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Human Capital, Shared Expertise, and the Likelihood of Impasse in Corporate Acquisitions†

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Human capital often cannot be acquired in efficient labor markets due to poor information or firm-specific skills that develop over time. Since such knowledge may be critical to firms building a strategic capability, it is not surprising that many acquisitions occur in human capital-intensive industries. Yet, the uncertainty associated with human capital increases the risk of overbidding. If the buyer bids conservatively, the target may reject the offer or rival bidders may emerge. In contrast, aggressive bidders may need to back out of the transaction if due diligence reveals unanticipated risks. Either way, impasse is more likely for targets in human capital-intensive industries. This study explores whether a shared expertise mitigates these hazards. Findings suggest that similar expertise is particularly important when acquiring human capital-intensive targets. Transactions involving unrelated buyers of such targets are less likely to close. This has implications for diversification theory and the resource-based view. © 2002 Elsevier Science Inc. All rights reserved.

It has never been easier for talented people to walk away, leaving the acquired company an empty shell. And the cultural problems of blending personnel can be daunting. Yet, the reasons companies put up with the risks, uncertainties, and expense of buying companies for the human talent of the target point to powerful underlying forces . . . Building work teams from scratch can be yesterday's luxury (Wall Street Journal, 1997).

Knowledge is one of the most promising sources of a sustainable advantage and is therefore a logical focus in acquisitions (Barney, 1991; Itami, 1987; Prahalad & Hamel, 1990). Human capital, in turn, is critical since knowledge is created by transforming human capital into group- or firm-level knowledge (Nonaka, 1994). Accordingly, buyers may choose

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acquisitions because they seek complementary assets such as intact teams (Chi, 1994). Thus, it is not surprising that many acquisitions take place in human capital-intensive industries such as business services, real estate brokerage, software, and health services (*Mergers & Acquisitions Journal*, 2000).

However, human capital poses serious hazards in corporate acquisitions. Most studies of knowledge and acquisitions focus on post-acquisition integration (Buono & Bowditch, 1989; Haspeslagh & Jemison, 1991). As the quote illustrates, turnover may eliminate the target's core assets once the firm is purchased. However, it is also clear that such problems plague the acquisition process itself. At a minimum, buyers face a risk of overpaying when the target is hard to evaluate since they must rely on the target for critical information (Giammarino & Heinkel, 1986).

Part of the problem may revolve around whether the buyer and the target share common industry expertise—buyers with similar expertise may be more adept at evaluating a knowledge-intensive target. Coff (1999) found that, when purchasing targets in knowledge-intensive industries, buyers with related industry expertise structure transactions differently from those that lack shared expertise.

This could either mean that related and unrelated buyers face different hazards or that they have different acquisition objectives. Unfortunately, like almost all studies of mergers and acquisitions, Coff (1999) only focused on buyers who felt that they had overcome the most serious hazards—when targets successfully resisted the takeover attempt or buyers backed out, the cases were excluded. If unrelated buyers of human capital-intensive firms face more serious hazards, we might anticipate a greater likelihood of impasse. These cases have been dropped in virtually all other published research on corporate acquisitions.

Accordingly, this study examines whether human capital and shared expertise predict whether proposed acquisitions will actually close. This enhances our understanding of knowledge-based acquisition strategies which may be at the core of building a resource-based advantage. The next two sections develop a model that explores how human capital intensity and related expertise may interact to hinder some transactions while promoting others. I then test the model using a sample of attempted acquisitions. This is followed by discussion and implications for further work.

Industry Human Capital and Uncertainty in Acquisitions

Human Capital, Knowledge and Skills

Human capital refers to knowledge that is embodied in people. As such, the human capital and knowledge literatures are linked. Human capital is explored in the economics literature, while the knowledge literature draws primarily from sociology. A more critical distinction is that knowledge may be codified and stored using books, information technology, or routines (Polanyi, 1966). In contrast, human capital refers only to knowledge embodied in people (Becker, 1983). In this sense, human capital is a subset of the phenomena referred to in the knowledge literature. Education and training are the most widely accepted measures of human capital (Becker, 1983; Mincer, 1974).

Human Capital and Uncertainty about the Target's Value

In general, human capital poses information dilemmas in market transactions. Firms often hoard human capital or rely on cryptic signals in order to avoid the hazards of labor markets (Chang & Wang, 1996; Chiang & Chiang, 1990; Spence, 1973). This differs from unskilled labor which is often considered to be a commodity that can be attained efficiently in spot markets.

These information problems may also extend to human capital-intensive firms. While physical assets are adequately measured in financial statements, human capital is systematically excluded (Flamholtz & Coff, 1994). It is almost as if balance sheets are provided for some industries but not others (since the primary assets are systematically excluded). Thus, for human capital-intensive firms, publicly available financial information is less useful.

Like other strategic factor markets, rents may accrue to the buyer if they have different expectations of the asset's value (Barney, 1986). As a general rule, buyers are more optimistic about the target than are target owners. That is, they feel that the target will ultimately be worth more than the purchase price. The extent to which a buyer is correct in these expectations depends on their estimates of the target's stand-alone value and the value created through synergistic gains. While the relative importance of these elements depends on the buyer's objectives, human capital is a source of uncertainty regardless of how the buyer intends to create value.

Uncertain stand-alone value. First, uncertainty translates into cash flows as turnover is factored into the target's stand-alone value. While one can know whether tangible assets will be transferred, human capital is much less certain. This turnover effect is linked to the stand-alone or going concern value of the target. That is, even if the buyer does not intend to generate synergy or integrate the two firms, turnover may reduce the target's value to the buyer.

Although most employees can be replaced, the cost of replacement can be significant and may affect projected income and, accordingly, the target's value. When America Online acquired Netscape, turnover delayed the scheduled release of Netscape's browser by 2 years. The fact that buyers are aware of this problem may grant substantial bargaining power to target management in negotiations. For example, when IBM acquired Lotus Corporation, the creator of Lotus Notes, Raymond Ozzie, threatened to quit unless IBM retained the CEO of Lotus (Wall Street Journal, 1995). IBM finally relented, recognizing that Ozzie was a critical link in the chain of capabilities that IBM wanted to acquire.

Although the buyer's objective is important, turnover introduces some uncertainty into acquisitions of human capital-intensive targets regardless of what the buyer plans to do. Even if the buyer's objective involves discipline, turnover may pose a serious dilemma. In this case, although some turnover may be desired in order to change a poorly performing target's strategic direction, this is typically limited to the top management team (Jensen, 1988; Walsh & Kosnik, 1993). Significant turnover beyond this in a human capital-intensive target implies a loss of critical capabilities even if the firm has performed poorly. As the IBM/Lotus example illustrates, it is often hard to replace top management without losing other key individuals. In fact, recent studies question whether replacing the CEO in poorly

performing targets improves subsequent performance (Cannella & Hambrick, 1993; Walsh & Ellwood, 1991; Walsh & Kosnik, 1993).

Uncertain synergy. The prospect of synergy may inject even more uncertainty into estimates of the target's value. In addition to the risk of turnover, the buyer must be concerned with how the resources will complement each other once they are combined. This translates into uncertain cash flows since the combined capabilities cannot be observed *a priori* in assessing synergy. The value created depends on the strategic and organizational fit of the two firms rather than on their individual resource profiles (Haspeslagh & Jemison, 1991).

Synergies may arise from sharing or transferring a range of different resources (financial, physical, human, etc.). While estimating synergy might pose difficulties in many acquisitions, it may be relatively easier for physical assets than for human capital. In the case of tangible assets, it may be as simple as checking whether a machine is tooled in metric or English increments. This can be accomplished with reasonable certainty before the acquisition is consummated.

In contrast, synergy with a human capital-intensive firm may require knowledge transfers that are difficult to predict. For example, the buyer may wish to transfer knowledge into the target or to import complementary knowledge from the target. The former may allow the buyer to exploit (e.g., leverage) its existing capabilities while the latter involves building new complementary resources (Haspeslagh & Jemison, 1991). Either way, value creation requires that knowledge or capabilities be transferred between the two firms. Thus, the combination will not result in synergies unless controls that support resource sharing can be implemented (Gupta & Govindarajan, 1986).

As such, buyers cannot specify, *a priori*, how much knowledge will be transferred and whether it can be deployed in a new setting—even if targets cooperate enthusiastically (Haspeslagh & Jemison, 1991; Polanyi, 1966; Teece, 1982). If there is tacit knowledge, there may be no way to convey it in negotiations (Zander & Kogut, 1995). Nevertheless, even explicit or general knowledge may be so complex that it is hard to convey (especially relative to tangible assets).

In general, it is harder to combine two firms when the cultural distance is great because individuals may not cooperate to transfer the knowledge (Nahavandi & Malekzadeh, 1988). This effect may be exacerbated for human capital-intensive firms, especially if the knowledge is encoded in the firm's unique language.

This is especially important since Barney (1988) suggests that buyers may only realize the gains arising from "unique" synergies. Targets are likely to capture the value associated with any synergies that are common to more than one bidder. Thus, if two firms have similar prospects for generating synergy, the target may appropriate most of the gains in a bidding war. That said, uncertain estimates of synergistic value creation do not pose a problem if no other bidder has the prospect of achieving synergy. In that case, the target will only be able to appropriate its stand-alone value.

Industry Human Capital as a Source of Uncertainty

The general arguments above about human capital and uncertainty apply at the industry-level as well. Human capital, like physical capital, is an input in the production process

for all industries. In addition, like physical capital, industries vary greatly in the amount and type of the resource used (Farjoun, 1994; Foss & Eriksen, 1995). In fact, variation across industries is likely to be more significant than variation within industries, due to commonalities in production functions and resources within an industry.

Of course, human capital also varies among firms within industries (Barney, 1991; Wernerfelt, 1984). In fact, this is a key underlying assumption in this article. If firms were homogeneous within industries, buyers would face little uncertainty as long as they knew the industry-level human capital intensity. Here, the industry-level variable may tell us when variation in human capital is most likely to introduce uncertainty into the buyer's valuation of the target. Put another way, firm-level variation in human capital is less of a hazard in physical asset-intensive industries. Accordingly, industry human capital intensity indicates when a buyer is most likely to face a hazard.

An example may help to illustrate. Human capital varies among firms within the sugar manufacturing and computer software industries. However, computer software is much more human capital-intensive than sugar manufacturing. The skills required in sugar manufacturing are probably not as rare or idiosyncratic as those in computer software.

A buyer cannot observe the firm-level variation in human capital for either industry as easily as physical capital. However, if the sugar employees turn out to be of lower skill than anticipated, the buyer can hire better employees or train existing ones. While this would require some resources, the firm's value would be largely intact. A buyer could conceivably do the same for a target in computer software except that human capital is central to the firm's value. If the programming work for a major new product turns out to be low in quality, the target's value may be greatly reduced.

Thus, while firm-level human capital may be hard to observe in either industry (compared to tangible assets), the impact on the firm's value is much greater in the human capital-intensive industry since human capital is the primary value-creating asset. Accordingly, a firm's value may carry greater uncertainty in human capital-intensive industries than in physical asset-intensive industries due to unobserved firm-level variation in human capital.

The Risk of Overpaying, Bidding Strategy, and Impasse

The uncertainty associated with estimating turnover and synergy may raise the risks of hubris, the winner's curse, and adverse selection for human capital-intensive targets. These dilemmas stem from uncertainty and asymmetric information in market transactions. As buyers and targets try to cope with these dilemmas, the likelihood of impasse may increase.

The Risk of Overbidding

Hubris. Since the target's value and synergistic potential are relatively hard to observe, the buyer may find it hard to confirm or, importantly, refute valuation assumptions. Accordingly, if buyers tend to overestimate their ability to generate synergy, they may bid based on these aggressive assumptions. Empirical evidence links overconfidence or hubris to unusually large bid premia (Hayward & Hambrick, 1997; Roll, 1986). This general problem

may be aggravated when it is hard to refute aggressive assumptions in a valuation model, particularly with respect to synergistic gains. As such, target human capital may contribute to the problem of hubris.

The winner's curse. The winner's curse is a risk when bidders face uncertainty. Even if all bidders have unbiased estimates of a target's value, the highest estimate is, by definition, above the true value (Giliberto & Varaiya, 1989). Since the estimates should be distributed around the true value, the highest estimate is, by definition, greater than the true value. For example, consider three bidders who value a software firm at US\$ 50, 60, and 70 million, respectively. If their estimates are unbiased, the true value would be US\$ 60 million. However, the high bidder would "win" the contest with a bid greater than US\$ 60 million if the bidders rely on their estimates as their final positions.

Therefore, to the extent that human capital is a source of uncertainty in target valuations, it may amplify the winner's curse problem. A high assessment of the target's value might include aggressive assumptions about turnover and the amount of synergy that would be created, while a low valuation might adopt conservative assumptions. If human capital creates variance between the high and low valuations, it would increase the risk of the winner's curse.

Adverse selection. Adverse selection is a related problem associated with uncertainty in valuations. Akerlof (1970) described how buyers respond in markets with imperfect information. Specifically, buyers formulate offers based on the expected value of a product, accounting for the possibility that it will turn out to be a lemon. As a result, owners of high quality products are unable to obtain fair offers. While they might provide buyers with signals of quality, these are suspect because sellers have an incentive to overstate the value. Accordingly, these "discounted" offers are low enough to keep high quality products out of the market. If human capital-intensive industries operate like markets for lemons, the firms offered for sale may include a disproportionate number of lemons—again increasing the risk that a buyer might overbid.

Bidding Strategy and Impasse

So how do bidders mitigate the risk of overbidding? Buyers might bid cautiously to reduce the risk of overbidding, or they may bid aggressively with the expectation that they will back out if due diligence reveals unanticipated risks and barriers. In either case, the result may be a lower likelihood that attempted acquisitions of human capital-intensive targets will ultimately close.

Cautious bidding and impasse. When facing a risk of the winner's curse, rational bidders reduce their bids to adjust for the likelihood of this dilemma (Thaler, 1992). The amount of this reduction depends on the degree of uncertainty. If human capital adds uncertainty, buyers may try to avoid overbidding by discounting their bids more for human capital-intensive targets.

Adverse selection problems call for a similar response. If buyers face greater uncertainty for human capital-intensive targets, such industries may operate more like markets for

lemons. That is, bids are adjusted down to reflect the likelihood that the target will turn out to be a lemon. Bids might still reflect a premium but the average premia may be lower in human capital-intensive industries.

This bidding strategy may lead to a greater likelihood of impasse for two reasons. First, the target may reject the offer as being too low. The buyer's expected value of what can be transferred may be considerably lower than the target's valuation of the going concern. For example, the buyer may have to discount for anticipated post-acquisition turnover that the target would not otherwise experience. In other words, the stand-alone value to the target would be greater than the stand-alone value to the buyer, due to anticipated post-acquisition turnover.

Second, a low offer might invite competing bidders into the contest. A low offer may signal that the firm is in play and can be acquired cheaply. This appeared to be what happened when British Telecom bid for MCI Communications. That is, even though alarming information seemed to surface during British Telecom's due diligence process, Worldcom and GTE entered the bidding contest.

Aggressive bidding and impasse. It is important to note that offers typically become public prior to the due diligence process when the target must share detailed records and operational information with the buyer. It is very difficult to keep the transaction completely confidential given the number of people involved in sharing information. Accordingly, prior to due diligence, the agreement is contingent upon what new facts emerge.

After gaining a better understanding of the business, the buyer may identify faulty assumptions in its valuation. For example, problems of organizational fit or cultural differences may become more apparent. The two management teams may recognize that they have irreconcilable visions for the combined entity as details emerge. Since these differences affect the projected value creation, it may be in either the buyer's or the target's interest to re-negotiate or back out of the acquisition. Even if a party seeks to re-negotiate rather than back out, reopening the negotiations decreases the likelihood that the transaction will ultimately be consummated.

An aggressive bidder may especially wish to take advantage of this ability to back out. Harstad and Rothkopf (1995) discuss the ability to withdraw as a form of insurance—the penalty that a bidder might pay for breaking the agreement is like an insurance premium. This provision may mitigate the risk of the winners' curse or of adverse selection. However, in doing so, it also increases the probability of impasse. For example, if the market is truly a *market for lemons*, a disproportionate number of targets that accept offers would be lemons—requiring the buyer to terminate the agreement. While impasse may be more likely, bidding aggressively may pre-empt rival bidders from entering the contest (Fishman, 1989)—a dilemma identified with cautious bidding.

In sum, whether the buyer responds to the risk of overbidding cautiously or aggressively, transactions that involve a high risk of overpaying may be less likely to close. Based on arguments presented in Section 1, this risk may be greater for human capital-intensive targets.

Hypothesis 1: Acquisition attempts are less likely to close as target human capital intensity increases.

Does Related Expertise Mitigate Information Dilemmas?

This section focuses on related expertise as a moderator for the relationship between human capital intensity and impasse. However, relatedness may act to either increase or decrease the likelihood that a transaction will close. On one hand, relatedness has implications for the amount of post-acquisition integration or change. On the other, related buyers may be better equipped to understand the target's knowledge base. In this way, human capital intensity and expertise relatedness may interact to predict the likelihood of impasse in acquisitions. This proposed interaction is depicted in Table 1 and the underlying logic is described in the next section.

Related Expertise and the "Threat" of Integration

Target resistance is a potentially significant source of impasse. It is very rare for a buyer to forge ahead with a hostile acquisition in the face of such resistance. Target resistance, in turn, is driven by a number of factors that generally reflect the extent and desirability of the changes that the acquisition would bring (Nahavandi & Malekzadeh, 1988).

Relatedness may be an indicator of desirability for the target. An unrelated buyer may lack the expertise to make substantive changes in the target (Pitts, 1976). In contrast, in highly related acquisitions, management may be well equipped to make major decisions for the acquired firm (Datta, 1991). Of course, this suggests that a related buyer may be less dependent on the target's management team, and perhaps, more likely to replace it. Consistent with this perspective, Datta and Grant (1990) found that unrelated acquisitions result in less post-acquisition integration.

In this way, relatedness may function as a proxy for the amount of post-acquisition change that the target might reasonably anticipate. This is especially true for the target's top management team since a highly related acquisition may leave them without a job. To

Table 1
Buyer hazards and the interaction between human capital and shared core competence

Target industry human capital intensity	Expertise relatedness of buyer and target	
	Unrelated expertise	Related expertise
Low	<i>p</i> (close) high Low information hazards and risk of target resistance: while the buyer lacks expertise, the assets are easy to evaluate and transfer. Target may not resist since they are needed	<i>p</i> (close) moderate Low information hazards but target resistance may hinder closing: the buyer has expertise to evaluate assets but the target may resist changes (e.g., replace management team)
High	<i>p</i> (close) low Poor information and target resistance hinder closing: the buyer lacks expertise to evaluate the assets and they may not transfer if the target perceives a large cultural distance	<i>p</i> (close) moderate Moderate information hazards and some risk of target resistance: the buyer has expertise to evaluate human assets and may convince people to stay (there will be few changes, etc.)

the extent that relatedness signals this type of organizational change, it may also reflect the likelihood of target resistance. This would suggest that as relatedness increases, the likelihood of impasse also increases.

Related Expertise, Absorptive Capacity and Enhanced Buyer Information

In contrast, the “information effect” of relatedness may go the other way. Up to this point, I have argued that target human capital poses serious information dilemmas for all buyers. However, some buyers are probably more at risk than others.¹ If the buyer has similar expertise, management may be in a relatively strong position to evaluate the target’s human capital and assess its synergy potential—reducing or even eliminating the information dilemmas already described.

Put another way, buyers with related expertise may have more absorptive capacity with respect to the target. Absorptive capacity refers to a firm’s ability to value, assimilate and apply new knowledge (Cohen & Levinthal, 1990). A buyer with similar industry expertise should be in a better position to understand, evaluate, and ultimately integrate the target’s knowledge. Accordingly, a related buyer should be at a lower risk of overbidding than a buyer that lacks absorptive capacity.

This means that the buyer’s risk of information dilemmas may be tied to whether the buyer is pursuing a strategy based on core competence. Core competence is a theory of diversification focused on expertise that can be applied across industries (Kim & Kogut, 1996; Prahalad & Hamel, 1990). Specifically, if a firm’s lines of business do not draw on a shared knowledge base, the headquarters may lack the expertise needed to add value (Williamson, 1975). For example, Nayyar (1993) found that related diversification might create value for service firms if they can leverage their reputation across customers. Here, the business units must draw on a core competence or customers will not value the reputational signal. Thus, it is not surprising to find that knowledge-based resources are associated with related diversification (Chatterjee & Wernerfelt, 1991).

The information dilemmas and governance problems associated with managing diverse business units may be very much like those that unrelated buyers face. If so, related expertise might mitigate information problems stemming from human capital. In contrast, when a buyer and target draw on unrelated expertise, the buyer is less likely to have access to the target’s knowledge base (Spender, 1989; Tsoukas, 1996). For example, one might require years to absorb even the explicit portion of a biochemist’s knowledge (e.g., that which is codified in textbooks). Yet, a buyer without that knowledge may face difficulties evaluating a biotechnology firm (relative to a related buyer). Specifically, an unrelated buyer could not easily determine the promise of the target’s research projects, which, in turn, form the basis of the firm’s value. Though the buyer might absorb such information over time from the target or other sources, the nature of the business is probably harder to convey in negotiations than it would be for a physical asset-intensive firm.

As such, many buyers may not face serious dilemmas arising from human capital because they draw on similar expertise. If related expertise mitigates information dilemmas, it is not surprising to find that relatedness is associated with knowledge-based resources in both acquisitions and diversification (Chatterjee & Wernerfelt, 1991; Coff, 1999). Thus, buyers of human capital-intensive targets are more related on average and may face minimal

information dilemmas. Nevertheless, the problems discussed earlier should remain for unrelated buyers.

Reconciling the Effects of Related Expertise: An Interaction Effect

In sum, relatedness, as a proxy for post-acquisition change, may negatively affect whether deals close. At the same time, it may have a positive impact if it helps to mitigate information dilemmas associated with human capital. How can these opposing forces be reconciled?

As depicted in Table 1, I propose that the relationship can best be represented as an interaction between human capital intensity and related expertise. The information value of relatedness may mitigate the dilemmas associated with human capital described earlier. A related buyer may also understand how to retain target human capital. For example, a related buyer may know not to initiate major changes in the target that would result in unintended turnover.

However, relatedness may not provide an information advantage for physical asset-intensive targets. In this case, the financial statements may adequately represent the firm's assets and turnover may be a less significant factor. It is precisely in this context that target management may feel most threatened by a related buyer.

Therefore, the information advantage of relatedness may dominate for human capital-intensive targets while the threat of post-acquisition integration may dominate for physical asset-intensive targets. In other words, the interaction of human capital and relatedness should predict when transactions are likely to close.

Hypothesis 2a: The likelihood of impasse increases as the degree of related expertise between the two firms increases for low levels of target industry human-capital intensity.

Hypothesis 2b: The likelihood of impasse decreases as the degree of related expertise between the two firms increases for high levels of target industry human-capital intensity.

Methods

Sample

Unlike other studies of mergers and acquisitions, this research requires data on acquisition attempts that failed to close. As such, the primary data source, ADP's mergers and acquisitions database, is relatively unique. The database provides descriptive data for the buyer and target along with basic transaction parameters for all publicly announced transactions totaling over US\$ 1 million. The sample included all attempted full acquisitions (324) that closed or failed to close in the years 1988–1989 for which the buyer and target data were available.

This eliminated private firms for which such information was not public. Since the private firms were typically partnerships assembled to conduct a single transaction, the industry coding precluded a valid measure of related expertise. Also, many of these partnerships

involved the target's management team, and thus, were management buyouts rather than corporate acquisitions.

Primary Measures

Deal closing. This binary variable reflects whether announced acquisition attempts ultimately closed. Unlike most other sources, ADP tracks announced acquisition attempts even if they end in impasse. However, many attempts fail even before they can be announced in a public forum. In the past, even the meager data on failures that is available has not been studied carefully.

Industry human capital intensity. I used an index made up of three measures of industry-level human capital intensity (Cronbach's $\alpha = .70$). These variables were also explored separately but the results were nearly identical. The variables "education" and "professionals" were taken from census data while "training" was drawn from the Bureau of Labor Statistics' National Longitudinal Survey of Youth (NLSY). The individual components of the index are described in the next section.

Education. Years of schooling is the most common measure of human capital (Becker, 1983; Mincer, 1974). Average industry education in the sample ranges from some high school (11 years of school) to some graduate school (17 years). While some individuals in each industry are above and below the average, it still helps to indicate which industries rely heavily on educated employees. Though it reflects explicit or codified knowledge, the complexity may make it hard to convey to those who do not have the same educational background. The potential mobility of such assets may pose a greater risk of turnover, which should introduce uncertainty into the target's estimated value.

Professionals. This reflects the percent of the target's industry employment that is made up of doctors, engineers, lawyers, managers, mathematical scientists and social scientists. Although this is related to education, it also captures some of the specialization in education and training. This ranges from 0 to 54% and, as expected, is strongly correlated with education (.74).

Training. The 12,000 NLSY respondents were asked about the number of hours of formal and informal training with peers, supervisors and self-study required to come up to speed in their job. This helps to identify industries that must train employees above and beyond what they acquire in school. The total hours of training were then aggregated at the respondent's industry-level (three-digit). This reflects the average number of hours of informal training required in each industry and ranges from 0 to 274 h of informal training. While this may be the weakest of the measures of human capital due to the NLSY sample size (once it is stratified by industry), training is a much harder construct to measure. Ultimately, this did not affect interpretation of the results.

Unrelated expertise. Core competence refers to expertise that can be leveraged across industries (Prahalad & Hamel, 1990). In this sense, very different product industries may

share a common form of expertise as an input. To measure the extent that the buyer and target have related expertise, I compared the occupational expertise profiles for the buyer and target industries.

The measure used here draws from Farjoun's (1994) expertise-based industry profiles and Klavens' (1990) expertise-based relatedness measure. Farjoun (1994) used industry expertise profiles to identify industry groups. He compared industries using 41, two-digit occupational categories as clustering variables from the Occupational Employment Survey. Klavens (1990) used the top two occupational categories for an industry to predict diversification patterns.

The Bureau of Labor Statistics conducts the Occupational Employment Survey, used by both Farjoun (1994) and Klavens (1990). It contains detailed occupational breakdowns by three-digit SIC codes. For each industry, it provides the percentage distribution of employees in over 823 occupational categories. In contrast to Farjoun (1994), this study draws on all 823, five-digit occupational codes to calculate the same Euclidean distance criterion. The finer delineation of expertise may make this measure more sensitive to the two firms' core competencies. For example, agricultural engineering and nuclear engineering cannot be differentiated using only the 41 categories that Farjoun used.

As a distance measure, this actually documents the extent to which the two firms' expertise profiles differ or do not overlap. Since this is actually useful in testing hypotheses, the measure was not reversed to measure "relatedness." It ranges from 0 to .94 and is expressed as follows:

$$\text{unrelated expertise} = \sum_{o=1}^{823} |EB_o - ET_o|$$

where EB_o is the percent of employees in the buyer's primary industry in occupation o , and ET_o is the percent of employees in the target's primary industry in occupation o .

Figure 1 illustrates the calculation of related expertise for two industries. If, for example, a pharmaceutical firm acquired a sugar manufacturer, the distance between the expertise profiles would be 52% (out of a possible 100%). This is calculated by summing the distance between the two industries for each occupation. The distance is smaller where the industries overlap or for occupations not employed in either industry. Much of the overlap occurs in generic categories such as management. However, even in these, the two industries differ somewhat in the types of required management expertise. The major sources of difference are in areas of core expertise. For example, sugar manufacturers do not generally employ biological scientists, chemists, or medical scientists.

Control variables. A number of control variables are included that reflect factors, other than human capital and shared expertise, that affect whether acquisitions close. The control variables reflect either attributes of the buyer, attributes of the target, or transaction parameters. The control variables are described along with the rationale for why they may impact the probability of deals closing. Table 2 provides descriptive statistics for all of the variables and helps establish the links between the control variables and the dependent variable.

Calculating Unrelated Expertise

Code	Occupational Category	(% of workers in occupation)		
		A Sugar Mfg.	B Pharmaceutical	C Distance
13002	Financial Managers	0.41	0.82	0.41
13005	Personnel/Human Resource managers	0.26	0.45	0.19
13014	Marketing/public relations managers	0.57	1.63	1.06
⋮	⋮	⋮	⋮	⋮
22135	Mechanical Engineering	0.47	0.00	0.47
24308	Biological Scientists	0.00	3.88	3.88
24105	Chemists	0.00	3.42	3.42
24311	Medical scientists	0.00	1.43	1.43
⋮	⋮	⋮	⋮	⋮
49005	Sales of scientific products or services	0.00	1.67	1.67
⋮	⋮	⋮	⋮	⋮
81008	1 st line supervisors	2.40	2.18	0.22
83005	Production inspectors	2.27	2.50	0.23
⋮	⋮	⋮	⋮	⋮
85110	Machinery maintenance mechanics	3.53	0.00	3.53
85132	Maintenance repairers, General utility	2.01	0.81	1.20
⋮	⋮	⋮	⋮	⋮
89808	Food batch makers	5.79	0.00	5.79
Partial Sum (of occupations shown)				23.50
Unrelated expertise (Σ distance over 823 occupations)				51.86

Figure 1. This figure illustrates how occupational expertise varies by industry. The occupational categories shown are relatively important in differentiating the two industries depicted (they are not a random sample of the 823 occupational categories).

Buyer experience. This is a dummy variable indicating whether the buyer had undertaken other acquisitions in the same period. Presumably, an active acquirer is more likely to have an acquisition competence in which the acquisition procedures are codified (Zollo & Singh, 1998). In addition, an active buyer is more likely to have in-house expertise and established relationships with advisors and financial intermediaries, which assure that the transaction is processed smoothly.

Raider. If the buyer has a history of conducting hostile acquisitions, there may be tension between the firms even if it is not officially hostile. If the target resists, the transaction may not close. Buyers were coded as corporate raiders if they were mentioned in Walsh and Kosnik (1993) article on corporate raiders or if they had attempted a hostile acquisition at any point during the 1980s. The correlation between raider and deal closing is $-.51$, attesting to the power of this variable.

Buyer sales/target sales. These two variables control for the size of the buyer and target. When a buyer is large compared to the target, the transaction may be described as more of an acquisition than a merger. That is, the larger firm will often emerge with control of the

Table 2
Descriptive statistics

	Mean	S.D.	1	2	3	4	5	6	7	8	9
Close	.65	(.48)	1.00								
Human capital ^a	.00	(1.00)	-.02	1.00							
Unrelated expertise ^a	.00	(1.00)	-.03	-.22***	1.00						
Buyer experience	.31	(.46)	.05	-.06	.17***	1.00					
Raider	.24	(.43)	-.45***	-.06	.05	.19***	1.00				
Buyer sales	6.33	(14.15)	-.03	.07 ⁺	.12**	.02	-.08*	1.00			
Premium	1.68	(1.37)	.01	-.04	-.08*	-.04	.03	-.04	1.00		
Rival bidders	.24	(.43)	-.24***	-.13**	-.06	.05	.26***	-.07*	.03	1.00	
Target sales	.88	(2.46)	-.12*	-.11**	.10**	.11**	.21***	.04	.01	.12***	1.00
Sales growth	2.94	(.66)	-.16**	.05	.08*	.07 ⁺	-.03	.03	.01	-.02	.04

^a The centered versions of these variables are used in analyses per Jaccard et al. (1990).

⁺ $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

combined entity. As such, the transaction may appear less desirable to target management since they stand to lose discretion and possibly even their jobs. Here, deals involving larger targets are less likely to close, suggesting that either the buyer is more likely to back out or that the target is more likely to resist.

Bid premium. This is the extent to which the offer exceeded the market value of the target 2 months before the announced bid (as reported by ADP). A relatively high bid premium may indicate that the transaction is more likely to close, since target shareholders should perceive the offer to be fair. In contrast, a low premium may lead to rejection, as discussed earlier.

Rival bidders. This binary variable is based on information ADP provided about whether there were rival bidders. By definition, if competitors emerge, it means that one or more of the bidders represents a transaction that did not close. Furthermore, the target may view one or more of the bidders as hostile. As such, it is not surprising to find that the presence of multiple bidders has a strong negative impact on whether acquisition attempts closed (−.24).

Target sales growth. Target 5-year sales growth is also calculated from COMPUSTAT data. A strong track record of target growth may mean that its shareholders perceive that target management has done a good job. Accordingly, if management rejects an offer, the shareholders may be more likely to support management's judgment. In contrast, shareholders for a poorly performing target may welcome the opportunity of a premium to divest their holdings. This may also be consistent with the adverse selection problem discussed earlier. That is, if buyers discount offers to avoid overbidding, well-performing targets may not receive offers that they feel are fair. Consistent with this line of reasoning, sales growth is negatively associated with deal closing (−.16).

Empirical Model

Since the dependent variable (close) is binary, a maximum likelihood estimation procedure is required. Specifically, the empirical model used here, complementary log–log analysis, is similar to logistic or probit models. Complementary log–log analysis differs in that the transformation is not symmetric. This is especially useful when one of the outcomes is relatively rare (Long, 1997). It should be noted that the results were nearly identical when using a standard logistic model.

In order to construct the interaction variables, human capital and unrelated expertise were centered. This transformation is necessary to minimize the impact of multicollinearity caused by interaction terms (see Jaccard, Tursi & Wan, 1990 for additional details).

Results

Although target industry human capital and unrelated expertise are not correlated with whether transactions closed (see Table 2), Hypothesis 2 focused on interaction effects and the main effects may not be relevant. The basic proposition in this study is that acquisitions

of human capital-intensive targets are harder to close when the buyer and target draw on unrelated expertise.

Accordingly, the regression models are shown in Table 3. The first model reflects only the control variables (model A). The next (model B) includes the main effects of human capital and unrelated expertise. The last model (C) tests the interaction proposed in Hypothesis 2.

The model with only the control variables (model A) fits the data quite well. In addition to having a significant Chi-square statistic, the model classifies 81.7% of the cases accurately and has an adjusted pseudo- R^2 of .37. This is not surprising, given the importance of these variables in predicting transaction outcomes. Indeed, much of the variance is explained by the existence of raiders, rival bidders, or target sales growth. In each case, these suggest that a buyer's offer might be perceived as threatening and will be resisted by the target. In contrast, buyer experience has a positive effect, suggesting that an experienced buyer is less likely to uncover risks of problems that they did not anticipate before bidding.

When the main effects are added (model B), the fit is improved somewhat and human capital is significant in the predicted direction. While this provides some support for Hypothesis 1, the evidence is not particularly strong since the coefficient is only significant at the .05 level and the change in fit is similarly modest (Δ Chi-square = 5.14/2df, $p < .05$). Since Hypothesis 2 examined the interaction between human capital and unrelated expertise, the main effect may be of secondary interest in any case.

Table 3
Complementary log–log regression on $p(\text{close})$

	Controls only (A)	S.D.	Controls + main effects (B)	S.D.	Controls + interactions (C)	S.D.
Control variables						
Buyer experience	.558**	(.193)	.540**	(.195)	.572**	(.201)
Raider	−1.458***	(.216)	−1.489***	(.218)	−1.561***	(.225)
Buyer sales	−.010	(.007)	−.010	(.007)	−.010	(.007)
Premium	.010	(.108)	.014	(.109)	−.003	(.112)
Rival bidders	−.772***	(.179)	−.881***	(.189)	−1.005***	(.196)
Target sales	.010	(.038)	−.008	(.039)	−.030	(.040)
Sales growth	−.356**	(.117)	−.363**	(.120)	−.387**	(.125)
Independent variables						
Unrelated expertise			.085	(.088)	.136 ⁺	(.093)
Human capital			−.177*	(.093)	−.300**	(.103)
Human capital × unrelated expertise					−.310***	(.100)
Pseudo- R^2	.37		.39		.42	
−2 Log likelihood	315.29				300.10	
Chi-square/df	102.49/7***		107.63/9***		117.69/10***	
Correct classifications (%)	81.7		82.7		83.7	

⁺ $p < .10$

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Interaction of Human Capital and Related Expertise

Model C tests Hypothesis 2—relatedness mitigates the information problems inherent in human capital-intensive targets. The pseudo- R^2 was .42, for an increase of 5% over the controls-only model. Furthermore, the log likelihood ratio is significantly improved over the controls-only model ($\Delta\text{Chi-square} = 15.19/3\text{df}$, $p < .001$). Although the incremental contribution from the independent variables was relatively small, this does not necessarily mean that the results are trivial. The factors that account for the other 37% of explained variance include: corporate raiders, rival bidders, the buyer’s experience, and the target’s growth. The reasons for these being important are fairly obvious and it is not necessarily surprising that they explain a large portion of the variance.

The fact that the human capital and related expertise results are robust even when these critical controls are present is worth noting. That is, the predicted effects may not be the most important predictors, but they are significant even when these control variables are included.

Following Aiken and West (1996), the simple main effects were calculated by centering the human capital variable first at one standard deviation above the mean and then one standard deviation below the mean. In this way, we are able to evaluate the slope of expertise relatedness for high and low levels of human capital. First, the simple main effects were significant in both cases (high and low human capital) confirming the results in the traditional model. Figure 2 presents a graph of these effects and helps to confirm the

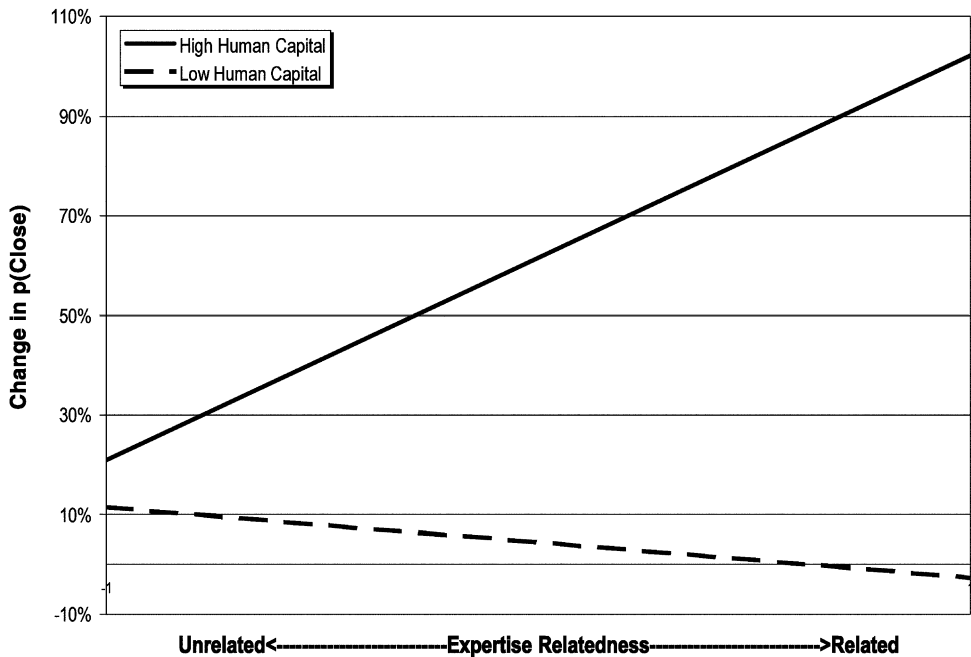


Figure 2. Interaction of human capital and relatedness.

interpretation. The solid line depicts an upward-sloping relationship between relatedness and the likelihood of closing for targets in human capital-intensive industries. This suggests that related expertise may mitigate the information dilemmas associated with human capital.

In contrast, the low human capital line is downward-sloping (dashed line). This is consistent with the assertion that relatedness reflects the degree of integration and accordingly, with the likelihood that the target may resist the offer. While this effect would also be present for human capital-intensive targets, the information value of relatedness is present to offset this effect. Accordingly, Hypotheses 2a and 2b are supported.

Discussion and Implications

The results offer evidence in support of the hypotheses that related expertise can mitigate hazards associated with human capital intensity. In this setting, related expertise increases the probability that a given transaction will close. In contrast, there is also evidence that related expertise is associated with impasses in targets that are not in human capital-intensive industries. This effect appears to be equally strong. As suggested earlier, such targets may resist offers if related buyers initiate more change, and are more likely to terminate target management.

This study is intended as a starting point for additional research. There has been almost no empirical exploration of acquisitions that failed to close and certainly nothing that focuses on human capital and related expertise. As such, these findings have a number of implications for management theory, research methods, and for practicing managers.

Implications for Strategic Management Theory

This study especially has implications for future research linked to resource-based theory and corporate diversification. Both focus on expertise, asymmetric information, and capabilities that are hard to imitate. Accordingly, human capital is a central theme.

Human capital is a key component of the resource-based view because it is a starting point from which firms develop inimitable capabilities (Barney, 1991; Conner & Prahalad, 1996). Although this study examines human capital at the industry level, the effect might be similar, or even amplified, if firm-level differences in human capital were measured and included. This suggests that additional research should study human capital intensity using firm-level measures of the construct.

Also, most of the resource-based literature focuses on what resources have potential for a sustainable advantage rather than on the management dilemmas that such resources create (Amit & Schoemaker, 1993; Reed & DeFillippi, 1990). These findings suggest that firms may, in some cases, need related expertise in order to acquire strategic assets. This may be a *Catch-22* for buyers wishing to acquire new competencies. The same factors that make such assets the source of a competitive advantage also pose hazards in acquisitions that may lead to impasse.

Chi (1994) suggested that measurement dilemmas might make cooperative ventures a more effective way to obtain strategic capabilities than acquisitions. Additional research

might explore this possibility. Given these dilemmas, what factors drive buyers to nonetheless prefer acquisitions? This especially applies to unrelated buyers who face the most serious information disadvantages.

The diversification literature may also be informed by this study. There are many anomalous findings regarding the relationship between diversification and performance (Ramanujam & Varadarajan, 1989). The interaction between core competence (e.g., related expertise) and human capital appeared to be important in this study.

If this contingency perspective of knowledge-based assets applies to the diversification literature, it may open important new lines of inquiry. Normally, it is assumed that related diversification always creates more value. However, this study suggests that related expertise is only helpful when acquiring human capital-intensive targets. Some of the inconclusive findings in the diversification literature may be untangled if human capital intensity affects what type of diversification is efficient.

Implications for Research Methods

The primary empirical challenge is for better measures of shared expertise. It is unclear at this point whether related expertise is an industry or firm-level phenomenon. An industry-level interpretation of the results might be that human capital-intensive industries operate more like markets for lemons. As such, the industry-level variables suggest the degree of uncertainty that buyers face rather than the target's actual human capital. Put another way, industry-level human capital tells us when unobserved firm-level variation is most likely to impact the firm's value. While it is not a measure of the target's human capital, the industry-level variable does indicate when such variation is most likely to introduce uncertainty into the transaction.

Of course, the industry-level variable may also be a reasonable proxy for the target firm's human capital intensity. The resource-based view is fraught with unobservable constructs. Accordingly, the paradigm can only be advanced by testing predicted relationships among observable variables. Godfrey and Hill (1995: 530) wrote:

It is by construction impossible to assess the degree of unobservability of an unobservable, since by definition inimitable resources are unobservable (Barney, 1991). One way out of this trap is for scholars to focus on observable variables that determine the degree of unobservability of a rare and valuable resource . . . The analogy here is with quantum mechanics, which has been confirmed *not* by observing subatomic entities (since they are unobservable), but by observing the trail left by subatomic entities in the cloud chambers of linear accelerators.

Here, the unobservable nature of knowledge-based assets is at the core of the resource-based view. In addition, the very fact that such assets are unobservable may make corporate acquisitions a more desirable source than spot labor markets. At the same time, the unobservability of the assets should also pose hazards for acquisitions.

As such, industry-level human capital may be an observable manifestation linked to unobservable constructs in the resource-based view. In this sense, while it is not a perfect measure of the target's human capital, this study, coupled with further inquiry, may help to clarify dilemmas in how firms acquire strategic resources. Still, the measures are crude and

further research should include both qualitative and quantitative approaches to triangulate on the phenomenon.

Implications for Managers

Finally, this study has implications for managers given the emerging perspectives in strategic management. Increasingly, differences in firm performance are attributed to tacit knowledge (Barney, 1991; Peteraf, 1993; Reed & DeFillippi, 1990; Wernerfelt, 1984). A firm may enjoy a sustained advantage because rivals cannot obtain or imitate its resources.

Under these circumstances, corporate acquisitions might seem to be an attractive way to gain an advantage. This inquiry contributes by examining the hazards associated with acquiring human capital in this way. In doing so, it builds on Haspeslagh and Jemison's (1991) work by placing the acquisition process in the context of a strategy to build a competitive advantage. This research helps to focus attention on the management problems associated with acquiring and managing knowledge.

Note

1. Relatedness would have different implications if we were predicting value creation as opposed to impasse. Value creation depends on the complementarity of the assets and identical expertise might lower value creation prospects. In other words, relatedness should have a curvilinear relationship with value creation. Here, expertise is a proxy for information asymmetries rather than value creation potential.

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References

- Aiken, L. S., & West, S. G. 1996. *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.
- Akerlof, G. A. 1970. The market for lemons: Quality uncertainty and the market mechanism. *Quarterly Journal of Economics*, 84: 488–500.
- Amit, R., & Schoemaker, P. J. H. 1993. Strategic assets and organizational rent. *Strategic Management Journal*, 14: 33–46.
- Barney, J. B. 1986. Strategic factor markets: Expectations, luck, and business strategy. *Management Science*, 32(10): 1231–1242.
- Barney, J. B. 1988. Returns to bidding firms in mergers and acquisitions: Reconsidering the relatedness hypothesis. *Strategic Management Journal*, 9: 71–78.
- Barney, J. B. 1991. Firm resources and sustained competitive advantage: A comment. *Journal of Management*, 17(1): 99–120.

- Becker, G. 1983. *Human capital: A theoretical and empirical analysis with special reference to education*. Chicago, IL: University of Chicago Press.
- Buono, A., & Bowditch, J. L. 1989. *The human side of mergers and acquisitions: Managing collisions between people and organizations*. San Francisco: Jossey Bass.
- Cannella, A. A., & Hambrick, D. C. 1993. Effects of executive departures on the performance of acquired firms. *Strategic Management Journal*, 14: 137–152.
- Chang, C., & Wang, Y. 1996. Human capital investment under asymmetric information: The Pigovian conjecture revisited. *Journal of Labor Economics*, 14(3): 505–519.
- Chatterjee, S., & Wernerfelt, B. 1991. The link between resources and type of diversification: Theory and evidence. *Strategic Management Journal*, 12(1): 33–48.
- Chi, T. 1994. Trading in strategic resources: Necessary conditions, transaction cost problems, and choice of exchange structure. *Strategic Management Journal*, 15(4): 271–290.
- Chiang, S. H., & Chiang, S. C. 1990. General human capital as a shared investment under asymmetric information. *Canadian Journal of Economics*, 23(1): 175–188.
- Coff, R. 1999. How buyers cope with uncertainty when acquiring firms in knowledge-intensive industries: Caveat emptor. *Organization Science*, 10(2): 144–161.
- Cohen, W. M., & Levinthal, D. A. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35: 128–152.
- Conner, K. R., & Prahalad, C. K. 1996. A resource-based theory of the firm: Knowledge vs. opportunism. *Organization Science*, 7(5): 477–501.
- Datta, D. K. 1991. Organizational fit and acquisition performance: Effects of post-acquisition integration. *Strategic Management Journal*, 12: 281–298.
- Datta, D. K., & Grant, J. 1990. Relationships between type of acquisition, the autonomy given to the acquired firm, and acquisition process: An empirical analysis. *Journal of Management*, 16(1): 29–44.
- Farjoun, M. 1994. Beyond industry boundaries: Human expertise diversification, and resource-related industry groups, and resource-related industry groups. *Organization Science*, 5(2): 185–199.
- Fishman, M. J. 1989. Pre-emptive bidding and the role of the medium of exchange in acquisitions. *Journal of Finance*, XLIV: 41–57.
- Flamholtz, E. G., & Coff, R. 1994. Human resource valuation and amortization in corporate acquisitions: A case study. *Advances in Management Accounting*, 3: 55–83.
- Foss, N. J., & Eriksen, B. 1995. Competitive advantage and industry capabilities. In C. A. Montgomery (Ed.), *Resource-based and evolutionary theories of the firm*. Boston: Kluwer Academic Publishers.
- Giammarino, R., & Heinkel, R. 1986. A model of dynamic takeover behavior. *Journal of Finance*, 41(2): 465–480.
- Gilberto, M. S., & Varaiya, N. P. 1989. The winner's curse and bidder competition in acquisitions: Evidence from failed bank auctions. *Journal of Finance*, 44(1): 59–75.
- Godfrey, P. C., & Hill, C. W. L. 1995. The problem of unobservables in strategic management research. *Strategic Management Journal*, 16: 519–533.
- Gupta, A. K., & Govindarajan, V. 1986. Resource sharing among SBUs: Strategic antecedents and administrative implications. *Academy of Management Journal*, 29(4): 695–714.
- Harstad, R. M., & Rothkopf, M. H. 1995. Withdrawable bids as winner's curse insurance. *Operations Research*, 43(6): 983–994.
- Haspeslagh, P., & Jemison, D. 1991. *Managing acquisitions: Creating value through corporate renewal*. New York, NY: Free Press.
- Hayward, M. L., & Hambrick, D. C. 1997. Explaining premiums paid for large acquisitions: Evidence of CEO hubris. *Administrative Science Quarterly*, 42(1): 103–127.
- Itami, H. 1987. *Mobilizing invisible assets*. Cambridge, MA: Harvard University Press.
- Jaccard, J. J., Tursi, R., & Wan, C. K. 1990. *Interaction effects in multiple regression*. Thousand Oaks, CA: Sage.
- Jensen, M. C. 1988. Takeovers: Their causes and consequences. *Journal of Economic Perspectives*, 2(1): 21–48.
- Kim, D. J., & Kogut, B. 1996. Technological platforms and diversification. *Organization Science*, 7(3): 283–301.
- Klavens, R. 1990. Acquisitions: Resource dependency vs. human resource perspectives. *Academy of Management Best Papers Proceedings*: 170–174.
- Long, J. S. 1997. *Regression models for categorical and limited dependent variables*. Thousand Oaks, CA: Sage.
- Mergers & Acquisitions Journal 2000. *M&A scoreboard*, 34(4): 57–68.
- Mincer, J. 1974. *Schooling, experience, and earnings*. New York, NY: NBER, Columbia University Press.

- Nahavandi, A., & Malekzadeh, A. 1988. Acculturation in mergers and acquisitions. *Academy of Management Review*, 13(1): 79–90.
- Nayyar, P. 1993. Performance effects of information asymmetry and economies of scope in diversified service firms. *Academy of Management Journal*, 36(1): 28–57.
- Nonaka, I. 1994. A dynamic theory of knowledge creation. *Organization Science*, 5(1): 14–37.
- Peteraf, M. A. 1993. The cornerstone of competitive advantage: A resource-based view. *Strategic Management Journal*, 14: 179–191.
- Pitts, R. A. 1976. Diversification strategies and organizational policies of large diversified firms. *Journal of Economics and Business*, 28: 181–188.
- Polanyi, M. 1966. *The tacit dimension*. New York: Anchor Day Books.
- Prahalad, C. K., & Hamel, G. 1990. The core competence of the corporation. *Harvard Business Review*: 79–91.
- Ramanujam, V., & Varadarajan, P. 1989. Research in corporate diversification: A synthesis. *Strategic Management Journal*, 10: 523–551.
- Reed, R., & DeFillippi, R. J. 1990. Causal ambiguity, barriers to imitation, and sustainable competitive advantage. *Academy of Management Review*, 15(1): 88–102.
- Roll, R. 1986. The hubris hypothesis of corporate takeovers. *Journal of Business*, 59: 197–216.
- Spence, M. 1973. Job market signaling. *Quarterly Journal of Economics*, 87: 355–374.
- Spender, J. C. 1989. *Industry recipes*. Oxford: Blackwell.
- Teece, D. 1982. Towards an economic theory of the multiproduct firm. *Journal of Economic Behavior and Organization*, 3(1): 38–63.
- Thaler, R. H. 1992. *The winner's curse: Paradoxes and anomalies of economic life*. New York: Free Press.
- Tsoukas, H. 1996. The firm as a distributed knowledge system: A constructionist approach. *Strategic Management Journal*, 17: 11–26 (winter special issue).
- Wall Street Journal 1995. *Industry soothsayers wonder: How long will Lou woo Jim*: June 13, A3.
- Wall Street Journal 1997. *Why an acquisition? Often it's the people*: October 6, A7.
- Walsh, J. P., & Ellwood, J. W. 1991. Mergers, acquisitions and the pruning of managerial deadwood. *Strategic Management Journal*, 12(3): 201–217.
- Walsh, J. P., & Kosnik, R. D. 1993. Corporate raiders and their disciplinary role in the market for corporate control. *Academy of Management Journal*, 36(4): 671–700.
- Wernerfelt, B. 1984. A resource-based view of the firm. *Strategic Management Journal*, 5: 171–180.
- Williamson, O. 1975. *Markets and hierarchies analysis and antitrust implications: A study in the economics of internal organization*. New York: Free Press.
- Zander, U., & Kogut, B. 1995. Knowledge and the speed of the transfer and imitation of organizational capabilities. *Organization Science*, 6(1): 76–92.
- Zollo, M., & Singh, H. 1998. The impact of knowledge codification, experience trajectories and integration strategies on the performance of corporate acquisitions. *Academy of Management Best Paper Proceedings*, BPS: L1–L10.

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