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Untangling the Integration–Performance Link: Levels of Integration and Functional Integration Strategies in Post-Acquisition Integration

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ABSTRACT The integration–performance link created during post-acquisition integration has defied satisfactory theoretical explanation. To address this gap, we conduct a functional analysis to explore the intermediating mechanisms between the level of integration – which represents the extent of the target firm's integration with the acquirer – and acquisition performance. We use six in-depth acquisition case studies in the medical technology industry to develop an integrated model with which to untangle the integration–performance link. First, our model connects the level of integration to specific functional integration strategies, which refer to the approaches acquirers employ to manage functional resources. Second, we identify value creation and value leakage as the two routes through which functional integration strategies impact acquisition performance. Finally, we propose two qualitative measures of acquisition performance: value gap and time delay. Our study suggests that a functional analysis of the integration–performance link may help resolve long-standing conflicts within the literature.

Keywords: acquisition performance, level of integration, integration strategy, post-acquisition integration

INTRODUCTION

Acquisitions generally fail to achieve the acquisition performance acquirers expect (Thanos and Papadakis, 2012). While the cause of this failure is commonly thought to involve the management of post-acquisition integration (PAI; Graffin et al., 2016), there is no satisfactory explanation of why underperformance is so prevalent. In PAI, value creation is accomplished when the potential value the acquirers identified before the acquisition is achieved (Graebner et al., 2017; Steigenberger, 2016). Failure to realise

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this full available value is known as 'value leakage', and is defined as the dissipation of the value expected by acquirers (Gates and Very, 2003). Prior research shows that value leakage plays an equal part in determining final acquisition performance (Csiszar and Schweiger, 1994; Gates and Very, 2003; Meyer, 2008; Teerikangas et al., 2011). Thus, even the highest value creation expectations can be toppled by value leakage through unanticipated problems and barriers (Meyer, 2008; Teerikangas and Thanos, 2018). The challenge then becomes how to manage PAI to realise value creation potential and achieve the expected acquisition performance.

Managers seeking to succeed in managing PAI need a deep understanding of the integration–performance link. This link is complex and is largely affected by integration strategy – the approach taken to manage resources with the aim of creating value for acquirers (King et al., 2008). Due to its critical role, integration strategy has attracted the attention of scholars from both quantitative and qualitative schools. Quantitative studies commonly treat integration and autonomy as two dimensions of integration strategies (e.g., Puranam et al., 2006, 2009; Zaheer et al., 2011). A more comprehensive approach is typically adopted in qualitative studies. These studies point to typologies of integration strategies (Haspeslagh and Jemison, 1991), the degree of relatedness between the acquirer and target firm (Angwin, 2012), and four modes of acculturation (Nahavandi and Malekzadeh, 1988). However, both qualitative and quantitative studies concur that integration strategies have mixed and complex effects on acquisition performance (Faulkner et al., 2012). The literature is also split over whether features related to integration strategies such as integration speed impact acquisition performance positively or negatively (Bauer and Matzler, 2014; Epstein, 2004; Ranft and Lord, 2002).

Untangling the integration–performance link can assist in resolving this confusion over how integration strategies affect acquisition performance. In PAI, functional integration strategies evidently experience value leakage while also creating value for acquirers (Gates and Very, 2003). These functional integration strategies are determined according to the level of integration – the extent to which the target firm is integrated into the acquirer (Cording et al., 2008). Therefore, we suggest that a promising avenue for exploring the integration–performance link is to conduct a functional analysis aimed at pinpointing the mediating dynamics running from the level of integration to acquisition performance.

However, the research has little to offer regarding the function-specific mechanism that determines acquisition performance. A handful of studies identify the role of target firm managers (Graebner, 2004), acquirer integration managers (Teerikangas et al., 2011), and investors (Paruchuri et al., 2006) in creating value for acquirers. Other studies explore structural integration (Puranam et al., 2009), interunit collaboration (Kretschmer and Puranam, 2008), and a hybrid approach (Schweizer, 2005) in PAI. These studies investigate specific actors and intermediating mechanisms, but only Teerikangas and Thanos (2018) examine functional mediating dynamics to explore the integration–performance link. However, their grounded model stops short of connecting each functional integration strategy with its associated value creation and value leakage. We thus extend their work to gain a better understanding of how acquisition performance is built up and achieved via a functional analysis.

We then trace how to develop functional integration strategies for each level of integration, and the consequent and cumulative effects of value creation and value leakage

upon acquisition performance. Our overarching research question is as follows: '*Taking a functional analysis, how does the level of integration affect acquisition performance from the acquirer's perspective?*'. To investigate this question, we employ six in-depth case studies of acquisitions within a single industry. We collect data on activities related to each function during PAI as well as on the value created or lost through leakage attributable to each function.

Our analysis identifies PAI patterns, from which we develop a theory based on a functional analysis conducted to explain the integration–performance link. First, we connect the levels of integration to functional integration strategies; this drives our analysis down to the functional level. We then investigate the dynamics between integration and autonomy for functional resources for each functional integration strategy. Second, we explore the two routes from functional integration strategies to acquisition performance: value creation and value leakage. We show how the constructs of value creation and value leakage are central to understanding the intermediating mechanism that results in acquisition performance. Third, we expand the literature on the qualitative assessment of acquisition performance. We argue that qualitative measurement should take into account not only the attainment of acquisition goals but also how these goals are achieved, by establishing how value leakage affects expected value creation in a functional analysis. We identify two novel constructs of acquisition performance: value gap and time delay. Our study also deepens our understanding of the relationship between integration speed and acquisition performance.

THEORETICAL BACKGROUND

Acquisition Performance: Result of Value Creation and Value Leakage

The emergence of the concept of 'acquisition performance', defined as the amount of value the acquirer captures from an acquisition (King et al., 2004), has prompted scholars to develop various measures with which to better understand its complex theoretical facets (Cording et al., 2010; Thanos and Papadakis, 2012). Since any given measure may capture only one dimension of a construct's content domain (Shaver and Mezias, 2009), studies employ a range of different acquisition performance measures. These fall into two broad categories: objective measures and subjective measures (Cording et al., 2010). Objective measures are mainly used in announcement effect event studies (Fama et al., 1969), for long-term stock performance (Lubatkin, 1987), and for returns based on accounting data (Montgomery and Wilson, 1986).

By contrast, subjective measures offer a holistic view of PAI, and are better able to capture fine-grained value-creating mechanisms (Capron, 1999). These are dominant in qualitative studies (e.g., Graebner, 2004; Schoenberg, 2006; Teerikangas and Thanos, 2018; Vaara, 2002). Subjective measures usually reflect managers' assessments of acquisition success (Graebner, 2004), achievement of objectives (Angwin, 2004; Datta, 1991), comparison with main competitors (Child et al., 2001/2003), expert financial press commentary (Datta and Grant, 1990), multiple respondents' assessments (Bowman and Ambrosini, 1997), and narratives of success (Vaara, 2002). However, none of these subjective measures can identify or capture the complexity within PAI that results in

acquisition performance. This complexity has a time signature. Acquisition performance varies following acquisition, tending to be negative during early PAI and often becoming positive in the longer term (Quah and Young, 2005). These dynamics require scholars to move away from examining the complexity of the integration–performance link statically.

Only a handful of conceptual and qualitative studies have examined the dynamics and complexity within PAI, particularly in terms of value creation and value leakage (Csiszar and Schweiger, 1994; Gates and Very, 2003). For the acquirer, value creation describes the capture of the expected value they had identified pre-acquisition (Graebner et al., 2017; Steigenberger, 2016). Acquirers accomplish this task by redeploying resources across the acquirer and target firm (Colman and Lunan, 2011; Haleblian et al., 2009). Csiszar and Schweiger (1994) analyse the inflows and outflows of value in an acquisition that make up the value creation process. A number of studies have investigated the constructs of value creation, such as market power (Eckbo, 1983; Stillman, 1983), economies of scale and scope (Seth, 1990), coinsurance (Kim and McConnell, 1977), and diversification of risk (Haugen and Langetieg, 1975). Schweiger and Very (2003) condense these constructs as cost, revenue, market power, and intangibles.

On the other hand, complexity and uncertainty during PAI are challenges that diminish value creation, leading to value leakage. This leakage comprises the dissipation of the acquisition's potential value, or the negative impact of the acquisition upon the intrinsic value of either firm (Gates and Very, 2003). Value leakage cannot be eradicated from attempts to preserve or realise expected value (Csiszar and Schweiger, 1994). Most of the research has focused on identifying various constructs of value leakage; these include the losses inherent in rent-seeking and implicit costs (Meyer, 2008), individual uncertainty and ambiguity (Larsson and Risberg, 1998), organisational politics (Hambrick and Cannella, 1993; Schweiger et al., 1987), the voluntary departure of key people (Buono and Bowditch, 1989), loss of customers (Hax and Majluf, 1996), competitors' reactions (Gates and Very, 2003), and cultural resistance (Larsson and Risberg, 1998).

However, simply recognising some of the constructs of value creation and value leakage is a long way from capturing the underlying mechanism generating acquisition performance. The research shows that the realisation of acquirer value depends on the precise integration strategy – the redeployment of resources (King et al., 2008). This redeployment is implemented by reconfiguring the value chains of both the acquirer and the target firms, thus bringing the analysis down to the functional level. It follows that any analysis of value creation and value leakage should be conducted at this same level – that is, by exploring functional integration strategies.

However, despite research appeals to pay attention to the microdynamics underpinning acquisition performance (Haleblian et al., 2009; King et al., 2004; Meglio and Risberg, 2011), only a handful of studies have attempted to link functional integration strategies and acquisition performance. For example, Schweizer (2005) proposes that management adopt a hybrid integration approach that allows more integration activities in some functions than in others. Teerikangas and Thanos (2018) explore how integration-related processual, behavioural, and cultural factors affect functional mediators. Despite these useful contributions, few studies have explored the connections between each functional integration strategy and its associated value creation and value leakage.

Level of Integration: Antecedents of Functional Integration Strategies

The PAI process comprises two central but differing concepts: level of integration and integration strategy. The literature (Cording et al., 2008; King et al., 2004; Teerikangas and Joseph, 2012) indicates that the level of integration[1] can be seen as the extent to which the target firm is integrated into the acquirer. This signifies the extent of the change between a target firm and an acquirer across functions. By contrast, integration strategy is, as noted, the approaches adopted to manage resources with the aim of capturing value for acquirers (King et al., 2008). This concept relates to the changes made during PAI and is directly relevant to value creation for acquirers. Therefore, the literature indicates that the level of integration is an antecedent and a determinant of functional integration strategies.

The level of integration within PAI lies along a spectrum, ranging from acquisitions with little integration, through partial integration, to near total integration (Pablo, 1994). These states are usually described as low, moderate, and high levels of integration, respectively (Child et al., 2001/2003). A low level of integration entails a more cautious, selective consolidation and seeks to preserve the autonomy of the target firm (Ellis et al., 2011). A moderate level of integration indicates that the acquirer and target firm are interdependent in their functional activities after acquisition (Haspeslagh and Jemison, 1991). A high level of integration emerges when certain functional areas, such as production and/or marketing functions, are combined to create economies of scale and scope (Cording et al., 2008).

The relation between the level of integration and integration strategy is described by Haspeslagh and Jemison (1991). They identify and explore four types of integration strategies: absorption, symbiosis, preservation, and holding. We exclude holding from consideration, as this is normally reserved for financial acquisitions with minimal or no integration. The three other integration strategies each corresponds to a specific level of integration. A high level of integration implies that absorption is used as the integration strategy, while moderate and low levels of integration are related to the integration strategies of symbiosis and preservation, respectively. However, the connections within this schema do not touch upon the functional level. The relation between these levels of integration and functional integration strategies remains obscure. Further enquiry is required to untangle the integration–performance link.

Adopting a functional analysis of PAI has been endorsed by the research (Lindgren, 1982) as a way to explore the nature and causes of PAI (Håkanson, 1995), to identify the intermediating mechanisms (Bauer and Matzler, 2014), and to illustrate the complexity of the relationships with external actors (Oberg, 2008). A functional analysis examines the mediating dynamics of the integration–performance link by connecting levels of integration, functional integration strategies, value creation and value leakage, and acquisition performance. Adopting this research design enables us to extend the recent work by Teerikangas and Thanos (2018) and explore the connection between each functional integration strategy and its associated value creation and value leakage. Finally, though acquisitions necessarily involve at least two firms (Meglio and Risberg, 2011), we focus on acquisition performance on the acquirer's side, and thus adopt the acquirer's perspective on the integration–performance link.

METHOD

We chose a multiple-case design to investigate our research question in order to better anticipate complexity within the integration–performance link and to generate richer insights (Napier, 1989; Schweizer, 2005). This type of case design offers the greatest potential for generalisation to theory and proposition development for theory testing (Eisenhardt, 1989; Yin, 2009).

We narrowed our cases to those within a single industry to avoid the problems associated with conducting an in-depth analysis across multiple industries (Schweizer, 2005) and to minimise extraneous variability (Eisenhardt, 1989). The medical technology industry is an excellent study context, for several reasons. First, the medical technology industry has become a variable environment due to the regulatory dynamics across countries and the rapidly increasing market size in healthcare. In this environment, acquisitions can be based on a large variety of strategic motives, increasing the chances of a fit with each level of integration. Second, due to technological barriers, acquirers often pay a premium for the target firm that is higher than that paid in many other industries. This intensifies the imperative to create more value and the motivation to stem value leakage. Therefore, we expect value creation and value leakage to be heightened in this industry, and so be readily amenable to observation.

Five criteria guided our case selection in the medical technology industry. First, we sought an equal number of cases for each level of integration (two cases for each level) to balance the sample and ensure comparability between cases. Second, each acquisition had to have achieved the value expected by the acquirers at least partly, to ensure that we had sufficient data for value creation and value leakage. Third, to cover the critical features, we selected our cases from three major segments in the medical technology industry – surgical and medical instruments, orthopaedic devices and hospital supplies, and electromedical equipment – which account for more than eighty percent of the market. Fourth, to minimise the possible spurious effects of national culture (Lee et al., 2015), our sample acquirers are UK/US-based firms, which are famous for their aggressive PAI approach (Faulkner et al., 2003). Fifth, given that target ownership and size are known to affect the complexity of PAI (Teerinkangas and Irrmann, 2016), we ensured diversity in target ownership (public and private) and firm size (large and small) in our sample to dilute these effects.

We employed a range of approaches to obtain high-quality data. The university institute at which one of the authors studied for her Ph.D. degree operates a consulting firm. Each consultant has over 20 years of experience in the industry, and some consultants were involved in engagements at the executive level. The industry links of this consulting firm helped us to gain full access to the first two case firms. Further case firms then came forward due to the trust established between the researchers and these two firms. Talks and seminars given at the institute provided opportunities for the researchers to meet corporate executives in person, which made the granting of full access possible. Informants in our case firms were sometimes willing to share their contacts with other firms within their industrial sector.

We determined the optimal number of cases by conducting a cross-case comparison along with the data collection. After completing the sixth case, we found that we were

unable to generate further insights from the data and that the results were repetitive. This indicated the attainment of research maturity and the exhaustion point for our data collection (Glaser and Strauss, 1967; Yin, 2009). This number also aligns with Eisenhardt's (1989) suggestion that four to ten cases are typically sufficient. Tables I and II provide general information on each of these six cases.

Table I provides the key information for each case. This includes the region and number of employees in the acquirer and target firm, target ownership, target size, transaction date, transaction price, acquisition effects, acquisition rationale for the acquirer and target firm, industry sector, integration duration, level of integration, and interview time. Table II illustrates the success of the acquisition in terms of the acquisition leaders' perceptions. In our cases, the acquisition leaders are the executives who take the responsibility for value creation in PAI, such as directors and vice presidents. In Case B, the acquisition leader was with the target firm.

Empirical Data

Our empirical data consist of interviews and archival data. Table III describes the interview data and private archival data used for our study. For the interviews, we present the informant's organisation level (executive or manager), the informant's position and responsibilities, and the number of face-to-face or telephone interviews conducted. Regarding private archival data, we provide details on the internal documents obtained for each case, and distinguish between pre- and post-acquisition documents. In our cases, the acquirers are from the UK and the USA, while there are no constraints on the nationalities of target firms; they span the world, including Germany, Italy, Switzerland, China, the UK, and the USA.

Interviews. Semi-structured interviews were the primary data source, with the main collection extending from late 2008 until the second quarter of 2010. However, we extended this period to 2014 to allow Case D2 to complete its PAI, which took much longer than expected. There is a lag between the time of the PAI and the time we collected the data for some of the cases (e.g., cases A1, B, and D1). We took several steps to control for retrospective bias created by this time lag. First, we included multiple informants to capture a breadth of experiences and views on PAI. The consistency of data across informants helps to support the validity of the data collection. Second, we employed archival data to triangulate the interview data. When conflicts emerged, we conducted further interviews to seek more information.

As our study focuses on the acquirer's perspective, we ensured that at least one informant from the executive or manager level was originally from the acquirer. Whenever there was a difference in judgment between acquirer and target firm, we chose the acquirer's view. For some cases (e.g., Case B and Case D2), we had to rely on data provided by informants originally from target firms because they were the key persons conducting PAI. As a remedy, we triangulated archival and interview data on PAI activities to verify the testimony of the informants and check whether these data were from the acquirer's perspective. In our pool, two informants originated from the target firms, while 24 others originated from the acquirers (see Table III).

Table I. Case selection

	Acquirer		*Target firm*					*Acquisition rationale*					
Case No.	*Region*	*Employee number*	*Region*	*Employee number/ ownership*	*Deal time*	*Interview time*	*Transaction Price*	*Acquirer*	*Target firm*	*Level of integration*	*Industry sector*	*Effects on the industry*	*Time duration of integration*
A1	UK	2,000	Germany	20/Private	1 Dec. 2005	Nov. 2008 – Aug. 2009	$22.5M in cash, and $5.6M earnout	Complete product portfolio, Protect market position, expand sales channels and increase manufacturing capability	Achieve global sales reach and service organizations, and increase value of products	Low	Electromedical equipment	An acquisition initiated by the No.3 company in the sector to step into a fast growing market	1 year
A2			Italy	26/Private	23 March 2007	Nov. 2008 – Aug. 2009	$11.3M in cash, and $9M earnout	Acquire competing strategic products, and expand into the European market	Achieve global sales reach and service organizations, obtain funds for financial problems, and address the resignation of the vice chairman (VC)	High		An acquisition initiated by the No. 3 company in the sector	1.5 years

Table I. *Continued*

	Acquirer		*Target firm*					*Acquisition rationale*					
Case No.	*Region*	*Employee number*	*Region*	*Employee number/ ownership*	*Deal time*	*Interview time*	*Transaction Price*	*Acquirer*	*Target firm*	*Level of integration*	*Industry sector*	*Effects on the industry*	*Time duration of integration*
B	USA	114,000[a]	UK	5,300/ Public	21 July 1998	Jan. 2009 - July 2010	$35.00 per share, $3.5B in total, cash offer	Acquire a full line of products in orthopaedics sector, expand to international market, and aggressively become No.1 or 2 in the market	Group wanted to sell, in order to narrow their focus on pharmaceuticals	High	Orthopaedic devices and hospital supplies	The first largest consolidation in the orthopaedics sector to date	2 years
C	UK	10,000	Switzerland	830/Private	1 March 2th, 2007	June 2009 –Feb. 2010	$889M in cash	Rationalize products for cost reduction, and expand into European and Chinese markets	Obtain financial rewards	Moderate		A large acquisition (No.4 wants to step into Top 3)	20 months
D1	UK	7,500	USA	2000/Public	6 Dec. 2004	March 2009 –Feb. 2010	$925M in cash	Acquire a new competitive product and rationalize sales and manufacturing networks	Address the problem of the withdrawal of private equity	Moderate	Surgical and medical instruments	A large acquisition	3 years
D2			China	110/Private	28 Nov. 2008	2009 March Feb. 2009 – Feb. 2010; May -June 2014	$10.6M in cash	Acquire a well-sold product in specific regions and expand into emerging markets	Obtain financial rewards and sell pumps beyond China	Low		A large acquisition in an emerging market	4.5 years

[a]Number of employees in total but not all in the medical field.

Table II. Success of each acquisition case according to the perceptions of acquisition leaders

Case No.	*Acquirer's acquisition motives within the category*	*Retrospective categorical assessment*	
		Assessment	*Details*
A1	Specific R&D capabilities and expertise acquisition	Partly achieved	Some acquired senior staff could not get used to their newly assigned subordinate roles and left after the acquisition
	Strategic product acquisition	Achieved	Obtained image guided radiotherapy (IGRT) and stereotactic radiotherapy (SRT) products
	Accessing to quickly growing and profitable areas	Partly Achieved	One of Target A1's larger customers was Acquirer A's competitor, this firm switched to other suppliers
A2	Software acquisition	Achieved	Successfully transferred the acquired software to Acquirer A's business
	Technology acquisition	Achieved	Maintained the acquired R&D function
	Acquired software related market expansion	Partly achieved	Insufficient after-sales support staff for the expanded market and limited integration funds rising from unexpected delay in the timing of savings from rationalization
B	Completing product portfolio on orthopaedic products	Achieved	Established a complete line of orthopaedic products
	Expanding Acquirer's business across the European market	Partly achieved	Market has been expanded to regions beyond America. However, market expansion was delayed because of the underestimation of high integration costs and additional human resources needed to standardize operations and marketing
C	European market expansion	Partly achieved	Expansion was disrupted because of ethically questionable payments to surgeons and problematic cross-selling of similar products
	Market position enhancement	Partly achieved	Acquirer C's position in the Chinese market was strengthened, but the European market was not boosted as expected because of cross-selling failure
D1	Strategic product acquisition (safety catheters)	Achieved	Acquired safety catheter products
	Specific market access (safety healthcare market)	Partly achieved	Gained access to the safety healthcare market. However, the future market was not as large as Acquirer D expected
	American market enhancement	Partly achieved	Sales network rationalization saved large costs. However, cross-selling failure emerged because of the refusal of distributors engage in cross-selling, and the momentum of sales force was reduced
	Product portfolio rationalization	Achieved	Removed the unwanted products from the acquired business

Table II. *Continued*

Case No.	*Acquirer's acquisition motives within the category*	*Retrospective categorical assessment*	
		Assessment	*Details*
D2	Strategic product acquisition	Achieved	Acquired and standardized Target D2's products
	Become the market leader within the Chinese market	Partly achieved	Obtained more than seventy percent of Chinese market share. However, the market share dropped to thirty percent later because customers switched to their competitors
	Other emerging market expansion	Partly achieved	The time taken to expand to other emerging markets was extended because of the delay in standardizing the product development process

We interviewed nine executives and 17 managers across six cases. We conducted 69 interviews, of which 40 were face-to-face and 29 were conducted by telephone. Each face-to-face interview lasted between 120 and 150 minutes. The telephone interviews support our face-to-face interview data. The primary aim of the telephone interviews was to introduce the researchers and our study to the informants as a warm-up, and also to explain to the informants how to prepare for the first face-to-face interviews. The telephone interviews were generally 15–20 minutes long. After the face-to-face interviews, we sometimes needed a further telephone interview to fill in missing information or to seek clarification. This type of telephone interview often took around 30 minutes. All the interviews were audio recorded and transcribed verbatim. The transcripts for each case formed the basis of the case reports, which we returned to the informants for verification to ensure research validity (Miles and Huberman, 1994).

We used an interview protocol (see the appendix) to guide the semi-structured interviews. This protocol covered the post-acquisition process: functional PAI activities, value captured or lost through leakage from each function, and acquisition performance. Informants at the executive level were encouraged to provide a general view on whether they attained the expected value according to each acquisition goal. We then asked the informants at the manager level to provide data at the functional level. Managers were requested to map the post-acquisition activities in each function and to evaluate the value created from each activity from the acquirer's perspective, including both '*quick wins*' and '*longer-term benefits*'. To gain insights into value leakage, managers also provided data on the problems associated with creating value within each function. They were asked further questions about the effects of these problems and the acquirers' solutions to them. To establish the acquirer's perception of acquisition performance, we also collected comparative data on expected and achieved value from the acquisition.

This interview protocol was developed in three stages. First, we worked out a set of questions based on our research question (Stake, 1995; Yin, 2009). These questions focused on the 'what', 'why', and 'how' of each PAI activity to avoid having any subjective views of the researchers interfere with the study. These questions served as the initial draft of our interview protocol. Second, to avoid leading questions and ensure that the

Table III. Data collection

		Interview				*Private archival data*	
				Number of interviews			
Case No.	*Time for collection*	*Informant's organizational level (total number)*[a]	*Position & Responsibility*[b]	*Face-to-face*	*Telephone*	*Pre-acquisition*	*Post-acquisition*
A1	2009	Executive (3)	Director of Strategic Projects	1	0	Due diligence slides, Due diligence report, preliminary report and integration plan	N/A
			Director of Business Development	2	1		
			Product Director	2	2		
		Manager (2)	Operations Manager	1	1		
			Product Manager	1	1		
		Total number of interviews for Case A1		7	5		
A2	2009	Executive (3)	Vice President of R&D	1	0	Due diligence slides, preliminary report, and integration plan	N/A
			Director of Strategic Projects	1	1		
			Product Director	2	2		
		Manager (3)	Operations Manager	1	1		
			Product Manager	1	1		
			R&D Manager	1	1		
		Total number of interviews for Case A2		7	6		
B	2009–2010	Executive (2)	Director of Global Concept Development*	4	1	Due diligence report	N/A
			Vice President of M&As	1	1		
		Manager (2)	Product Manager	1	1		
			Operations Manager	1	1		
		Total number of interviews for Case B		7	4		

Table III. *Continued*

		Interview				*Private archival data*	
				Number of interviews			
Case No.	*Time for collection*	*Informant's organizational level (total number)*[a]	*Position & Responsibility*[b]	*Face-to-face*	*Telephone*	*Pre-acquisition*	*Post-acquisition*
C	2009	Executive (2)	Corporate Finance Director,	1	1	N/A	Integration plan report
			Director of Strategy & Business development	2	1		
		Manager (3)	Human Resource Manager	1	1		
			Product Manager	1	1		
			Sales Manager	1	1		
		Total number of interviews for Case C		6	5		
D1	2009–2010	Executive (1)	Director of Strategic Programmes	2	1	Due diligence report	N/A
		Manager (2)	Product Manager	1	1		
			Sales Manager	1	1		
		Total number of interviews for Case D1		4	3		
D2	2009–2010, 2014	Executive (1)	Director of Strategic Programmes	2	1	N/A	N/A
		Manager (5)	Human Resource Manager	2	1		
			Sales Manager*	2	1		
			Customer Service Manager	1	1		
			R&D Manager	1	1		
			Production Manager	1	1		
		Total number of interviews for Case D2		9	6		
Total number of interviews				40	29		

[a]In our study, executive level refers to informants who have a responsibility for a business, at least at the director position. Manager level refers to middle managers, including senior and junior managers in each function.
[b]An asterisk (*) indicates informants who were previously employed by the target firms. Informants without an asterisk are from the acquirers.

questions were meaningful in terms of business practice, we sent the interview protocol to practitioners with experiences in many international acquisition deals. Third, to confirm that we had eliminated leading questions, we retested the revised interview protocol in three pilot studies.

In testing the effectiveness of our interview protocol, we did not limit these pilot studies to the medical technology industry. Details on these pilot studies are provided in Table IV. For each pilot case, we provide essential information, such as the region and ownership of the acquirers and target firms, deal time, interview time, transaction price, acquisition rationale for the acquirers and target firms, positions of informants, industry sector, and duration of integration.

One of the authors conducted all the interviews and discussed the collected data with the other author to reveal further insights. During our interviews, we did not always adhere to the questions listed in the interview protocol, but rather encouraged the informants to narrate their experiences. We were prepared to follow the informants' lead, anticipating that this process might reveal something important to our research. To increase accuracy, we sought examples to support each assertion. We also looked at whether the informants paused or hesitated when responding to our questions. From these breaks, we were able to infer that informant recall was obstructed, and we asked additional questions to explore further or returned to these questions in later interviews. To mitigate any unwanted influence, we were careful to control our gestures and expressions to avoid revealing what we were thinking about our informants' responses. To prevent leading questioning, we asked broad questions about the informants' opinions and extended our coverage to all PAI activities.

Observations were also critical for our data collection. Although we did not employ observational data directly in our study, they supported our main data collection through interviews. We went to the factories and offices of each case firm to observe its natural setting. Our observations typically took one day in the factory and two to three days in the offices. We observed our informants within meetings or conversations with colleagues, noting their traits and behaviours in normal working conditions. Gaining familiarity with the informants improved our understanding and reduced the possibility of leading questions. Observation also helped detect emotional fluctuations during the informants' recollection during the interviews. Any emotional episodes enabled us to ask further questions to deepen our data. Sometimes, we observed conflicts between our informants within the firm, making us aware of differences in opinion during the interviews.

Archival data. We collected public data from case firm websites, media reports related to the acquisition, and industry analyses. We focused on announcement information, tracking information about the post-acquisition period, and acquisition performance. We also collected basic industry statistics, acquisition trends, and up-to-date acquisition news within our three industry segments. Our private archival data included due diligence reports (e.g., reports by consulting firms, such as Roland Berger), integration plans, and integration progress checklists. Of these data, the due diligence reports outline the strategic rationale for the acquisition and financial evaluation models. These strategic rationales and evaluations appeared in extended form in the integration plan in great detail, giving the expected timeframes for implementation. During PAI, integration progress checklists were used to review the integration plan in practical and

Table IV. Details of three pilot studies

Case No.	*Acquirer*		*Target firm*		*Deal time*	*Interview time*	*Transaction Price*	*Acquisition rationale*		*Informants*	*Industry sector*	*Time duration of integration*
	Region	*Ownership*	*Region*	*Ownership*				*Acquirer*	*Target firm*			
Pilot 1	UK and Netherlands	Public	USA	Public	10 Feb. 2000	February 2008 -April 2008	$20.3B in cash, $73 per share	Enter a fast growing area of healthy food, enhance the US market, and cost reduction through rationalization	Expand into the European market, and gain financial rewards	Senior vice president in the supply chain, and a product manager	Consumer foods	2 years
Pilot 2	UK	Public	USA	Private	17 April 1996	March 2008 -June 2008	$28M in total, with $23.2M in cash	Access to the US market, enhance the UK market, and complete the product portfolio in critical care applications	Access to the UK market, and gain financial rewards	Director of business and legal affairs, a manager of operations	Infusion therapy business	1 year
Pilot 3	UK	Public	USA	Public	8 Dec. 1998	May 2008 -September, 2008	$335M in total, $7.25 per share	Transformation into the world's leading vertically-integrated supplier of powered metal components	Escape from the poor financial position	Director of mergers and acquisitions, and a manager of operations	Aerospace components	3 years

implementable terms. We secured access to the private archival data of cases A1, A2, and C. The public and private archival data both helped us triangulate the interview data and identify additional interesting issues to explore.

Data Analysis

In our data analysis, we conducted a within-case analysis followed by a cross-case analysis (Eisenhardt, 1989; Eisenhardt and Graebner, 2007). Three researchers were involved in the analysis; one was an author and the other two were research associates. Any disagreement was resolved through detailed discussions among these three researchers. Our analysis began by building case reports that triangulated all the data (Jick, 1979). We then conducted within-case analysis by mapping PAI activities and analysing their effects on acquisition performance. Based on this analysis, we developed preliminary concepts and a rough theoretical explanation for acquisition performance. Once we completed this analysis, we found clear patterns for value creation and value leakage activities across three levels of integration – high, moderate, and low – which form the basis of our cross-case analysis.

The cross-case analysis used replication logic, which is applied to our two cases for each level of integration. We first analysed value creation and value leakage over time and across functions. We then performed an in-depth analysis of the different modes of value creation and value leakage. Finally, to complete our analysis and develop a more general model, we investigated the dynamics of each functional integration strategy, its associated value creation and value leakage, and acquisition performance. We present these three steps in detail below to show how we conducted the cross-case analysis.

Step 1: analysis of value creation and value leakage over time and across functions. We started to map out the details of PAI activities within each function for all the cases, using all available interview and documentary materials.[2] Comparing the initial settings between the cases, we found that Case B was significantly larger as a deal and the case data were collected almost 10 years after the acquisition. Theoretically, a large target firm can pose challenges to PAI. However, the results of the within-case analysis for cases B and A2 indicated that the categories of these challenges were identical in both cases, because both consisted of high-level integration. Moreover, this acquisition was a strategic move and was not influenced by external factors such as industry trends or contemporary government pressures. The time delay between the acquisition and data collection does not affect our analysis. Therefore, Case B was considered suitable for analysis despite its peculiarities.

In the functional analysis, we found that acquirers generally designed PAI activities as part of the integration plan, revising them immediately after the acquisition when further information became accessible. We also discovered that the implementation of designed-in PAI activities is sequential, because some functional integration strategies are interlocked. For example, managers would know which manufacturing lines and suppliers to retain only after reorganising the product portfolio. Therefore, even though all the functional managers engaged in PAI simultaneously, the PAI activities for each function performed to redeploy resources (e.g., R&D, manufacturing, marketing, and managerial resources) emerged sequentially.

We found that these sequential PAI activities proceeded in three distinct phases: organisational integration (Phase 1), sales-oriented integration (Phase 2), and supply-oriented integration (Phase 3). The first phase comprising establishing a new organisation structure, revising the integration plan, and combining operational activities. Sales-oriented integration, the second phase, reconfigures the existing and potential products of both the acquirers and target firms and reallocates customer-related resources, such as marketing, sales, and after-sales services. Finally, the third phase, supply-oriented integration, involves the integration of suppliers and production. Therefore, in our study, functional integration strategies are not for individual functions but for combined functions.

While matching each case's PAI activities to these phases, we realised that not all the cases demonstrated activities in every phase. Cases at the same level of integration displayed similar patterns of phase coverage. We indicate the coverage of the three levels of integration based on whether the cases at each level of integration exhibited PAI activities within a phase or in a combination of phases, arranged in the following pattern:

- *A low level of integration (cases A1 and D2)*, in which the PAI contains only Phase 1;
- *A moderate level of integration (cases C and D1)*, in which the PAI comprises Phase 1 and Phase 2, or Phase 1 and Phase 3; and
- *A high level of integration (cases A2 and B)*, in which PAI encompasses all three phases – Phase 1, Phase 2 and Phase 3.

In our cases, a moderate level of integration includes only Phase 1 and Phase 2. Figure 1 presents these phases in PAI, outlining the three levels of integration and their related PAI patterns.

Step 2: analysis of value creation and value leakage modes. We focused on the value creation and value leakage associated with each acquisition activity for each case. Our investigation led us to identify and explore three major value creation constructs: asset absorption,

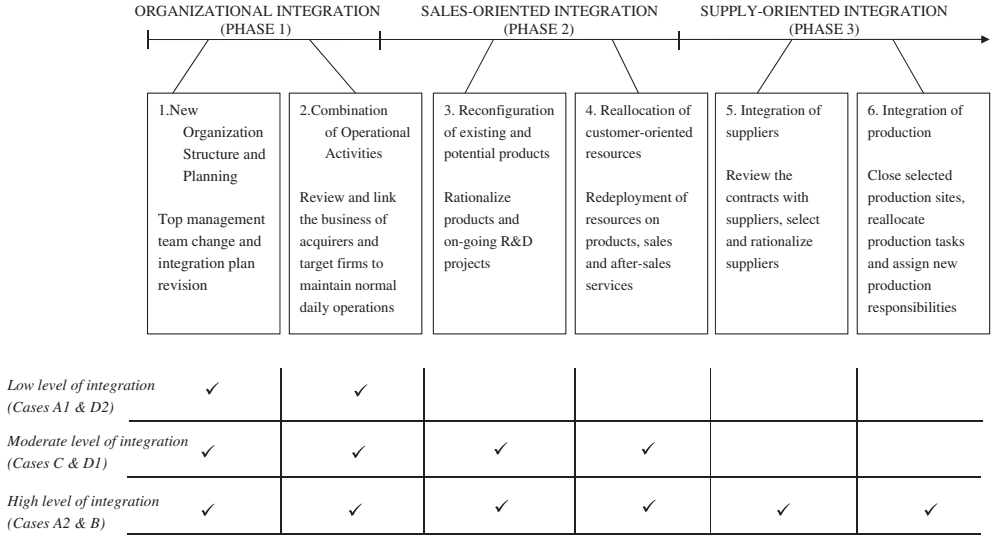

Figure 1. Three phases in post-acquisition integration

interdependence, and capability capture. Following studies such as Brueller et al. (2014), we define asset absorption as the consolidation of a target firm's market power attained by annexing and digesting its core assets. Based on this definition, asset absorption creates value in a high level of integration. Interdependence requires strengthening intra-firm ties and effective boundary spanning to create value. In a relation of interdependence, acquirers and target firms are in a symbiotic relationship, which corresponds to a moderate level of integration. Finally, the objective of the capability capture is to secure and preserve the target firm's capabilities – unique processes and key personnel. Preservation therefore occurs under conditions of low levels of integration.

Similarly, value leakage also transpires in different forms. Our analysis led us to focus on three types of value leakage: infrastructural incapacity, cross-selling failure, and subordinate relationship. We define infrastructural incapacity as a lack of capacity in the acquirer's infrastructure to support the expected integration activities in PAI. In our data, this incapacity emerges when the acquirers consolidate target firms at a high level of integration. Cross-selling failure is defined as the acquirer's inability to achieve the desired boundary expansion in both market coverage and product portfolio through cross-selling practices. A successful cross-selling strategy relies on a symbiotic relationship between acquirers and target firms at a moderate level of integration. A subordinate relationship occurs when the acquirer overestimates the degree of harmony between the two unchanged organisations in PAI and underestimates the deterioration in the former target firm's customers' attitudes towards the subordinated role of the acquired business following acquisition. This value leakage is associated with a low level of integration.

Step 3: analysis of dynamics of functional integration strategies, value creation, value leakage, and acquisition performance. To gain an understanding of the patterns and dynamics in the general case, we probed for theoretical relationships among our identified constructs (Eisenhardt, 1989; Gilbert, 2005). In our analysis, we were mindful of the possibility of better explanations and paid attention to alternative theoretical relationships and constructs (Eisenhardt, 1989). We finally developed a model consisting of three parts: the connections between the levels of integration and functional integration strategies, the routes of value creation and value leakage, and acquisition performance. In developing this model, we focused on the shifts between these parts. The general findings from our cross-case analysis are presented in Table V, which visualises our findings case by case.

We endeavoured to ensure the validity of our study (Miles and Huberman, 1994) by enhancing the reliability of our findings in terms of both process and outcome validity (Andersen and Skaates, 2004). To increase process validity, we employed abductive reasoning by alternating between the data and the literature (Dubois and Gadde, 2002). We had multiple researchers analyse the data (Strauss and Corbin, 2007) and deployed multiple sources of data and multiple levels of informants for triangulation (Yin, 2009). We present the full details on our data collection and data analysis to increase the transparency of our research process and improve outcome validity (Lincoln and Guba, 1985). To ensure the quality and validity of our insights, we encouraged in-depth descriptions from the informants and absorbed their feedback after they reviewed our case report (Yin, 2009).

Table V. General findings from the cross-case analysis

	Integration strategies			*Value creation*			*Value leakage*			*Acquisition performance*	
Case	*Absorption*	*Symbiosis*	*Preservation*	*Asset absorption*	*Interdependence*	*Capability capture*	*Infrastructural incapacity*	*Cross-selling failure*	*Subordinate relationship*	*Value gap*	*Time delay*
A1	○	○	●	○	○	●	○	○	●	●	●
A2	●	○	○	●	○	○	●	○	○	●	●
B	●	○	○	●	○	○	●	○	○	●	●
C	○	●	○	○	●	○	○	●	○	●	●
D1	○	●	○	○	●	○	○	●	○	●	●
D2	○	○	●	○	○	●	○	○	●	●	●

● = integration strategy, value creation, value leakage or acquisition performance present; ○ = no such integration strategy, value creation, value leakage or acquisition performance.

UNTANGLING THE INTEGRATION–PERFORMANCE LINK: AN INTEGRATED MODEL FROM A FUNCTIONAL ANALYSIS

In this section, we present our findings and the identified patterns along with evidence from our cases. To clarify our findings, we summarise the key terms we employed in Table VI.

Connecting Levels of Integration to Functional Integration Strategies

We argue that omitting to examine how levels of integration affect functional integration strategies prevents scholars from gaining in-depth knowledge regarding PAI. Therefore, a close inspection of the connections between the levels of integration and functional integration strategies is the first step in untangling the integration–performance link. Table VII summarises the complementary data connecting the levels of integration to their corresponding functional integration strategies. In this table, 'resource' refers to a service or other asset used to produce goods and services that meet human needs or wants.

Functional integration strategies under the high level of integration. Case A2 illustrates functional integration strategies under the high level of integration. Acquirer A's primary motivation was to possess the technology and software of Target A2 through acquisition and expand its market using the acquired software. Acquirer A viewed Target A2 as a 'very struggling company' but with a 'novel treatment plan system', according to the comments of its Director of Strategic Projects. In our data, Acquirer A perceived value only in Target

Table VI. Glossary of terms from findings

Term	*Description*
Activity	An action an acquirer takes in pursuit of its objectives for acquisition performance in PAI
Activity-based	An analysis or logic based on the PAI activity
Acquisition motive	The rationale of the acquisition from the acquirer's perspective
Capability	Power or ability to utilise resources to create value
Function	A description of the work performed to accomplish a business unit's responsibility
Integration strategy	The approaches to manipulating resources with the aim of capturing acquisition value for acquirers
Level of integration	The extent to which the target firm should be integrated into the acquirer
Organisational resources	The corporate-level resources to support the production and sales of goods and services, such as human resources and infrastructure
Resource	A service or other asset used to produce goods and services that meet human needs and wants
Sales-oriented resources	Resources directly related to developing, designing, and selling goods and services, such as those for R&D, products, marketing, sales and after-sale services
Supply-oriented resources	Resources directly related to producing goods and services, such as for suppliers, procurement, and manufacturing

Table VII. Complementary data connecting the levels of integration to functional integration strategies

Case	*Level of integration*	*Functional integration strategies (Integration)*	*Functional integration strategies (Autonomy)*	*Integration strategy*
A1	Low	***Organizational integration (Phase 1)***		Preservation
		Functional resources irrelevant to capability capture – The only intervention was to make Target A1 comply with the policies and style of Acquirer A, such as 'impose standard policies on product creation' and 'to upgrade the quality control system' – Acquirer A's Director of Strategic Projects	*Across all functional resources* – Acquirer A kept almost all of the assets of Target A2, including 'R&D personnel, brands, production sites' – Acquirer A's Director of Strategic Projects	
A2	High	***Organizational integration (Phase 1), Sales-oriented integration (Phase 2), and Supply-oriented integration (Phase 3)***		Absorption
		Across all functional resources – 'We just want to make it our cost centre. We did not see any value in some production lines. So, we sold them back to their shareholders. We didn't think there was much value in [their] brand. So, we gave up the brand from Day One' – Acquirer A's Product Director	*Functional resources directly related to the acquisition motives (R&D personnel)* – The acquisition motive was to obtain the R&D group and their patents. Acquirer A's Product Director: 'Their technical competence, particularly in developing treatment planning software, is useful to us' Acquirer A only retained the acquired R&D group	
B	High	***Organizational integration (Phase 1), Sales-oriented integration (Phase 2), and Supply-oriented integration (Phase 3)***		Absorption
		Across all functional resources – An acquired executive (Director of Global Concept Development): 'They wanted us to be part of their business. It is now fully integrated'	*Functional resources directly related to the acquisition motives (Brands)* – Target B's brands were much stronger than those of Acquirer B, and were closely related to the acquisition motive. Acquirer B kept Target B's brands because 'they started in hip [products], spine [products], trauma and sports medicine' and 'had a large geographical [market] coverage'– An acquired executive (Director of Global Concept Development)	

Table VII. *Continued*

Case	*Level of integration*	*Functional integration strategies (Integration)*	*Functional integration strategies (Autonomy)*	*Integration strategy*
C	Moderate	***Organizational integration (Phase 1), and Sales-oriented integration (Phase 2)***		Symbiosis
		Organizational and sales-oriented resources – Acquirer C had similar products to Target C, but its geographical market coverage was complementary. Acquirer C's Product Manager: 'What we are trying to do was to look at two product portfolios and identify where we want to run with those two products, where we want to run a single one and choose which one to run'	*Supply-oriented resources* – Acquirer C's Corporate Finance Director: 'We need all the production lines. We now have their factories in Switzerland and China'	
D1	Moderate	***Organizational integration (Phase 1), and Sales-oriented integration (Phase 2)***		Symbiosis
		Organizational and sales-oriented resources – 'They had safety catheters to meet our demands' but 'We continued to have a large overlap in products. They have an infusion business, which we already have' – Acquirer D's Product Manager	*Supply-oriented resources* – 'Manufacturing remained. We have made a small integration in manufacturing'. – Acquirer D's Director of Strategic Programmes	
D2	Low	***Organizational integration (Phase 1)***		Preservation
		Functional resources irrelevant to capability capture – Acquirer D's Director of Strategic Programmes: 'The only integration was to standardise the R&D development process and organisational structure'	*Across all functional resources* – 'When the engineers wanted to leave because they had to travel every day from another city, we moved the office'. – Acquirer D's R&D Manager – 'Rather than layoff staff, we recruited more sales people. The sales force increased from 10 to 100.' – An acquired Sales Manager	

A2's R&D capability.

After the acquisition, Acquirer A kept in place the R&D function of Target A2, which is the only functional resource maintained as autonomous. All the other functions were integrated; for example, the acquired brand was removed immediately after the acquisition. The acquired factory and Target A2's suppliers were divested. Acquirer A's

Operations Manager commented on the restructure as follows: 'We closed down local service operations, replaced by our service… We wanted to move products [and] manufacturing either to our headquarters in the UK or a subsidiary in Germany'.

Similarly, Case B also represents a high level of integration. Through the acquisition, Acquirer B aimed to complete its product portfolio's coverage of orthopaedic products and expand its business across the European market. Compared with Target B, Acquirer B was relatively small in the industrial sector of orthopaedics. In its PAI, Acquirer B believed that it should grant autonomy to Target B's functions related to products and markets to fulfil its acquisition motives. Acquirer B's Director of Global Concept Development, who was originally an executive in Target B, reflected as follows: 'Even though Acquirer B did the acquisition, our brand name has been kept… It is a very deliberate policy to maintain the people and the capability of our organisation'. To improve efficiency, Acquirer B rationalised resources across other functions, such as suppliers, research partners, and warehousing.

Comparing Case A2 and Case B reveals common patterns at the high level of integration. We see that, while integration activities are the norm across functions, autonomy is retained for the functional resources directly related to the acquisition motives. The acquirers and target firms become closely intertwined following the acquisition. We thus observe that the integration strategy adopted under high-level integration is quite similar to Haspeslagh and Jemison's (1991) 'absorption' strategy. However, it shares only the common features of the consolidation and dissolution of the boundary between acquirers and target firms. The absorption strategy in our study differs from Haspeslagh and Jemison's definition in one key respect – concerning the granting of autonomy to resources directly related to acquisition motives.

In formal terms, this suggests the following proposition:

> Proposition 1a: At the high level of integration, an acquirer is more likely to choose absorption as its integration strategy, extending integration across all the functions, and to choose autonomy only for functional resources directly related to the acquisition motives.

Functional integration strategies under the moderate level of integration. Case C illustrates the functional integration strategies for the moderate level of integration. The primary acquisition motivation of Acquirer C was to access the European market and strengthen its market position. Acquirer C did not expect to enrich its product portfolio through the acquisition because Target C had similar products.

Acquirer C judged that it could best create value by integrating organisational and sales-oriented resources, while letting supply-oriented resources remain autonomous. For example, Acquirer C's Director of Strategy and Business Development described the rationalisation of organisational and sales resources thus: 'Most of these [integration activities] were clearly defined cases that we would remove duplication in either the head office functions, all the back offices, sales functions and we know the costs there to take out'. By contrast, the activities for supply-oriented resources were quite different. Rather than integration, Acquirer C maintained the acquired manufacturing sites to increase its

production capacity, keeping Target C's factories in Switzerland and China. Acquirer C's Corporate Finance Director emphasised the importance of retaining the value of these sites: 'We thought the manufacturing facilities which they have were quite important to us. We need capacity, definitely'.

Case D1 is another example of a moderate level of integration. Acquirer D and Target D1 had a large overlap in their product portfolios, except for safety catheter products. However, their market coverage was complementary. As a UK firm, Acquirer D's primary market was in Europe. Target D1, a US firm, had its market strength concentrated in the USA. Acquirer D made decisions similar to Acquirer C's during PAI. It integrated organisational and sales-oriented resources but kept supply-oriented resources autonomous. For example, Acquirer D eliminated the large range of duplicated products and sales networks, which are typical sales-oriented resources: 'You are always doing acquisitions and getting some other stuff which you don't want', Acquirer D's Product Manager explained. However, regarding supply-oriented resources, Acquirer D recognised their value and decided to maintain the manufacturing capacity. The Director of Strategic Programmes candidly informed us that 'We kept the main manufacturing sites. The technology to us [is embedded in] highly automated equipment. We feel it is difficult to move these machines and a lot of investment has been put in'.

Comparing Case C and Case D1, we infer that acquirers retain the autonomous production facilities of target firms when they intend to maintain the capacity required to supply existing customers post-acquisition. At the same time, the integration of sales-oriented resources reduces duplication and improves the efficiency of product delivery to customers. We see that the degree of interdependence and collaboration between acquirers and target firms increases at the moderate level of integration. This interdependence between acquirers and target firms indicates that acquirers select a 'symbiosis' strategy (Haspeslagh and Jemison, 1991) at the moderate level of integration.

In formal terms, this suggests the following proposition:

> Proposition 1b: At the moderate level of integration, an acquirer is more likely to choose symbiosis as its integration strategy, providing integration for organisational and sales-oriented resources, and autonomy for supply-oriented resources.

Functional integration strategies under the low level of integration. Case D2 exemplifies functional integration strategies for the low level of integration. Before the acquisition, though Acquirer D's business was in the Chinese syringe pump market, it was quite small and could not compete with local competitors. By contrast, Target D2 dominated the local market before the acquisition. Acquirer D expected to dominate the Chinese syringe pump market with the hope of expanding to other emerging markets with the acquired products.

Acquirer D decided to retain almost all of the critical resources of Target D2. Doing so maximised the capability capture of resources such as R&D, marketing, sales network, manufacturing facilities, and supply networks. For example, two key acquired engineers had planned to leave because their families lived in another city; this prompted Acquirer D to relocate its R&D office to keep these key people. Although most activities remained

autonomous, Acquirer D pursued the integration of resources that were not critical to the competitive advantages of Target D2. Integration activities were limited to the organisational integration and standardising of R&D development and manufacturing processes necessary to meet the requirements of a large corporation. Acquirer D converted all product design drawings into electronic versions for future development. Acquirer D's Production Manager also noted that they introduced professional staff to the adoption of 'lean manufacturing' to improve the international image of the acquired business.

Case A1 illustrates functional integration strategies at the low level of integration. Target A1's capabilities focused on R&D and its expertise in image guided radiotherapy (IGRT) and stereotactic radiotherapy (SRT). Acquirer A was unable to develop equivalent technologies because Target A1 owned the relevant intellectual property rights. The acquisition objective was to maintain these capabilities. Therefore, Acquirer A retained most of the R&D capabilities, including R&D personnel, brands, and production sites. Since there was no overlap between Acquirer A and Target A1 on both sales- and supply-oriented resources, integration activities were limited to standardising policies on product creation and upgrading the quality of the control system, which were irrelevant to the acquired capabilities.

Comparing Case D2 and Case A1 reveals that capability capture is a main theme in PAI at the low level of integration. Any functional resource nested within the acquired capabilities is retained in an autonomous state. Integration activities centre on resources irrelevant to capability capture in order to align the firms' standards and processes. These PAI activities map onto Haspeslagh and Jemison's (1991) 'preservation' strategy, in which acquirers require high levels of autonomy and low strategic interdependence to maintain their acquired capabilities.

In formal terms, this suggests the following proposition:

> Proposition 1c: At the low level of integration, an acquirer is more likely to choose preservation as its integration strategy, extending autonomy across all functions and confine integration to the resources irrelevant to capability capture.

Understanding Value Creation and Value Leakage as Two Routes to Acquisition Performance

We propose that functional integration strategies are intended to realise value creation, but value leakage is an inevitable unwanted side effect. The compounded, or net, effect of value creation and value leakage generates acquisition performance. We thus view them as two essential routes through which functional integration strategies lead to acquisition performance. Table VIII summarizes the relevant data for each of our cases on value creation and value leakage.

Value creation and value leakage under the high level of integration. Our analysis generates two measures of value creation under the high level of integration: *reaping core resources*, and *reducing redundancies*.

In Case A2, Target A2 had a 'novel treatment plan system', which was far in advance of any product possessed by Acquirer A. The acquisition enabled Acquirer A to gain

Table VIII. Complementary data: Value creation and value leakage as two routes to acquisition performance

Case	*Integration approach*	*Value creation activities*	*Value leakage activities*	*Acquisition performance*
A1	Preservation	*Capacity capture* • *R&D capability seizing*. Acquirer A acquired the capability to develop SBRT[a] technology, which 'is very well suited to that emerging area [precisely positioning]', a fast growing market. – Acquirer A's Director of Business Development • *Market knowhow preservation*. Acquirer A's Director of Strategic Projects: 'We kept Target A1's brand going through a very long time because customers are quite happy to take products from a little company but not us. We kept their sales to support this' • *Key personnel retention*. 'Our board saw there is lots of value in senior people. They knew how strong the business is. We had retention schemes for them'. – Acquirer A's Operations Manager	*Subordinate relationship* • *Forceful integration*. Target A1's work efficiency was damaged. Acquirer A is a large corporation and has 'a matrix structure of organisation'. It is different from Target A1's flat structure, which is 'very simple product based'. 'They [employees from Target A1] are very confused and uncomfortable'. – Acquirer A's Operations Manager • *Customer hostility*. Market share declined after the acquisition. Acquirer A's Director of Strategic Projects: 'The company [Target A1] also supplied one of our competitors in the industry. They [the competitor] very aggressively worked to replace these products'	*Value gap* Acquirer A's Product Director: 'Competitors refused to buy the acquired products. So the drop in sales and profits happens quicker than we thought it would' *Time delay* Acquirer A's Operations Manager: 'They [Acquired employees] were willing to undergo the acquisition but it took a long time for them to accept their new positions'. The PAI was therefore postponed

Table VIII. *Continued*

Case	*Integration approach*	*Value creation activities*	*Value leakage activities*	*Acquisition performance*
A2	Absorption	*Asset absorption* • *Reap core resources*. Acquirer A's Product Director: 'Their technical competence, particularly in developing treatment planning software, is useful to us'. 'Our competitor already had products like that… Target A2 was to acquire and reshape into R&D only, seize them and stop manufacturing' • *Reduce redundancies*. Acquirer A sought only to gain the value of the acquired add-on products and software. 'We want it [Target A2] as quickly as possible to close down its small production facility, to close down local service operations, and to replace them by our service in Italy' – Acquirer A's Operations Manager	*Infrastructural incapacity* • *Financial constraints*. Acquirer A expected to utilise savings from consolidation over the first months to fund later integration activities. 'The problem is that the savings are often optimistic, and don't occur in the same place as the costs occur' – Acquirer A's Product Manager • *Human resource constraints*. Acquirer A's Operations Manager: 'They [Target A2] did lots of support for their product [in customer service]. They sold their product and fully respected the technical leader, to be strongly involved in the first months and then move to the next customer… We needed to put in more people and more money than we thought'	*Value gap* Acquirer A recruited 'more people' to support the acquired sales through customer service. The cost for recruitment reduced the captured value. – Acquirer A's Director of Strategic Projects *Time delay* Acquirer A's Vice President of R&D commented on the prolonged time due to an inadequate integration budget: 'We had to relocate money from elsewhere to fund the extra work. That limited the speed at which things could move'.

Table VIII. *Continued*

Case	*Integration approach*	*Value creation activities*	*Value leakage activities*	*Acquisition performance*
B	Absorption	*Asset absorption* • *Reap core resources*. Target B's complete portfolio of orthopaedic products and European market coverage were the core resources for this acquisition. In order to absorb these assets, Acquirer B 'closed only their [Acquirer B's] plants' and 'discontinued a number of their [Acquirer B's] hip [products]' – An acquired executive (Director of Global Concept Development) • *Reduce redundancies*. Acquirer B consolidated resources through all the functions with respect to the advantage of Target B. 'We did consolidations with suppliers, with research partners and other sorts of things… France and Germany maintained the warehouse, which was their [Target B] primary warehouse' – Acquirer B's Operations Manager	*Infrastructural incapacity* • *Financial constraints*. Acquirer B integrated the acquired resources across functions, which required large integration costs. 'Our integration activities were often delayed because of a huge amount of expense to add and the costs were huge' – Acquirer B's Vice President of M&As • *Human resource constraints*. Acquirer B's Product Manager: 'We are often demanding in operations in terms of quality. But, it was not so in Target B, and they were a much larger company with many manufacturing plants. We underestimated our requirements for [more] people [to help them to improve product quality]'	*Value gap* A lack of financial and human resource support rendered the acquisition incapable of fully achieving expected value. – Acquirer B's Vice President of M&As *Time delay* Acquirer B's Operations Manager: 'These kinds of changes take time… They change all the time and were still changing after five years of acquisition. We were still holding a redundant warehouse over a period of time'. The continuous changes over a long period represent the time delay in PAI

Table VIII. *Continued*

Case	*Integration approach*	*Value creation activities*	*Value leakage activities*	*Acquisition performance*
C	Symbiosis	*Interdependence* • *Boundary expansion*. Acquirer C created value through market expansion. Acquirer C's Corporate Financial Officer: 'It [Target C] fills in the gaps in our geographical coverage really well because they were much bigger in Europe, especially in some of the key countries' • *Value sharing*. Acquirer C learnt business experiences in emerging markets from Target C, who learned how to follow industry rules from Acquirer C. 'Their business in China was quite important to us because we were in the process of moving some of our products to China. Their experiences helped us to accelerate the process'. – Acquirer C's Director of Strategy & Business Development	*Cross-selling failure* • *Sales force resistance*. Before the acquisition, the two businesses had competing products, which made it difficult for the salesforce to cross-sell. 'Their [Target C] sales [staff] have been telling all the surgeons that their firm's products are better than ours. Now, suddenly, you are telling them [the surgeons] that 'you have to buy our products'. It is not easy'. – Acquirer C's Sales Manager • *Sales momentum reduction*. Acquirer C's attempts to make changes damaged motivation and could not maintain Target C's previous sales performance. 'People always like to talk about changes. But they do not want to make a change' – Acquirer C's Corporate Financial Officer • *Sales disruption*. Acquirer C's Corporate Financial Officer: 'Unfortunately, we found out that in some European countries, former Target C's business was making payments to doctors not under the guidelines in these countries – mainly Greece – but also in other parts of Europe. As soon as we discovered these payments, we stopped the payments and a lot of doctors then went elsewhere [chose products from other companies]'	*Value gap* Acquirer C's Corporate Financial Officer: 'So we stopped making any of those payments. Basically, we lost the Greek market completely and in some other European countries, and we have less resounding sales in China' *Time delay* Acquirer C dismissed the acquired employees involved in running corrupt relationships with surgeons. Acquirer C's Corporate Financial Officer: 'We had to fill in with new employees to understand the market, and all the relationships within the business'. This unanticipated recruitment delayed the market expansion

Table VIII. *Continued*

Case	*Integration approach*	*Value creation activities*	*Value leakage activities*	*Acquisition performance*
D1	Symbiosis	*Interdependence* • *Boundary expansion*. Acquirer D1 created value by acquiring the 'safety catheter business' and gaining access to the safety healthcare market from Target D1. Acquirer D's Director of Strategic Programmes: 'There was a trend to move to safety healthcare business at that time' • *Value sharing*. Utilizing acquired capabilities, Acquirer D would quickly expand to the European safety business when the European market required safety products in the future. 'We thought the European market would convert to safety quickly. We try to develop safety products for the European market with their R&D experts' – Acquirer D's Product Manager	*Cross-selling failure* • *Sales force resistance*. Acquirer D's Sales Manager: 'We also overestimated our ability to merge the commercial organisations to work as one team. They always compete with each other. We have sales in this country and they have sales in this country. We didn't work as effectively as we should have' • *Sales momentum reduction*. 'After the acquisition, we had two sales offices in France and two sales offices in Germany. We combined them. The consolidation made them not work as hard as before'. – Acquirer D's Sales Manager • *Sales disruption*. In consolidating the sales forces, Acquirer D pursued too much integration without a careful consideration of sales support. 'We shut down their main headquarter building in California, general consolidation of direct sales. But, we still have to have technical support. We had not kept enough experts in supporting selling'. –Acquirer D's Director of Strategic Programmes	*Value gap* Acquirer D faced the challenge of the departure of some of the acquired senior managers due to the sales force conflicts. 'We lost a lot of senior people in the sales. The power struggles after acquisitions can be very disruptive'. – Acquirer D's Director of Strategic Programmes. Failure to retain key people made it difficult for Acquirer D to achieve the expected acquisition value *Time delay* Acquirer D's Sales Manager: 'They always compete with each other. We have sales in this country and they have sales in this country. We didn't work effectively as we should have. They are still two separate businesses and not one business. Only after two years did they start being one business'

Table VIII. *Continued*

Case	*Integration approach*	*Value creation activities*	*Value leakage activities*	*Acquisition performance*
D2	Preservation	*Capacity capture* • *R&D capability seizing*. Acquirer D believed that it could create value by preserving the R&D capability of Target D2 in developing low-cost products. 'We really esteem the value of their capability to develop new products, albeit with low technology'. – Acquirer D's Director of Strategic Programmes • *Market knowhow preservation*. Acquirer D maintained all of the acquired distribution channels and sales force. 'Their products were very expensive and difficult to open the market with. They need our good relationships with hospitals and surgeons [who] get used to our products'. – Acquired Sales Manager • *Key personnel retention*. Acquirer D incurred huge costs to retain key R&D engineers to ensure the value of R&D capability. 'Our R&D centre has moved to another city to ensure that he [an acquired key R&D person] stays, and he was probably paid more money as well'. – Acquirer D's R&D Manager	*Subordinate relationship* • *Forceful integration*. Before selling the acquired products to other emerging markets, Acquirer D 'upgraded the products first to meet their standards and the changing national regulations'. 'It took almost five years', which delayed the planned market expansion – Acquirer D's R&D Manager • *Customer hostility*. Due to upgrades to the acquired products with respect to quality standards and regulations, 'Our previous customers tend to switch to similar products from other companies because we have not had any new products in the market for five years. Customers want new products to sell at a reasonably high price'. – Acquired Sales Manager	*Value gap* To maintain its international reputation, Acquirer D immediately stopped selling acquired products in foreign markets and upgraded their quality. 'We did not have new products in last five years. Before we had almost 70 per cent domestic market share, but now we have only 30 per cent' – Acquirer D's Director of Strategic Programmes *Time delay* Acquirer D delayed new product development, but forced the R&D group to upgrade the existing products. 'The primary task of the R&D centre is to improve product quality and save costs through redesigning the products of the last few years. We did plan to develop new products to meet the increasing customer demands, but we should upgrade these products first to meet our standards and the changing national regulations'. – Acquirer D's R&D Manager. These upgrades took almost five years, which delayed new product development

[a]Stereotactic Body Radio Therapy.

Target A2's software and related technology to upgrade their own planning system. Acquirer A's Vice President of R&D made this comment on the value of the acquired software: 'They [Target A2] had an excellent planning system… Our brand made the decision to acquire them to save our planning system'. By contrast, all the other acquired resources – such as production facilities, sales, and marketing – overlapped extensively with Acquirer A's existing resources. Acquirer A therefore shed these redundant resources through rationalisation. As Acquirer A's Product Director explained, 'We had a factory in Italy and a factory in Beijing, so we don't want the factory [of Target A2] in Italy'. Maintaining the acquired core assets generates value via the fulfilment of acquisition motives, and removing redundancies across functions creates value through cost reduction.

However, value creation at high levels of integration is costly and requires extensive support from the acquirers. Failure to cater to these costs and provide support produces value leakage. We denote this construct of value leakage as 'infrastructural incapacity'. It has two measures in our data: *financial constraints* and *human resource constraints*. Before the acquisition, Acquirer A expected unrealistically that it could obtain savings from rationalisation within the first few months and swiftly use them to finance integration activities. A Product Manager in Acquirer A was candid: 'The problem is that the savings are often optimistic, and don't occur in the same place as the costs occur'. The financial constraints delayed multiple integration activities and thus postponed value creation.

The need to increase human resources was unanticipated by Acquirer A. The case data show that the after-sales service of Target A2 was quite localized. Their technical leaders were typically closely involved with customers in the first months after sale, to provide a tailored service. After the acquisition, the market for acquired products expanded rapidly through cross-selling. With its limited technical staff, Acquirer A found it difficult to maintain tailored customer service for the enlarged market. An Operations Manager of Acquirer A reflected this challenge: 'We missed that they did a lot of local support and local helping… It was a good product but it required a lot more support than we expected'. Thus, human resource constraints prevented the planned value creation through cross-selling.

Case B shows similarities to Case A2. To create value, Acquirer B reaped the core resources of Target B to complete its product portfolio in orthopaedics and to increase its European market coverage. At the same time, it consolidated overlapping resources across all functions to save costs. First, value leakage occurred because they underestimated the high integration costs, which limited financial support and interrupted integration. Second, Acquirer B overlooked the scale of the additional human resources needed to standardise operations and marketing – for instance, to convert materials, prepare paperwork, and provide technical support. An Operations Manager in Acquirer B confirmed: 'A huge amount of work [investment] in operations has been done [in Target B] to close down a number of facilities and then bring in our standards'.

At the high level of integration, our case evidence shows that swift and comprehensive target assimilation creates value from asset absorption through reaping core resources and reducing redundancies. It also demonstrates that value leakage arises from a failure

to provide the necessary infrastructural capacity, due to financial and human resource constraints.

In formal terms, this suggests the following proposition:

> Proposition 2a: At the high level of integration, in the 'absorption' strategy, value is created from asset absorption through reaping core resources and reducing redundancies, while value leakage arises from infrastructural incapacity through financial and human resource constraints.

Value creation and value leakage under the moderate level of integration. At the moderate level of integration, the acquirer's strategy is to increase the interdependence between the two firms but to not compel them to be closely intertwined. Given this objective, two measures of value creation emerge from our data: *boundary expansion* and *value sharing*.

In Case C, value was created by enlarging the acquirer's market boundary. Acquirer C's Corporate Finance Director explained as follows: 'We actually thought the fit in Europe was excellent because their primary market was Germany, where we were not very big…We perceived revenue opportunities from cross-selling'. Value was also created through knowledge sharing. Acquirer C gained knowledge from Target C about doing business in China – a market with which it was unfamiliar. This upgraded Acquirer C's capabilities accelerated the process of '*moving some of our products to China*'. Learning was mutual. Acquirer C instructed Target C to adopt professional and ethical standards in selling its products. This meant stopping questionable payments to surgeons designed to boost sales, and thus improved the image of the acquired business.

Nonetheless, value creation via interdependence is difficult to accomplish. Our case data indicate cross-selling failure as a value leakage construct, with three measures: *sales force resistance*, *sales momentum reduction*, and *sales disruption*. In Case C, cross-selling into the expanded market was hampered by the rivalry between Acquirer C and Target C – that is, sales force resistance. The acquired sales force felt awkward and resisted the obligation to sell the products of a former leading competitor, Acquirer C.

Sales momentum was reduced because Acquirer C failed to manage informal discussions and hearsay appropriately among employees. Even though the acquired employees were receptive to the changed circumstances when the PAI began, rumours bred antagonistic attitudes to integration among the acquired employees. Sales force momentum slowed considerably due to demotivation and a lack of stable product supply. Sales were also disrupted due to unexpected compliance problems. Acquirer C discovered that Target C was making ethically questionable or illicit purchase incentive payments to surgeons within Target C's territories. Considering this practice incompatible with its international reputation, Acquirer C insisted that the payments cease. This led immediately to the loss of most of the acquired market in Europe.

A similar outcome appears in Case D1. Acquirer D's Director of Strategic Programmes described the importance of boundary expansion as follows: 'The reason for us to buy them is that we have a small-but fast growing-need for [a] safety business'. Before the acquisition, Acquirer D predicted that the European market would soon migrate towards safety products and would grow rapidly. The acquirer expected that value sharing

between the two firms would promote the development of safety catheters and help the unified business expand rapidly within Europe. However, as in Case C, the three measures of cross-selling failure appeared in Case D1, leading to value leakage. Acquirer D's Director of Strategic Programmes identified a fundamental problem, 'They [the distributors] refused to sell competitors' products'. This happened because Acquirer D had been Target D1's competitor before the acquisition. Sales force momentum was lost for a period and, contrary to Acquirer D's expectations, the projected growth in safety product demand within Europe stalled and experienced significant delays.

Our comparative analysis suggests that interdependence between acquirers and target firms creates value through boundary expansion and value sharing at the moderate level of integration. After the acquisition, however, the two firms find it difficult to work together effectively due to cross-selling failure with respect to sales force resistance, sales momentum reduction, and sales disruption.

In formal terms, this finding suggests the following proposition:

> Proposition 2b: At the moderate level of integration, in the 'symbiosis' strategy, value is created from interdependence through boundary expansion and value sharing, while value leakage arises from cross-selling failure through sales force resistance, sales momentum reduction, and sales disruption.

Value creation and value leakage under the low level of integration. At the low level of integration, value creation is pursued by capturing the capabilities embedded in target firms. In our study, three measures of value creation for capability capture emerge from our data: *R&D capability seizing*, *market know-how preservation*, and *key personnel retention*.

In Case D2, value was created by absorbing the acquired products and market relationships, while retaining the capabilities embodied within key personnel, which are essential to serving a growing number of emerging markets. To maintain R&D capability, Acquirer D moved its R&D centre to another city to meet the wishes of key acquired staff, to retain them, and to be better able to recruit new R&D staff and strengthen the team. Five years after the acquisition, the Human Resources Manager of Acquirer D observed, 'It [the R&D centre] has fifty people now'. Moreover, the Director of Strategic Programmes concluded that the retention and extension of sales capabilities had helped Acquirer D to '*sell in two hundred countries*' and triple its market capacity.

We found that, even when integration activities are minimal, this does not guarantee the fulfilment of expected value creation. Value leakage arose from the subordinated relationships of our target firms with respect to acquirers. Two measures emerged from our data: *forceful integration* and *customer hostility*. Despite granting a high level of autonomy to the acquired business, Acquirer D – as a global leader – was unable to tolerate that Target D2 – a small private firm – lacked a professional product development process. The standardising of the acquired R&D process was not expected before the acquisition, and took almost five years to complete. New product development was postponed due to this long standardisation period. Acquirer D's R&D Manager explained: 'We did plan to develop new products to meet the increasing customer demands, but we should upgrade their product development process first to meet our standards'. This protracted

standardisation impacted sales by preventing the original R&D team of Target D2 from continuing to supply new products to the market. As a result, Target D2's customers switched to other firms. A Sales Manager of Target D2 complained, 'Every time when customers asked whether we have new products, I had to say 'No'… Now, we only have thirty percent of domestic market share. Before, we had seventy percent'.

There are similarities between cases A1 and D2. Acquirer A did not plan to integrate the assets of Target A1, as Acquirer A's Product Director explained: 'When we acquired them, we kept them independent. There wasn't any closing of duplicate functions'. Acquirer A also made efforts to retain key people. As Acquirer A's Director of Business Development recounted, 'Our board saw the value in senior people. They knew how strong the business is. We had retention schemes for them'. However, the acquirer could see that key senior staff could not get used to their new subordinate roles. As a result, acquired capabilities were subsequently lost. A Product Manager of Acquirer A gave this justification: 'He [the acquired research director] had some ideas to work for us, but we thought it was not appropriate because it's not our way of doing things'. The acquired research director soon left after the acquisition. Moreover, the target firm was a supplier of a large customer in competition with Acquirer A. The competitor did not trust the assurances made by Acquirer A that it would maintain the supply of the products it needed, so it swiftly switched to other suppliers.

Our cases show that acquirers aim to capture capability through acquired R&D capability, market knowhow, and key acquired talent. Nevertheless, after the acquisition, though the acquirers may profess support for the autonomy and independence of the target firms, forceful integration and customer hostility are liable to result in a subordinate relationship as the value leakage construct.

In formal terms, this suggests the following proposition:

> Proposition 2c: At the low level of integration, in the 'preservation' strategy, value is created from capability capture through R&D capability seizing, market know-how preservation, and key personal retention, while value leakage arises from subordinate relationships through forceful integration and customer hostility.

Rethinking Acquisition Performance: Value Gap and Time Delay

Our study shows that each case experiences value leakage, through which the acquirers cannot achieve the expected acquisition performance. Our investigation provides a fresh and more detailed view of acquisition performance. A better informed understanding of acquisition performance could help improve acquirers' opportunities to fulfil their acquisition objectives. In responses to our interview questions on acquisition performance evaluation, two constructs of acquisition performance emerged from our case data: value gap and time delay. Value gap is the difference between the pre-acquisition expected value and the actual value obtained during PAI by employing each functional integration strategy. Time delay gauges the extent to which the acquirers gained the expected value from the acquisition, but outside the expected time frame set for each functional integration strategy.

We use Case A2 to illustrate these two constructs. Before the acquisition, Target A2 supplied products to Acquirer A's competitors. Though Acquirer A gave assurances that it would maintain supply to its competitors after the acquisition, these competitors did not trust A's promise. Acquirer A's Product Manager reflected, 'They [the competitors] worked aggressively to replace our [acquired] products'. Therefore, Acquirer A gained much less value than expected from the acquired products. Additionally, Acquirer A and Target A2 operated under differing regulations on the sale of acquired products, as they originated from different countries. During PAI, Acquirer A had to invest in training people to conduct internal and external auditing, involving many months' work and giving rise to an unexpected delay of six to nine months. A Vice President of Acquirer A reflected on this prolongation of time, which was a result of inadequate integration budgets: 'We had to relocate money from elsewhere to fund the extra work. That limited the speed at which things could move'. Table VIII provides further illustrations drawn from other cases.

Our analysis sets out new measures in assessing acquisition performance. We find that we can measure acquisition performance by evaluating whether, and the extent to which, the acquirers fulfilled their acquisition objectives within the expected timeframe (i.e., value gap and time delay).

In formal terms, this finding suggests:

> Proposition 3: Acquisition performance is qualitatively measured through the value gap and time delay from the perspective of the acquirer

Towards an Integrated Model of Untangling the Integration–Performance Link

Our study investigates the intermediating mechanism of the integration–performance link in PAI. Previous research acknowledges the importance of a function-specific mechanism for exploring the mediating dynamics between integration strategy and acquisition performance (e.g., Graebner, 2004; Paruchuri et al., 2006; Schweizer, 2005; Teerikangas and Thanos, 2018). However, the connections between each functional integration strategy and its associated value creation and value leakage have remained obscure; nevertheless, they are critical to understanding the integration–performance link.

Starting with the level of integration, which represents the extent of the target firm integrated into the acquirer, we seek to untangle the integration–performance link. We explore three levels of integration – high, moderate, and low – as a means of drawing out the functional integration strategies. Taking a dynamic perspective, we find that integration and autonomy decisions about each functional resource vary over time rather than being fixed as a once-and-for-all decision in PAI. Tracing through the PAI timeline, three phases (see Figure 1) emerged from our cases: organizational integration (Phase 1), sales-oriented integration (Phase 2), and supply-oriented integration (Phase 3). We find that each phase emphasised the integration of some specific functional resources, leaving the other functional resources unchanged. If PAI has more than one phase, some functional resources that are autonomous in Phase 1 may be integrated in later phases. In

our findings, each level of integration corresponds to different phase combinations: Low (Phase 1), moderate (Phase 1 and Phase 2, or Phase 1 and Phase 3[3]), and high (Phase 1, Phase 2, and Phase 3).

We identify the integration strategy for each level of integration, with the functional integration strategies specifying the decisions applicable to each functional resource (*Propositions 1a, 1b, and 1c*). For example, the integration strategy for the high level of integration is absorption, extending integration across all functions. In this instance, autonomy is adopted only for the functional resources directly related to the acquisition motives. Shifting the analysis to a functional level allows us to explore distinct constructs of value creation and value leakage linked to each functional integration strategy, according to these three levels of integration (*Propositions 2a, 2b, and 2c*). In qualitatively assessing acquisition performance, our study finds two constructs of acquisition performance: value gap and time delay (*Proposition 3*). Connecting these propositions, we present our findings in an integrated model (see Figure 2). This integrated model sets out the underlying intermediating mechanism within the integration–performance link and suggests both theoretical and empirical research implications.

DISCUSSION

We began this study by noting earlier research suggesting the importance of function-specific mechanisms for explaining the mediating dynamics between integration strategy and acquisition performance (e.g., Graebner, 2004; Paruchuri et al., 2006; Schweizer, 2005). Even though a recent study examined the effect of symbiotic integration strategy on acquisition performance (Teerikangas and Thanos, 2018), the underlying mechanism explaining the effects of integration strategy on acquisition performance remained unknown. To address this gap, we have explored how the level of integration affects acquisition performance from the acquirer's perspective. Our theoretical contribution is our functional analysis of the integration–performance link.

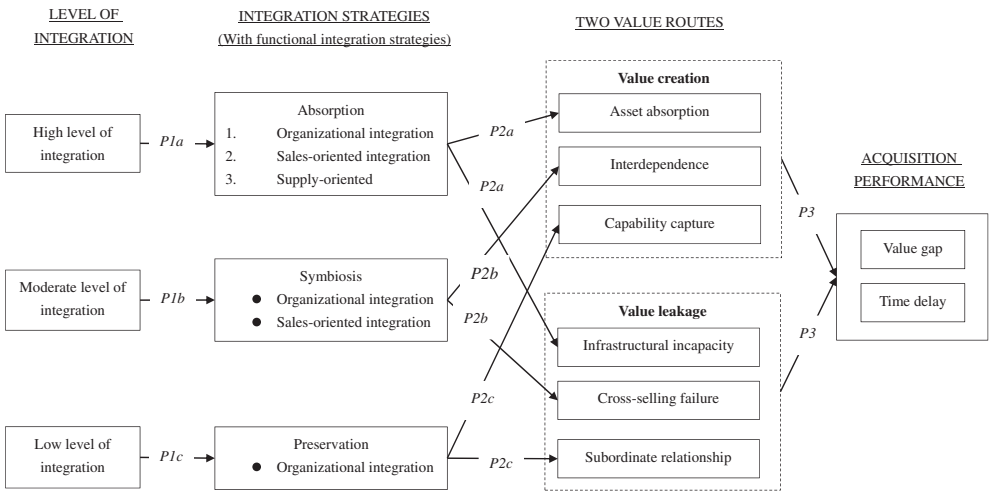

Figure 2. Untangling the integration-performance link: An integrated model

Towards a Functional Analysis of the Integration–Performance Link

Our key theoretical contribution is untangling the integration–performance link in the context of acquisitions through a functional analysis. The literature recognizes that a functional analysis can help reveal the mediating dynamics in PAI (Bauer and Matzler, 2014; Håkanson, 1995; Lindgren, 1982; Oberg, 2008). Studies have explored the roles of individuals (e.g., Graebner, 2004; Paruchuri et al., 2006; Teerikangas et al., 2011) and intermediating mechanisms (e.g., Kretschmer and Puranam, 2008; Puranam et al., 2009; Schweizer, 2005) in order to understand the integration–performance link.

The functional mediators of acquisition performance have been identified in the recent work of Teerikangas and Thanos (2018). However, this latest work remains silent on the path from level of integration to acquisition performance. Taking a functional analysis, our study fills in this research gap with six in-depth case studies. The intermediating mechanism that we identify connects levels of integration, functional integration strategies, value creation and value leakage, and acquisition performance. In our study, functional integration strategies are not for individual functions but for combined functions. Drawing on this developed intermediating mechanism in the integration–performance link, we explain our theoretical contribution in three parts.

Implications for integration strategy in PAI. Our first theoretical contribution is connecting the levels of integration to functional integration strategies. 'Level of integration' and 'integration strategy' are generally viewed as alternative concepts (Teerikangas and Joseph, 2012). Our study is among the first to clarify these two concepts and identify their relationships. Based on prior studies, we consider level of integration as the extent to which the target firm is integrated into the acquirer (Cording et al., 2008; King et al., 2004; Teerikangas and Joseph, 2012). We also define integration strategy as the approach taken to manage resources with the aim of capturing value for acquirers (King et al., 2008).

We argue that level of integration is more about the extent of the changes between an acquirer and a target firm across functions, while integration strategy involves the details of the changes within PAI made to create value for the acquirer. In this distinction, level of integration is conceptual and concerns how the two firms are integrated post-acquisition; thus, it determines the integration strategy developed for value creation. In PAI, integration strategy is implemented via functional integration strategies intended to achieve acquisition performance (Gates and Very, 2003). By identifying the connections between levels of integration and functional integration strategies, we drive the analysis down to the functional level.

Our study seeks to reconcile the complex effects of integration strategies on acquisition performance by introducing the time dimension. Quantitative studies treat integration and autonomy as conflicting needs and argue about which, or what combination of the two, is more value-creative in PAI (e.g., Puranam et al., 2009; Puranam et al., 2006; Zaheer et al., 2011). Qualitative studies explore the typology of integration strategies and investigate the effects of each integration strategy on acquisition performance (e.g., Haspeslagh and Jemison, 1991; Nahavandi and Malekzadeh, 1988). The two groups

of studies both find that integration strategies have mixed effects on acquisition performance (Faulkner et al., 2012).

We trace the connections between levels of integration and functional integration strategies, and come to a different conclusion. Our study finds that these mixed effects arise because existing literature neglects the dynamics of functional integration strategies within PAI. Rather than being a fixed strategy, integration activities vary over time with respect to each functional resource. To create value, a functional resource, even if kept autonomous when PAI begins, may be integrated at a later stage. Therefore, concluding which integration strategies positively or negatively affect acquisition performance is an arbitrary process. The effects of functional integration strategies on acquisition performance cannot be untangled without considering this time dimension. The key is recognising that the dynamics of functional integration strategies operate across three PAI phases under each level of integration.

Implications of value creation and value leakage as intermediating mechanism. Our second contribution is proposing that the route from functional integration strategies to acquisition performance lies through value creation and value leakage. Prior research recognizes the importance of value creation and value leakage in acquisition performance (Graebner et al., 2017; Meyer, 2008; Teerikangas et al., 2011). However, the constructs of value creation and value leakage remain obscure, with only a few identified in the literature to date (e.g., Buono and Bowditch, 1989; Eckbo, 1983; Haugen and Langetieg, 1975; Kim and McConnell, 1977; Meyer, 2008; Seth, 1990).

Our findings identify which of the three known constructs – asset absorption, interdependence, and capability capture – is most active within the three levels of integration and connect the conditions in which these constructs emerge with functional integration strategies. This extends recent work on the functional mediating dynamics in PAI by Teerikangas and Thanos (2018). For example, we find that, within the preservation strategy, capability capture appears to create the most value at the low level of integration. We also identify specific functional integration strategies for the preservation strategy. In our study, we suggest how functional integration strategies link to value creation for each level of integration. Our findings also identify several measures of each value creation construct arising from our cases. These measures might be harnessed to develop operational measures in order to better understand value creation quantitatively. For example, three measures of capability capture – R&D capability seizing, market know-how preservation, and key personal retention – can be operationalized for quantitative research.

Correspondingly, we ground the identification of value leakage in relation to functional integration strategies under each level of integration. Three constructs of value leakage emerge from our cases: infrastructural incapacity, cross-selling failure, and subordinate relationship. For example, for the absorption strategy, functional integration strategies extend integration across all the functions, with autonomy maintained only for those functional resources directly related to the acquisition motives. In this way, functional integration strategies are connected with infrastructural incapacity, which is the value leakage construct under the high level of integration. In addition to furthering our understanding of value creation, we identify specific measures for each construct of value leakage under three levels of integration. These constructs and measures may also

be useful as a basis for future quantitative research conducted to further our understanding of the intermediating mechanism within the integration–performance link.

Implications for rethinking acquisition performance. Our third contribution is showing how a functional analysis can lead to a rethinking of the qualitative measures of acquisition performance. In qualitative studies, measures commonly take the form of managers' assessments of acquisition success (Graebner, 2004), such as objective achievement (Angwin, 2004; Datta, 1991), comparison with main competitors (Child et al., 2001/2003), expert financial press commentary (Datta and Grant, 1990), multiple respondents' assessments (Bowman and Ambrosini, 1997), and narratives of success (Vaara, 2002). We challenge these measures by arguing that general subjective assessments cannot provide a comprehensive understanding of acquisition performance. Prior studies conflate different causes, making their functional analyses less likely to deliver insights.

It has been argued that measures of acquisition performance should align with the theoretical dimensions of the phenomenon under investigation (Cording et al., 2010). Our study investigates acquisition performance on the basis of the effects of value leakage on expected value creation. Based on our informants' testimony, two constructs emerge for the qualitative measurement of acquisition performance: value gap and time delay. Value gap is the failure to attain the expected value from each functional resource, and time delay is the prolongation of the time required to achieve the expected functional value. Identifying value gap and time delay within a functional qualitative assessment of acquisition performance yields high clarity, and offers a deeper understanding of acquisition performance. We also posit an empirical relationship between value gap and time delay. Though these two constructs are conceptually independent, time delay may result in a loss of value, as it can damage the momentum of the fulfilment of acquisition objectives.

Our newly identified construct of time delay may have implications for understanding, and possibly resolving, the conflicting empirical findings on the relationship between integration speed and acquisition performance. The literature generally agrees that integration speed affects acquisition performance (Bauer and Matzler, 2014; Teerikangas and Joseph, 2012; Teerikangas and Thanos, 2018), but views about whether the effect is positive or negative diverge (Epstein, 2004; Ranft and Lord, 2002). Our reasoning suggests that there can be no absolute verdict on whether high or low integration speed positively (or negatively) affects acquisition performance. Rather, it is the time delay for a specific integration activity that negatively affects acquisition performance. Thus, it is not speed but rather delay that, by increasing value leakage, determines acquisition performance.

Limitations and Future Research

Our study has several limitations, which offer avenues for future research. We minimized retrospective bias by employing multiple data sources and triangulation. Nevertheless, this bias may remain due to the time lag between the data collection and the PAI under study. Retrospective bias might generate unreliable data and introduce alternative explanations into the data analysis, thus reducing validity and limiting the generalizability of

our findings. Future research could reduce the scope for retrospective bias by investigating cases immediately after acquisition and by tracing the PAI process more promptly.

Given that our cases are confined to the medical technology industry, we observe PAI practices only within our chosen technology-intensive and rapidly-changing industry. The limitations of narrowing our case research to this one industry are reflected in the restriction on our empirical evidence. We observed only one type of moderate level of integration, containing only organizational integration (Phase 1) and sales-oriented integration (Phase 2). We recognize that, in a different industry such as a manufacturing-intensive industry, the moderate level of integration might comprise only organizational integration (Phase 1) and supply-oriented integration (Phase 3). In other industries, the acquirers may sometimes adopt the three phases simultaneously. This would differ from the sequential acquisition phases we observed in the medical technology industry.

Apart from the integration phase, our findings on the intermediating mechanism within the integration-performance link may also differ in other industry contexts. For example, in a mature and stable industry, where acquisitions are typically cost driven (because of slow market growth), the value creation and value leakage constructs might differ from those identified in our study. Thus, future research should replicate and extend our research in other industrial contexts. We also chose to restrict the acquirers in our sample to UK-/US-based firms in order to concentrate on extracting in-depth knowledge from the cross-case analysis. Acquirers from the UK and the USA are reported to share PAI aggressiveness (Faulkner et al., 2003). Our findings might therefore change if the acquirers were disposed to be mild in integrating the target firms.

Our data collection follows our research focus – on the capturing of value from the acquirer's perspective. Omitting the view of target firms means that we cannot claim a holistic investigation of integration strategies. For example, research suggests that UK/US acquirers are disposed to enthusiasm or eagerness in integrating target firms (Child et al., 2001/2003). Thus, even when pursuing an autonomy strategy, UK/US acquirers are said to be typically inclined to force the acquired businesses to conform to the acquirers' policies and rules. The target firms then experience a pressure exerted by a sense of the acquirers' superiority (Child et al., 2001/2003). In these circumstances, informants in target firms may view autonomy as an integration strategy. Accordingly, our findings may partly contradict observations where researchers have data on both acquirers and target firms.

In the data analysis, though our cases are all cross-border acquisitions, we did not specifically analyse the effects of national culture, as we found no prima facie evidence that national culture differences affected the findings from our data. However, differences in national culture between acquirers and target firms may well affect PAI and acquisition performance (Teerinkangas and Irrmann, 2016). Our findings may be strengthened or partly contradicted by future research that considers differences of national culture in cross-border acquisitions in other cases or contexts. We should note that we did not investigate the effects of target firm ownership and size. The contrast in ownership between public and private and in the size of the target firms will affect the complexity of the organizational cultural encounters during PAI (Stahl and Voigt, 2008; Teerikangas and Very, 2012). Thus, a more complete consideration of the research setting will enable future studies to gain a deeper understanding of the integration–performance link in PAI.

Future research can also refine or strengthen our findings in a variety of ways. First, more work can be done to investigate further levels of integration and their connections with functional integration strategies. The three levels of integration considered in our study are taken as examples drawn from the spectrum of the levels of integration (Child et al., 2001/2003). Further refinement would suggest an exploration of the integration–performance link for gradations in the level of integration, from lowest to highest. Each of these fine-tuned levels of integration might reveal functional integration strategies with varying proportions of integration and autonomy applied to each functional resource. Second, further research should investigate the interrelationship between value gap and time delay. In our study, we infer that the longer the PAI time delay, the greater the value gap. Our conjecture about this positive relationship requires further research.

Managerial Implications

Our findings may help acquirers to better achieve expected value in PAI. We suggest that acquirers should start with a view of the appropriate level of integration before engaging in and managing PAI. This desired level of integration can be determined from information obtained through due diligence and then adjusted in the light of new or revised information after acquisition. Then, given the chosen level of integration and through a functional analysis, the acquirer's integration managers should decide whether to integrate each functional resource or keep it autonomous. Though this integration or autonomy decision may be made within a short period after acquisition, action should be taken sequentially to ensure their effectiveness.

During implementation, the acquirer's integration managers should be aware of the constructs of value creation and value leakage. They should pay attention to potential value leakage. The acquirers' integration managers should be apprised of the value creation and value leakage in each functional integration strategy. In making their final assessment, acquirers may benefit from our two constructs for measuring acquisition performance: value gap and time delay. Our study may thus improve PAI management and help acquirers to achieve the expected acquisition performance.

CONCLUSION

The management challenge of achieving the expected value for acquirers in PAI is a perennial problem, both in the academic domain and in management practice. The research has acknowledged the utility of exploring the functional mediating dynamics as a way of resolving this problem. However, the complex nature of PAI requires a deep understanding of the intermediating mechanism underlying the integration–performance link. Taking a functional analysis, we investigate the integration–performance link by tracing out the connections between each functional integration strategy and its associated value creation and value leakage. The chosen level of integration the acquirer determines and plans for at the beginning of PAI is intimately connected to functional integration strategies. Acquirers inevitably experience value leakage when implementing these functional integration strategies to realize expected value, which impedes value creation. Our innovation is in identifying three constructs of value creation, together with

the corresponding constructs of value leakage, specific to the contexts of high, moderate, and low levels of integration. Finally, we have proposed two potentially useful constructs with which to qualitatively measure acquisition performance: value gap and time delay. Future research can build on our investigation of the integration–performance link using a functional analysis and explore the intermediating mechanism more deeply and in all its aspects.

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NOTES

[1] This is also referred to as the 'degree of integration' (Bauer and Matzler, 2014; Shrivastava, 1986; Teerikangas and Joseph, 2012).
[2] Details on the acquisition process for each case are available from the corresponding author upon request.
[3] This combination is not evident in our cases, but we infer it from other industries, such as manufacturing-intensive industries.

APPENDIX

Part 1: General Information

1. Over the last 5 years, for the mergers and acquisitions you have experienced, which one has brought the most value to your company, and why?
2. Could you please explain your role a) before the M&A and b) during the integration?

The questions below are based on a particular case.

Part 2: Pre-deal considerations

1. **Motives**: What was the primary motive for the M&A in terms of value to the business? What were the offerings of your company to the targets?
2. **Environment**: Was there any M&A trend in the area at that moment? Was there any government issue involved?
3. **Synergies**: What were the various sources of synergy or value creation brought about by the M&A (Expected vs. Achieved)?
4. **Target selection**: Were there any other potential targets at that moment? If so, why not choose others? Could this target meet all of the primary motives for the acquisition?
5. **Target attributes**: What stage was the target in at that moment (Proof of concept, POC in human being, Reimbursement, CE Approval/US Approval or CE 1st revenue/US 1st revenue)? Did the stage at which the target was involved affect the acquisition price, and how?
6. **Target strategy**: What were the benefits to the target through this acquisition? Did the target attract other bidders to increase the price?

7. **Transaction**: What did you use for acquisition, cash or stock? What was the calculation method (DCF or combination of current revenue, cash flow, net worth, or operating assets)?

Part 3: Post-deal considerations

Questions for 'R&D/Design', 'Procurement', 'Production', 'Marketing/Sales', 'Distribution', and 'After Sales Services'

1. **Comparisons**: What were the similarities and differences between the two firms in ** before the deal?
2. **Integration process**: What did integration of the ** area involve, and what were the key integration activities? (Please describe this approach in terms of the key activities, phases and timescales for each function).
3. **Integration strategy**: How do you determine the priority of each activity (the sequence)?
4. **Evaluation**: How did you evaluate synergies for this function? How did evaluation affect the integration process (the integration process might be changed because of the evaluation results)?
5. **Problems**: What were the difficulties experienced during integration of the ** area?
6. **Tools & Skills**: What tools or skills are related, if any?

Integration in General

1. **Influencing factors**: What were the internal factors affecting achieving synergies (e.g., whether a company has resources, regulatory approval, venture funding, and the chronology of the deal)? What were the external factors affecting the achievement of synergies (e.g., diversification of assets, manager hubris, or empire building by managers)?
2. **Quick wins**: What were the quick wins and how were they realized? (A quick win is something easy to achieve).
3. **Longer-Term Benefits**: What were the longer-term benefits, and what steps were required in the early stages of the integration to ensure that these benefits would be realized?
4. **Functional Effect**: Which business functions were most affected by the integration and why?
5. **Interaction**: What were the interactions of functions/network in the integration? What are the effects of one function/network on others in terms of integration? (Networks include procurement, production, distribution and sales).
6. **IT System**: What changes resulted from the integration and when did they occur?
7. **HR**: What changes resulted from the integration and when did they occur (Key staff/ people/ training/ reporting system/ Culture)?

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