** of the **administrative services closed**, the proportion of the **administrative personnel affected by the restructuring of administrative services**, and the proportion of the **administrative personnel cut as a result of the merger**.

Acquired business

% of administrative services closed (as a proportion of total administrative services)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
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% of administrative personnel cut (as a proportion of total administrative personnel)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
Your existing business							
% of administrative services closed (as a proportion of total administrative services)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%
% of administrative personnel cut (as a proportion of total administrative personnel)	0%	1-10%	11-30%	31-50%	51-70%	71-90%	91-100%

2. Post-acquisition resource redeployment measures

The following sections ask questions about the transfer of resources, knowledge, and capabilities across the acquired business and your existing business. Please use the scale below to assess the extent to which people have been collaborating and resources have been transferred.

TRANSFER OF RESOURCES, KNOWLEDGE, AND CAPABILITIES

To what extent have you **used resources from the acquired business** to assist your existing business?

	NOT AT ALL	TO SOME EXTENT	TO A VERY LARGE EXTENT		
1. Use of acquired business's product innovation capabilities.....	1	2	3	4	5
2. Use of acquired business's know-how in manufacturing processes	1	2	3	4	5
3. Use of acquired business's marketing expertise.....	1	2	3	4	5
4. Use of acquired business's suppliers' relationship.....	1	2	3	4	5
5. Use of acquired business's distribution expertise.....	1	2	3	4	5

To what extent have you transferred **resources from your existing business** to assist the acquired business?

	NOT AT ALL	TO SOME EXTENT	TO A VERY LARGE EXTENT		
1. Transfer of product innovation capabilities to the acquired business.....	1	2	3	4	5
2. Transfer of know-how in manufacturing processes to ,the acquired business	1	2	3	4	5
3. Transfer of marketing expertise to the acquired business.....	1	2	3	4	5
4. Use of your existing business's supplier relations by the acquired business.....	1	2	3	4	5
5. Transfer of distribution expertise to the acquired business.....	1	2	3	4	5

3. Value-creating mechanisms

The following sections deal with the effects of the acquisition on performance.
 + **Answer SECTION A OR SECTION B**
Answer A if the acquired business has continued to operate mainly on a **stand-alone basis**.
Answer B if the acquired business has been substantially **integrated into your existing business**.

Answer SECTION A OR SECTION B

SECTION A. What has been the **impact of the acquisition on the position** of the **acquired business** and of **your existing business** in terms of:

	Acquired business					Your existing business				
	NEGATIVE IMPACT			POSITIVE IMPACT		NEGATIVE IMPACT			POSITIVE IMPACT	
	1	2	3	4	5	1	2	3	4	5
1. R&D capabilities										
2. Design cycle (shortening of the cycle of innovation/manufacturing/time to market)	1	2	3	4	5	1	2	3	4	5
3. Product cost	1	2	3	4	5	1	2	3	4	5
4. Input prices	1	2	3	4	5	1	2	3	4	5
5. Broadening of product line	1	2	3	4	5	1	2	3	4	5
6. Geographical coverage	1	2	3	4	5	1	2	3	4	5

SECTION B. What has been the **impact of the acquisition on the position** of the **consolidated business** in terms of:

	The consolidated business				
	NEGATIVE IMPACT			POSITIVE IMPACT	
	1	2	3	4	5
1. R&D capabilities	1	2	3	4	5
2. Design cycle (shortening of the cycle of innovation/manufacturing /time to market).....	1	2	3	4	5
3. Product cost.....	1	2	3	4	5
4. Input prices	1	2	3	4	5
5. Broadening of product line	1	2	3	4	5
6. Geographical coverage	1	2	3	4	5

4. Acquisition performance

Answer SECTION A OR SECTION B

SECTION A. Since the acquisition, how have the **market share, sales, and profitability of the acquired business** and of **your existing business** changed?

	Acquired business					Your existing business				
	SIGNIFICANT DECLINE			SIGNIFICANT INCREASE		SIGNIFICANT DECLINE			SIGNIFICANT INCREASE	
	1	2	3	4	5	1	2	3	4	5
1. Market share	1	2	3	4	5	1	2	3	4	5
2. Sales	1	2	3	4	5	1	2	3	4	5
3. Intrinsic profitability (Profit/capital employed) 5		1	2	3	4	5	1	2	3	4
4. Profitability relative to industry average	1	2	3	4	5	1	2	3	4	5

SECTION B. Since the acquisition, how have the **consolidated business's market share, sales, and profitability** changed?

	The consolidated business				
	SIGNIFICANT DECLINE		SIGNIFICANT INCREASE		
1. Market share	1	2	3	4	5
2. Sales	1	2	3	4	5
3. Intrinsic profitability (Profit/capital employed)	1	2	3	4	5
4. Profitability relative to industry average	1	2	3	4	5

5. Control questions

Pre-acquisition relatedness. Please **compare your existing business with the acquired business** just before the acquisition.

	ABSOLUTELY	NOT AT ALL				
		1	2	3	4	5
1. Your products were similar		1	2	3	4	5
2. Your technology was similar		1	2	3	4	5
3. Your geographical markets were similar		1	2	3	4	5
4. The types of customers to which you sold were similar		1	2	3	4	5
5. You were direct competitors		1	2	3	4	5

Relative size. Relative proportion of the acquired business's annual sales in comparison to your firm's sales before the acquisition (in the line of business concerned):

1. < 25%
2. 25-49%
3. 50-74%
4. 50-74%
5. > 100%

Acquirer's degree of diversification:

1. Conglomerate diversified into unrelated businesses
2. Firm diversified into related businesses
3. Firm focused on one main business