ENTRY, EXIT, AND THE POTENTIAL FOR RESOURCE REDEPLOYMENT

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Research summary: *Combining the concept of resource relatedness with the economic notion of sunk costs, we assess how the potential for resource redeployment affects market entry and exit by multi-business firms. If the performance of a new business falls below expectations, a diversified firm may be able to redeploy its resources back into related businesses. In effect, relatedness reduces the sunk costs associated with a new business, which facilitates exit. This, in turn, has implications for entry: By decreasing the cost of failure, the potential for redeployment justifies the undertaking of riskier entries and greater experimentation. These dynamic benefits of relatedness are distinct from standard notions of "synergy." To show support for this idea, we provide a mathematical model, descriptive data, and company examples.*

Managerial summary: *The ability to redeploy resources inside the firm reduces the cost of entry "mistakes." If a new business turns out to have poor profitability, the ability to redeploy more of its resources back into the firm's other businesses allows recycling of investment and can speed up the retreat. This reduces not only the cost of exit, but also the cost of entry. Managers should therefore be more willing to experiment and take risks in developing businesses that are more related to the firm's existing businesses, whereas if redeployment is likely to be difficult, managers should be cautious about entering. New businesses should be chosen in ways that facilitate redeployment, and managers should consider the implications of redeployment when setting the performance thresholds that justify entry and exit.* Copyright © 2016 John Wiley & Sons, Ltd.

INTRODUCTION

Researchers in corporate strategy have long argued that resource relatedness contributes to a firm's competitive advantage by promoting intra-temporal economies of scope, also known as "synergy." In this article, we build on recent developments that distinguish between inter-temporal and intra-temporal scope economies to extend our understanding of the potential advantages of multi-business firms in entering and exiting new businesses. We show that relatedness can reduce the cost of exit by facilitating the redeployment of resources back into the firm's existing businesses. Such ability to redeploy within the firm has two important implications: It speeds up exit from underperforming businesses, and it lowers the cost of experimenting with new businesses in the vicinity of the firm's existing businesses.

The mechanism we propose—resource redeployment—synthesizes the resource-based view of the firm with the economic theory of

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sunk costs in the context of optimal entry and exit (Dixit, 1989, 1992). To enter a new business, it is necessary for a firm to make an investment, a proportion of which will be sunk or irrecoverable upon exit. We submit that firms whose existing businesses are more closely related to the new business are likely to have a higher potential for resource redeployment. Typically, such firms have greater opportunities to redeploy resources internally upon exiting the new business, with lower redeployment costs and shorter redeployment delays. All else equal, the higher the potential for resource redeployment, the lower the sunkness of the firm's investment in the new business, since a larger portion of the investment can be recovered by redeploying the resources internally within the firm. Therefore, more related diversifiers are likely to have *de facto* lower sunk costs, which imply faster exit from low-performing businesses.

This sunk-cost logic has theoretical and empirical implications for the study of both entry and exit. First, a decrease in sunk costs—arising from greater ability to redeploy a business's assets internally or sell them externally—reduces the minimum threshold of expected performance that is required to justify entry. As a consequence, a firm that recognizes these incentives will attempt more entries; the average quality of its entries will be lower; and the average probability of success of the entries is also lower (holding the distribution of entry opportunities constant). Second, a greater potential for resource redeployment raises the level of performance required to maintain a business after the firm has entered. This leads the firm to cut off a new business sooner if its performance falls below expectations. The combined effect of these performance thresholds means that diversified firms should be more inclined to enter related businesses as well as to exit them. It also follows that conglomerates will be slow to exit businesses because they will have few opportunities for internal redeployment. Furthermore, it implies that the prominent effect of relatedness on *entry* is due not only to the potential for synergy, but also to the potential for folding resources back into the firm to facilitate exit if the performance of the new business proves mediocre or poor.

Our story around sunk costs also helps to connect corporate strategy with research on entrepreneurship. In the event of poor performance—a common outcome given the uncertainty of new businesses—an entrepreneurial start-up faces three options. It can persist in the business, redeploy its resources into a new business, or exit by selling (or in extreme cases, abandoning) the assets of the business. A multi-business firm with a low-performing business also faces these options. It may, however, have a further option: to redeploy resources back into the firm's existing businesses. Multi-business firms that anticipate and exploit the flexibility associated with this option enjoy significant advantages in market entry, relative to start-up firms.

In the next section, we briefly review the empirical studies on the relation between relatedness and exit. Then, we develop connections between sunk costs and resource redeployment within a multi-business firm. To support our theory, we present a simple mathematical model and some empirical evidence consistent with our theory from a sample of 1,575 entries (481 exits) in the U.S. telecommunications and Internet sector. Given the difficulty of distinguishing the dynamic effects of sunk costs from the more conventional effects of synergy, we triangulate with multiple pieces of evidence. We elaborate on managerial implications of our theory in the discussion section.

LITERATURE REVIEW

Sunk costs, exit, and entry

The traditional resource-based view of the multi-business firm focuses on intra-temporal or static economies of scope, which are derived from the contemporaneous sharing of resources across businesses. In this article, we refer to these economies, which reduce the joint costs of production, by the common name of "synergy." By contrast, inter-temporal economies of scope are derived from the redeployment of resources between businesses over time, as resources are withdrawn from one business and transferred to another (Helfat and Eisenhardt, 2004).

Synergy implies a negative relation between relatedness and exit: The more related a business is to the firm's other businesses, the less likely the firm will exit that business. The empirical evidence, however, shows surprisingly weak support. Sharma and Kesner (1996), Chang and Singh (1999), and Karim (2006) found no relationship between exit and relatedness, whereas Chang (1996) found firms more likely to exit less-related businesses. O'Brien and Folta (2009) observed that, after controlling for business unit profitability, firms were more likely

to exit less-related businesses, although this effect was reversed under conditions of high uncertainty.[1] Studies that have focused on how relatedness influences the divestiture of acquired business units also show conflicting findings. Ravenscraft and Scherer (1991) observed that acquired units outside their parent company's core business have higher rates of divestiture. In contrast, Shimizu (2007) found that business unit relatedness has no effect on exit from acquired businesses, and Kaplan and Weisbach (1992) noted that divestiture rates are similar whether or not acquirers and targets share a common two-digit SIC code. Thus, roughly half of the empirical studies have concluded that relatedness has no effect on exit. This stands in contrast to the prediction based on the theory around "synergy," and the overwhelming evidence that relatedness encourages entry (e.g., Montgomery and Hariharan, 1991; Silverman, 1999). We argue that this paradox can be resolved by recognizing the connection between relatedness and sunk costs, which can potentially offset the synergy effect on exit.

It is well documented that firms keep their businesses going for lengthy periods while absorbing operating losses. This inertia, or hysteresis, can be explained through the logic of Marshall (1890), who reasoned that firms remain in a market even if prices drop below average cost, as long as variable costs are covered.[2] More recent treatments of hysteresis have concluded that Marshall's story under-represents the extent of inertia because it ignores the dynamic implications of making sunk-cost investments under uncertainty (Dixit, 1989; Krugman, 1989).

Sunk costs occur when "an expenditure … cannot be recouped if the action is reversed at a later date" (Dixit, 1992: 108), and expenditures are more sunk when divestment yields a lower proportion of the original investment. Dixit (1989) argued that sunk costs influence the level of performance that triggers optimal entry and exit. The intuition of his argument is illustrated in Figure 1 (adapted from Dixit, 1989, Figure 2). The lower line depicts the exit threshold, which is a decreasing function of sunk costs: With higher sunk costs, greater losses

are required to induce exit. The horizontal line at the cost of capital represents the exit threshold in the absence of sunk costs; with no sunk costs, the firm optimally exits a business as soon as it encounters losses (imposed by price or cost fluctuations), and re-enters the business as soon as conditions again enable profitable operation. In the presence of sunk costs, the firm will persist in poorly performing business, where the extent of persistence increases with the degree of sunk costs. These predictions have received empirical support.[3]

To illustrate how this logic might apply to corporate strategy, consider a firm with two new businesses, A and B, having identical initial expected profit, E_0, but different degrees of sunk costs (B > A). Assume that in both businesses the initial expected profit is above the entry threshold, but the actual profit that is realized, *ex post*, turns out to be below. Suppose expected profit falls in each period (declining from E_0 to E_5) as the firm gradually learns about the true returns of businesses A and B. Given that the exit threshold is a decreasing function of sunk costs, the firm will exit A faster than B (see Figure 1). Thus, with higher sunk costs, managers tolerate greater losses before pulling the plug on an underperforming business.[4]

Dixit's analysis also implies that managers, anticipating this effect of sunk costs on exit, should require a higher threshold of expected profit to justify entering a business when sunk costs are high. The upper line in Figure 1 depicts this entry threshold, an increasing function of sunk costs. If entry opportunities are distributed more or less randomly across the two-dimensional space represented in
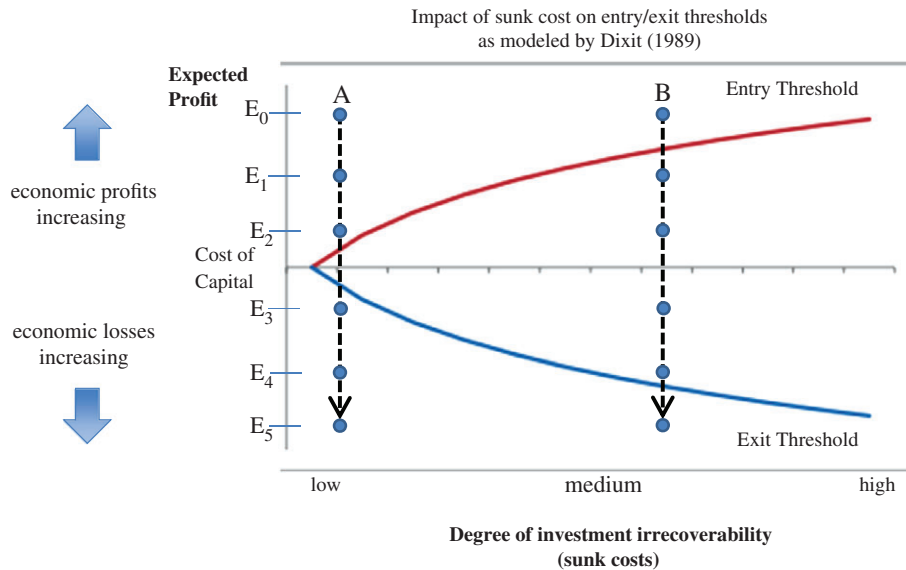

Figure 1.   Entry and exit thresholds change with the degree of investment irrecoverability

Figure 1, sunk costs will be a primary determinant of optimal entry and exit decisions. Under conditions of low sunk costs, a firm should attempt more entries and exit faster from entries that perform poorly. Under conditions of high sunk costs, the initial expected profit needs to be well above the cost of capital to compensate for possible "entrapment" in the zone where realized returns fall below the cost of capital but above what the firm can recover from terminating the business. Managers who understand this logic will freely "experiment" with entries whose sunk costs are low but will be quite cautious about entering businesses whose sunk costs are high.

THEORY DEVELOPMENT

Multi-business firms, resource redeployment, and the speed of exit

Multi-business firms differ from the generic single-business firm represented in Dixit's model. In addition to being able to recover value through the external sale of resources, a multi-business firm may be able to recover value by withdrawing resources from one business and redeploying these resources to (one or more) other businesses, which constitute an internal market for the resources.[5]

If a multi-business firm can recover more value through internal redeployment than through divestment, the redeployment mechanism reduces the sunkness of the original investment. Thus, having the potential to internally redeploy resources may enable a multi-business firm to be more flexible than a single-business firm, whose only alternative is divestment in external markets. For example, Lieberman (1990) found that in the chemical industry, multi-product firms were more likely to exit from declining product markets.

According to the relation developed earlier between sunk costs and exit, the potential for resource redeployment changes the level of performance required to justify continuation of a business. With greater potential for redeployment, managers will require higher performance to persist in the business and will set a threshold that encourages earlier exit if profit falls below expectations. This yields the following proposition linking the potential for resource redeployment and the speed of exit.

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[5]Redeployment also raises the likelihood that resources can be applied to re-establish the original business at re-entry costs that

are lower than those of *de novo* entry. Re-entry may be more commonly considered by related diversifiers. As an example, upon exit from the personal navigation device market, telecommunications firm JVC's Bill Turner, Vice President of Mobile Entertainment, stated, "Primarily because the portable navigation business has turned into a price-only market with numerous new competitors entering almost daily, we opted to focus our business on the in-dash market instead . . . . We continue to study the portable navigation market and may re-enter it once we identify stabilization with regard to price points." (*Twice*, 2007).

Proposition 1: Other things equal, the greater the potential for redeploying resources from the new business back into a related diversifier's existing businesses, the faster the exit from the new business that performs below expectations.

Proposition 1 also has implications for entry. The logic of Dixit's model implies that the profit thresholds for both entry and exit are influenced by sunk costs:[6]

Proposition 2: The greater the potential for redeploying resources from the new business back into a related diversifier's existing businesses, the lower the expected profit needed to justify entry.

Factors determining when internal redeployment is more efficient than divestment

A multi-business firm has the option to exit a business by selling its assets, as a whole or in parts, on the external market. Thus, the degree of sunk costs in a given business is determined not just by the potential for internal redeployment, but also by the value that can be attained from external divestment. We now expand the logic of our argument to deal with the fact that a multi-business firm can choose between these exit options.

In exiting from a business, a multi-business firm must decide whether to recover value internally (via redeployment) or externally (via divestment). Although both avenues can be used in parallel (e.g., employees transferred internally with physical assets sold externally), one mode is usually dominant. Several factors determine which mode recovers the most value.

Internal redeployment has an advantage in that it avoids the transaction costs associated with external markets (Matsusaka and Nanda, 2002). These include acquisition or divestment fees paid to investment bankers or business brokers, the search costs of potential buyers, and the costs to the firm of laying off employees. Laying off personnel may require significant payments of unemployment benefits, severance, and other entitlements such as early retirement.

Moreover, the price that can be obtained for the business on external markets, sold as a whole or in parts, depends on the fit of the assets with other firms' businesses and the degree of competition for those assets. For example, if the business was recently acquired, its resale may be comparatively easy; such a business may still be intact as a stand-alone unit, and its prior sale establishes a historical price. By comparison, an idiosyncratic new business created through a process of internal development is less likely to be attractive to external buyers, and the mere fact that the firm wishes to sell it may be perceived as a negative signal. External divestment of such a business may entail substantial layoffs and minimal salvage value of tangible and intangible assets. Thus, the relative attractiveness of internal redeployment versus external divestment is likely to be influenced by the mode by which the firm entered the business.[7]

Similarly, internal redeployment may be more efficient than divestment if resources are simultaneously firm-specific and usage-flexible. A resource is "specific to a firm if its value to the firm exceeds its price in the factor market," and is flexible to a usage if its value does not decrease when applied differently (Ghemawat and del Sol, 1998: 28). Resources may be firm-specific if there is interdependence among a firm's resources (Alchian, 1984). For example, 3M's innovative ability within a specific business unit is due not only to the technical knowledge embedded in that unit's human and intellectual capital, but also to how it interacts with the company's culture for innovation.[8] Resources may

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[6]The logic behind Proposition 2 is more dynamically complex than the logic underlying Proposition 1. Thus, we suspect that managers often fail to recognize and respond to the incentive that it implies, given that significant foresight is required to understand how differences in the cost of exit should affect the profit requirements for entry. By comparison, Proposition 1 requires merely that managers recognize and evaluate opportunities for redeployment in real time. Moreover, it is difficult to test the idea that resource relatedness lowers the profit threshold for entry. This is because such a threshold is hard to observe, and because synergy also encourages entry when relatedness is greater. For these reasons, we do not attempt an empirical test of Proposition 2 in this article, although we do present supportive evidence through a simulation model.

[7]The mode of entry affects both the divestment and the reconfiguration of business units. Reconfiguration, broader than redeployment, involves the retention, deletion, and addition of resources within firms. As shown by Karim (2006), business units entered by acquisition are divested sooner and reconfigured sooner than those entered by internal development.

[8]http://solutions.3m.com/wps/portal/3M/en_US/3M-ESPE-NA/dental-professionals/whats-new/press-releases/?PC_Z7_RJH9U52300FC40IQG8LGQL1JT0000000_assetId=1319221627816.

be usage-flexible if the costs to adapt them for use in alternative businesses in a firm's portfolio are low.

Illustrative examples

To illustrate the arguments about internal redeployment, consider two businesses that Procter & Gamble (P&G) entered in the late 1990s: Olay Cosmetics (an extension of the company's successful Olay skincare line) and Olestra (a fat substitute). Both were entered primarily through internal development by P&G, and both were subsequently judged as failures, yet their speed of exit differed substantially.

The usage-flexibility of firm-specific resources may explain why P&G quickly exited Olay Cosmetics in 2001, within two years after launch. In establishing Olay Cosmetics, P&G drew from facilities and skilled personnel that the company held in abundance, so the process of redeployment back into existing businesses was straightforward. For instance, Olay Cosmetics shared the same production plants and distribution center with P&G's Cover Girl and Max Factor units (*Baltimore Sun*, 1999). When P&G discontinued Olay Cosmetics, the firm could easily redeploy its people, production lines, and other resources to these more profitable brands.[9] Because of this ability to internally redeploy, the sunk costs of the Olay Cosmetics entry were largely limited to the $40 million expenses on advertising and promotion tied to product launch (and although this expense could not be recouped, it may have yielded some indirect benefit by building the general Olay brand). This example highlights how the potential for redeployment was high because P&G had multiple related alternative businesses.

The contrasting case of Olestra emphasizes how the usage-flexibility of resources is low when there are no next best alternatives in a company's portfolio of businesses. Olestra (a.k.a. the "fake fat") was developed through expenditures of $500 million over 25 years by P&G. After the U.S. Food and Drug Administration's approval in 1996, the company built a large factory in Cincinnati to produce Olestra. A synthetic compound of sugar and

vegetable oil that passes through the body without leaving any calories behind, Olestra was used in the preparation of traditionally high-fat foods such as potato chips (e.g., P&G's Pringles). The company anticipated other uses as well and had projected annual sales of $1 billion for Olestra as consumers became more health conscious. Following market introduction, Olestra fell far short of expectations, in part, because of accusations about digestive problems. The U.S. government required P&G to warn consumers with a label stating that consumption "may cause abdominal cramping and loose stools," and no governments outside the United States granted Olestra regulatory approval. The Cincinnati-based factory was reported to be operating at less than 50 percent of its originally planned capacity (*Wall Street Journal*, 2001). Absent markets for internal redeployment, P&G sold the Cincinnati-based Olestra factory to Twin Rivers Technologies in 2002 for a fraction of its original cost, and P&G exited.[10] P&G wrote down its $200 million investment in the plant, and the hundreds of millions that P&G expended on Olestra's development were essentially sunk costs.

Thus, P&G made a quick exit from Olay Cosmetics, where the company had ample opportunities for internal resource redeployment. By comparison, P&G faced an absence of internal redeployment opportunities with Olestra and persisted in efforts with the business for many years. While the Olestra business assets were ultimately divested externally, P&G recovered very little of its total investment. We suspect that the inability of P&G to recover much value from Olestra's assets internally or externally—that is, high sunk costs—may have contributed to the company's long delay in exiting the business.

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[9]A. G. Lafley, P&G''s chief executive, told analysts at the company's annual meeting in 2001 that P&G would focus its efforts on the more profitable Cover Girl and Max Factor brands for cosmetics (*New York Times*, 2001).

[10]P&G's slow exit from Olestra in the face of disappointing sales is consistent with the idea that despite negative signals about customer demand, exit will be delayed from new businesses in situations where sunk costs are high. Although P&G's large investment in R&D was essentially a sunk cost, the company persisted in trying to redeploy some of the technological knowledge it had acquired (*Cincinnati Enquirer*, 2002). Ultimately, this effort met with limited success, although after sale of the plant some of the knowledge was redeployed to new applications where Olestra was used as an eco-friendly alternative to petrochemicals, such as a lubricant for small power tools, an industrial lubricant, a base for deck stains, and a paint additive (*Scientific American*, 2009). However, these applications lie far from P&G's domain of consumer-packaged goods, so P&G could not leverage this knowledge easily. Similarly, P&G's large investment in the Olestra factory was mostly a sunk cost. Although terms of the sale of the plant were not made public, most of the original cost was written down by P&G.

THREE-PERIOD MODEL OF ENTRY AND EXIT

The above discussion and the P&G examples illustrate how greater potential for internal redeployment might increase the speed of exit in multi-business firms. Up until this point, the role of synergy has been ignored. Given that relatedness between businesses may increase both synergy and potential for redeployment, greater clarity around the two in our theory is needed. Below, we develop a three-period model to more formally examine how synergy and resource redeployment influence a firm's decisions to enter and subsequently exit from a business.

Model description

We assume that the firm is initially in an existing business or vector of businesses, V, and is considering whether to incur investment F to expand into a new business, B. If it chooses to enter, the firm later has three options: (1) stay in business B; (2) exit via divestment by selling B's resources in external markets; or (3) exit by internally redeploying resources from B to V.

Let synergy be represented by s, a multiplier of a business's cash flows epitomizing the benefits gained through the contemporaneous sharing of resources with a firm's other businesses. When $s > 1$, positive synergy obtains due to higher willingness-to-pay or economies of scope; when $s = 1$, no synergy obtains; and when $s < 1$, negative synergy obtains. The potential for redeployment is represented by r, and refers to the proportion of total investment, F, in the business that the firm is able to redeploy upon exit to other businesses inside the firm, $0 \geq r \geq 1$. When $r = 1$, the firm can redeploy all of F to its other businesses; and when $r = 0$, it is unable to redeploy any of F to its other businesses. We ignore cases where $r < 0$ (e.g., termination costs).

We assume that parameters s and r increase with relatedness between V and B, but they are determined by completely different processes: s derives from higher willingness-to-pay or economies of scope linked to simultaneously sharing the firm's resources across businesses V and B; while r derives from lower sunk costs associated with the option to redeploy resources rF to V.

Our model of entry and exit has potential cash flows over three time periods. In period 1, the firm

decides whether or not to enter the new business, based on expected profit. If it chooses to enter, the firm makes an investment in resources to establish and operate the business. Assume investment, F, is required to enter business B. In period 2, the firm generates cash flow sX_B from its new business, where X_B is a random variable with expected value $E(X_B)$ that is known prior to entry, and s captures the synergy between businesses V and B.[11] The firm observes the true returns from the business, and in period 3, it decides whether to remain in the business or exit. If the firm chooses to remain in B, it earns the same cash flow as in the prior period. If the firm chooses to exit, it can divest B, in which case it recovers a proportion, a, of the original investment, F, by selling the resources from B in the external markets. (Divesting B leads to loss of the cash flow from the business, including the part contributed by synergy between businesses V and B.) Alternatively, the firm can redeploy resources from B to V, in which case it recovers a proportion, r, of the original investment. To simplify the analysis, we do not apply any discounting to the cash flows.

If the potential to exit and recover part of the initial investment, F, is ignored, the entry decision is straightforward. Entry is warranted if the expected returns from the business in periods 2 and 3 exceed the initial investment cost.

$$\text{Enter } B \text{ if : } \left[-F + 2E\left(sX_B\right) \right] > 0 \qquad (1)$$

Consideration of the exit option through divestment or redeployment lowers the required threshold of expected profitability, making entry more likely.[12]

$$\text{Enter } B \text{ if : } \left\{ -F + E\left(sX_B\right) \right. \qquad (2)$$
$$\left. + E\left[\max\left(sX_B;\ aF;\ rF\right)\right] \right\} > 0.$$

In general, the period 3 options make entry more attractive. Even if $a = r = 0$, the firm can avoid losses in period 3 if the realized return, sX_B,

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[11] In practice, synergy may increase returns, reduce entry costs, or both. Although we take synergy as an increase in returns, the choice matters little in our model because the entry decision hinges on the relative values of F and sX. The degree of synergy is likely to be uncertain at the time of entry. Without loss of generality, we take s as the expected value of synergy and assign the uncertain component to X_B. We also assume that synergy operates only if X_B proves to be positive.

[12] For consistency with the real options literature, we also refer to the redeployment option as a switching option.

Table 1.   Determinants of *a* and *r*

Characteristics of the new business' resources	The potential for divestment, *a*, will be higher if:	The potential for redeployment, *r*, will be higher if:
Are the resources both firm-specific and usage-flexible?[a]	Resources are less firm or use specific	Resources are less use specific
Are there many potential users of the resources?	There are many external users that can buy the resources from the firm	There are many internal users such as the firm's other businesses
How much would it cost the potential users to adapt the resources?	The cost to adapt resources is lower for buyers	The cost to adapt resources is lower for a firm's other businesses
Can the potential users generate more profits with the resources?	Buyers can generate more profits relative to the business where the resources are currently used	A firm's other businesses can generate more profits relative to the business where the resources are currently used
Are the potential users larger than the existing user?	Buyers are larger in size relative to the business where the resources are currently used	A firm's other businesses are larger in size relative to the business where the resources are currently used

[a] The term *usage-flexibility* is purposely chosen in a way that is distinguished from *fungibility* and *redeployability*. We choose the term to emphasize that the potential for resource redeployment is a characteristics of the firm's product portfolio, and is endogenous. In contrast, *redeployability*, defined in Sakhartov and Folta (2014: second bullet point) as a property of a resource, is driven by factors that are fairly exogenous to the firm (e.g., [1] adjustment costs [driven by relatedness], [2] uncertainty, [3] correlation, and [4] differences in returns). So is fungibility, which is driven by the extent to which a resource is specialized (e.g., expertise in narrow scientific disciplines is a highly specialized resource, while cash is a highly fungible resource).

turns out to be negative. Higher values of *a* and *r* facilitate exit by allowing the firm to recoup more of its investment in the business if sX_B is lower than the alternative value of resources (aF or rF, whichever is larger). Put differently, rF is the internal opportunity cost of resources, and aF is the external opportunity cost. The firm stays in the market if the return exceeds both of these opportunity costs; otherwise, the firm exits and applies the resources elsewhere.

Linking Equation 2 to our discussion of relatedness, the likelihood of entry is an increasing function of synergy, *s*, and the potential for redeployment, *r*. Both effects are consistent with the view that relatedness leads to more entry, albeit, based on different mechanisms. Synergy enhances the expected return, while greater potential for redeployment lowers the threshold value of $E(sX_B)$ required to justify entry.

The likelihood of exit also depends on *r* and *s*, but their effects go in opposite directions. Following entry, the firm observes the actual value of sX_B in period 2. It decides in period 3 whether to: (1) stay in ***B***, (2) exit via divestment, or (3) exit via redeployment of resources from ***B*** to ***V***. Evaluating the cash flows of the alternatives gives the rule:

Exit ***B*** via *divestment* if : $sX_B < aF$ and $a > r$

Exit ***B*** via *redeployment* if : $sX_B < rF$ and $a < r$. (3)

This set of inequalities implies that the likelihood of staying in ***B*** increases with synergy, *s*, as predicted by the traditional resource-based view. The firm is more likely to exit from ***B*** when *r* is higher, indicating the initial investment, *F*, is more redeployable. Preference for divestment or redeployment is determined by the relative size of *a* and *r*. In Table 1, we speculate about the determinants of *a* and *r*, which lie beyond the scope of the model.

Results of entry and exit thresholds simulation

To illustrate insights from the model, we present in Table 2 simulation results under alternative assumptions about resource redeployment, *r*, and synergy, *s*. Given our focus on internal redeployment, all the examples in Table 2 assume that $r > a$, that is, redeployment dominates divestment as the mode

Table 2.   Simulation results based on the three-period model: total expected profit, likelihood of exit, and entry threshold under alternative assumptions about resource redeployment and synergy (assumed values shown in gray)

Case	Allow exit?	Synergy s	Resource redeployment r	Range of probability for sX distribution[a]		Likelihood of exit[b]	Expected cash flows by period			Total expected profit (three periods)
				Min	Max		Period 1 −F	Period 2 E(sX)	Period 3[c] E[max (sX, rF)]	
Cases 1–8: managers are not cognizant of the redeployment option at the time of entry										
#1	No	1.0		−1	2	**0**	−1.0	**0.50**	**0.50**	**0.00**
#2	Yes	1.0	0	−1	2	**33%**	−1.0	**0.50**	**0.67**	**0.17**
#3	Yes	1.0	0.5	−1	2	**50%**	−1.0	**0.50**	**0.88**	**0.38**
#4	Yes	1.0	1.0	−1	2	**67%**	−1.0	**0.50**	**1.17**	**0.67**
#5	No	1.5		−1	3	**0**	−1.0	**1.00**	**1.00**	**1.00**
#6	Yes	1.5	0	−1	3	**25%**	−1.0	**1.00**	**1.13**	**1.13**
#7	Yes	1.5	0.5	−1	3	**38%**	−1.0	**1.00**	**1.28**	**1.28**
#8	Yes	1.5	1.0	−1	3	**50%**	−1.0	**1.00**	**1.50**	**1.50**
Cases 9–14: managers are cognizant of the redeployment option at the time of entry										
#9	Yes	1.0	0	**−1.24**	2	**38%**	−1.0	**0.38**	**0.62**	0
#10	Yes	1.0	0.5	**−1.62**	2	**59%**	−1.0	**0.19**	**0.81**	0
#11	Yes	1.0	1	**−2.24**	2	**76%**	−1.0	**−0.12**	**1.12**	0
#12	Yes	1.5	0	**−2.61**	3	**46%**	−1.0	**0.20**	**0.80**	0
#13	Yes	1.5	0.5	**−3.04**	3	**59%**	−1.0	**−0.02**	**1.02**	0
#14	Yes	1.5	1	**−3.61**	3	**70%**	−1.0	**−0.30**	**1.30**	0

[a] Distribution of payoffs has a fixed range in Cases 1–8. In Cases 9–14, the minimum of the distribution shifted downward to the point where the firm becomes indifferent about entry. This sets the entry threshold.

[b] When sX follows the uniform distribution, U, the likelihood of exit is calculated by $\frac{rF - Umin}{U_{max} - U_{min}}$.

[c] When rF is a scalar and sX follows the uniform distribution, U, E[max(rF, sX)] is calculated by:

$$\left[\frac{rF - U_{min}}{U_{max} - U_{min}} \times rF \right] \times \left[\frac{U_{max} - rF}{U_{max} - U_{min}} \times \frac{rF + U_{max}}{2} \right]$$

.

Values in bold are computed by solving Equation 2, based on the assumed values (shown in gray) and the assumption that sX follows the uniform distribution.

of resource recovery. In all simulations, the initial investment, *F*, is set at 1.0.

We assume that the business's (initially) uncertain cash flows are randomly drawn from a uniform distribution. The upper and lower bounds of this distribution are varied across the simulations, as shown by the min and max values in the table. We portray the effects of the redeployment option under two types of assumptions about this distribution. In Cases 1–8, a fixed distribution for sX_B has been set with a mean return above the threshold required to justify entry. This assumption is used because anecdotal evidence accumulated through the interviews we conducted suggests that managers may not recognize the redeployment option at entry, but become cognizant of it after business performance declines. In Cases 9–14, managers are assumed to recognize the redeployment option at the time of entry, and

they adjust the entry threshold. This is characterized by a reduction in the minimum of the distribution to the point where the expected cash flow is just sufficient to induce entry.

Cases 1–8 illustrate how synergy and resource redeployment uniquely affect the exit decision. Cases 1–4 focus explicitly on redeployment by assuming no synergy (*s* = 1). In these four cases, the expected cash flow in period 2, $E(sX_B)$, equals 0.5 (the mean of the probability distribution, U[-1,2]). Case 1 is a base case where exit is not allowed. Given the initial investment of 1.0 and expected cash flows of 0.5 in each period, the total expected profit is zero. Cases 2–4 allow the firm to exit in period 3, with the redeployment parameter varied to show its effect. In Case 2, *r* = 0, so the firm is unable to redeploy any resources upon exit. Even so, there is extra value in having the option to exit, because if

the realization of sX_B falls below zero (i.e., below rF with $r = 0$), which will occur one-third of the time, the expected cash flow in period 3 is 0.67. Thus, the total expected return rises from zero in Case 1 to 0.17 in Case 2, and exit occurs one-third of the time. In Case 4, the firm is able to fully redeploy resources from the business ($r = 1$). Exit now occurs two-thirds of the time (when $sX_B < 1.0$), and the total expected profit rises to 0.67. Case 3, with $r = 0.5$, is intermediate.

These initial examples establish two main results. First, enabling the option to exit and raising the potential for redeployment enhance the total expected return from the business. Second, the likelihood of exit increases with the potential for redeployment.

Cases 5–8 illustrate the effects of positive synergy, holding other assumptions identical to Cases 1–4. We model synergy by extending the maximum of the probability distribution from 2.0 to 3.0. With synergy, the expected cash flow in period 2, $E(sX_B)$, increases to 1.0. Not surprisingly, the total expected profit from entry also increases, and the likelihood of exit is reduced. These arise within the model because with greater synergy (and a fixed lower limit on sX_B), more of the probability distribution lies above the point defined by rF.

The simulations in the bottom half of Table 2 explore how the entry threshold is influenced by the potential for redeployment. In these simulations, we assume that managers recognize prior to entry the additional value of the redeployment option, and they adjust the lower bound of the probability distribution to the point at which the firm is indifferent about entry. (Specifically, the lower bound falls to the point that makes the total expected profit over the three periods equal to zero. In effect, the redeployment option makes managers more willing to enter businesses that may prove less attractive.) Under this assumption, Cases 9–11 show the effects of changing the redeployment parameter, r, in the absence of synergy. Relative to Cases 2–4 discussed above, the probabilities of exit are higher, as might be expected given the downward shift in the distribution of sX_B. More interestingly, and consistent with Proposition 2, the entry threshold defined by $E(sX_B)$ falls as the potential for redeployment increases. Note, especially, Case 11, where $E(sX_B)$ is below zero, indicating that entry is justified even though the new business is expected to have negative cash flow. Entry is warranted with a negative expected return because if the business

performs poorly in period 2, the firm can exit the business in period 3, and efficiently redeploy its resources. In effect, the option to redeploy cuts off the tail of the sX_B distribution below rF. This incentive to enter businesses with negative expected returns can arise in our model because uncertainty is resolved following entry; it does not arise in Dixit's (1989) model, where the price of output follows a continuous random walk.

Generalizing beyond the model's simplified assumptions, the shorter the time until uncertainty is resolved and the longer the subsequent period over which profits can be earned, the more aggressive the firm can be about entering businesses with negative expected cash flows. If the option value associated with redeployment is large enough, there is no need for the expected profit of a given business to exceed the cost of capital. Over the long haul, the ability to retain and earn profits from businesses that turn out to be "winners" offsets losses from the "losers." This is analogous to the investment behavior of venture capitalists, who recognize that the vast majority of the businesses they support will fail to earn a positive return (e.g., Kerr, Nanda, and Rhodes-Kropf, 2014).

Cases 12–14 add the assumption of positive synergy ($s = 1.5$). Because synergy extends the upper part of the sX_B distribution, the lower end point shifts as well, so that total expected profit across the three periods equals zero. The addition of synergy leads to some patterns of interest. First, the entry threshold defined by $E(sX_B)$ is shifted downward. This is because the higher returns enabled by synergy allow the firm to be more aggressive in seeking new businesses. Thus, if managers recognize the potential to adjust the entry threshold in response to the potential for synergy and resource redeployment, the enhanced returns from synergy may be offset, in part, by riskier bets on businesses that may underperform. A second, related finding is that synergy does not necessarily reduce the likelihood of exit. In the context of the model, the introduction of synergy can decrease the likelihood of exit (Cases 9 and 12; $r = 0$), or increase it (Cases 11 and 14; $r = 1$) if the potential for redeployment is high. Again, this is consistent with Proposition 2.

How resource redeployment affects the speed of exit

The basic model illustrated above clarifies a theoretical basis for Propositions 1 and 2. It does not,

Table 3. Simulation results on how resource redeployment affects the speed of exit (assumed values shown in gray)

Case	Allow exit?	Synergy s	Resource redeployment r	Likelihood of exit Fraction of entries reversed via exit	Speed of exit Percentage of EXITS that occurred within:			
					Two years	Three years	Four years	Five years
#1	No	1.0						
#2	Yes	1.0	0	0.33	24%	52%	64%	70%
#3	Yes	1.0	0.5	0.50	66%	78%	84%	86%
#4	Yes	1.0	1.0	0.67	87%	91%	94%	94%
#5	No	1.5						
#6	Yes	1.5	0	0.25	0%	32%	52%	60%
#7	Yes	1.5	0.5	0.38	50%	66%	74%	79%
#8	Yes	1.5	1.0	0.50	76%	84%	88%	90%
#9	No	2.0						
#10	Yes	2.0	0	0.20	0%	15%	40%	50%
#11	Yes	2.0	0.5	0.30	33%	57%	67%	73%
#12	Yes	2.0	1.0	0.40	63%	75%	83%	85%
#13	No	2.5	--					
#14	Yes	2.5	0	0.17	0%	0%	24%	41%
#15	Yes	2.5	0.5	0.25	16%	44%	60%	68%
#16	Yes	2.5	1.0	0.33	52%	67%	76%	82%

however, help in diagnosing how the potential for redeployment might influence the *speed of exit*. In Appendix S1, we extend the basic model by repeating period 3's choices over multiple intervals in which the true value of sX_B is gradually revealed.[13] The results of this more dynamic simulation illustrated in Table 3 indicate that multi-business firms exit declining businesses faster when the potential for redeployment is greater. The last four columns in Table 3 compare the speed of exit by showing how fast the exits occurred. The speed of exit is measured as the percentage of exits that occurred within a certain number of "years" after entry, contingent on eventual exit. The rows in Table 3 present four sets of comparisons in total, where each set corresponds to a fixed level of synergy. Specifically, the upper two sets of comparisons (Cases 1–8) duplicate the parameter assumptions in Table 2, while the lower two sets of comparisons (Cases 9–16) extend the results by further increasing the levels of synergy.

In general, these simulation results show several patterns pertinent to our interest in distinguishing between synergy and resource redeployment.[14] First, the model reveals that the speed of exit increases when the potential for redeployment increases. This is most obvious when we compare cases having identical levels of synergy. For example, in the absence of synergy, Cases 2 and 4 reveal that the percentage of exits occurring within two years increases from 24 to 87 percent as *r* increases from 0 to 1.0. The same pattern of results holds in the presence of synergy. For example, Cases 14 and 16 show that the percentage of exits occurring within two years increases from 0 to 52 percent.

Second, the simulation results demonstrate that the speed of exit decreases with synergy. This insight comes from comparing cases with different synergy, but the same potential for redeployment. For instance, as synergy increases from 1.0 to 2.5, keeping the potential for redeployment at 1.0 (Cases 4 versus 16), the percentage of exits that occurred within two years after entry decreases from 87 to 52 percent.

In sum, it is clear from our model that the *speed* of exit decreases with synergy and increases with the potential for redeployment. Similarly, the *likelihood* of exit decreases with synergy and increases

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[13]Under Bayesian assumptions like those represented in Figure 1, the expectation of future cash flows is gradually revised downward in the face of evidence that the business is performing poorly. In such an extended model, the firm optimally exits as soon as the discounted present value of expected future cash flows falls below the opportunity cost defined by *rF* (or *aF*, if larger).

[14]The most obvious pattern is that the percentage of exits increases with length of time since entry, holding both the potential for redeployment and synergy constant. This is no surprise.

with the potential for redeployment (at least under assumptions where managers are myopic in their entry decisions). Given these predictions, in the section below, we look for empirical evidence in support of our theoretical expectations regarding the effects of redeployment.

Compounding our challenge is our inability to identify the extent to which firms follow corporate strategies around synergy or resource redeployment. Since both mechanisms create value with increasing relatedness, we can look for patterns of exit behavior across different degrees of relatedness. In our empirical evidence, we are able to observe the likelihood of exit and the speed of exit, both of which correspond to outcomes in our simulations. Given our prediction that the effects of synergy and resource redeployment offset each other, a finding that the likelihood of exit, or the speed of exit, or both, increase with relatedness would be suggestive of the presence of resource redeployment. However, if the synergy effect is dominant, we will only see the effect of synergy in our empirical evidence.

EMPIRICAL EVIDENCE

Relatedness and exit in the telecommunications and Internet sector

The empirical studies described at the start of this article provide some evidence on how relatedness affects exit. Even so, longitudinal information is scarce on how diversified firms enter new product markets, and subsequently, withdraw from them. In this section, we report some descriptive statistics on product market exit from a panel of 163 firms in the telecommunications and Internet sector sampled from the CorpTech "Who Makes What" directory. We tracked product market entries by the panel of firms between 1989 and 2001. From this sample of entries, we identified subsequent exits through 2003, our final year of observation. These statistics reveal patterns that are consistent with redeployment motives as well as conventional synergy explanations of exit.

In our analysis, entries are defined at the level of product code, which is more fine-grained than the four-digit SIC-based classifications or business unit classifications typically used in studies of diversification and market entry. One key advantage of this fine-grained approach is that we can more precisely measure relatedness between products, rather than capturing structural proximity due to products being in the same business unit or SIC code. We assess relatedness with a similarity index, following the approach of Jaffe (1986). For purposes of the tables below, two products (businesses) are categorized as related if they appear together in the product portfolios of multiple firms in the CorpTech directory.[15]

Entry is defined as the appearance of a new product code for the firm that persists in the directory for at least two years; *exit* is identified when that product code stops being listed in the firm's product portfolio for two consecutive years. As such, the entries and exits represent within-sector diversification and contraction, respectively, for firms active in the telecommunications and Internet sector.[16]

Tables 4 and 5 show how often and how quickly these firms exited the businesses they entered. A total of 1,575 entries into 608 product markets were at risk of exit, and remained at risk until they exited or until the end of the observation period.[17] It is apparent that exit is not a rare event. Among the 1,575 entries, there were 481 exits within the observation period (31%).

To consider how relatedness affects exit, we categorized the 1,575 entries according to the number of businesses the parent firm had that were related to the new business entered. The first category consists of new businesses that had no similarity with the parent firm's other businesses. The second category consists of new businesses that were similar to just one of the parent firm's other businesses. The third category consists of new businesses that were similar to two to four of the parent firm's other businesses; and the fourth category consists of new businesses that were similar to five or more of the parent firm's other businesses. As spelled out in our theory,

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[15] Jaffe (1986) developed a technology position index by measuring the extent to which patent classes co-occur in firm technology portfolios. Analysis not reported here considers alternative thresholds for identifying two businesses as related. Our findings in Tables 4 and 5 below are robust to alternative definitions and classifications of relatedness. See Lee and Lieberman (2010) for a detailed description of the methodology.

[16] We define *active* as having at least one product in the telecommunications and Internet sector over a period of nine consecutive years. Studying active firms ensures that we can observe many entry and exit events.

[17] The average firm in our risk set operated in 11 different markets and entered 10 new product markets over our sample period. The markets themselves vary greatly in density, from "satellite transmission/reception equipment" with only one firm in 1997 to "Internet storefront design services" with 4,772 firms in 2001.

Table 4.   Speed of exit as a function of number of RELATED businesses (CorpTech sample)

Number of *related* businesses	Number of entries	Number of subsequent exits	Fraction of entries reversed via exit[a]	Speed of exit			
				Percentage of EXITS that occurred within:			
				Two years	Three years[a]	Four years[a]	Five years[a]
Zero	305	141	0.46[b]	23%	43%[b]	55%[b]	68%[b]
One	300	90	0.30	21%	50%	69%	79%
Two to four	468	132	0.28	23%	59%	69%	76%
Five or more	502	118	0.24[b]	23%	66%[b]	82%[b]	92%[b]
Total	1,575	481	0.31				

[a] Differences among the four categories of relatedness are statistically significant at the 0.001 level, according to a test of differences between the four observed frequency distributions with a dichotomous classification (Chi-square test for consistency in a 4×2 table).
[b] Difference between the lowest ("zero") and highest ("five or more") categories is significant at the 0.001 level, according to a test of differences between the two observed frequency distributions with a dichotomous classification (Chi-square test for consistency in a 2×2 table).

Table 5.   Speed of exit as a function of number of UNRELATED businesses (CorpTech sample)

Number of *unrelated* businesses	Number of entries	Number of subsequent exits	Fraction of entries reversed via exit[a]	Speed of exit			
				Percentage of EXITS that occurred within:			
				Two years	Three years	Four Years	Five Years
Zero	31	5	0.16[b]	20%	80%	80%	80%
One	70	10	0.14	0%	50%	60%	80%
Two to four	234	35	0.15	29%	54%	60%	69%
Five or more							
Five to nine	365	101	0.28	21%	57%	70%	77%
Ten or more	875	330	0.38[b]	23%	53%	68%	79%
Total	1,575	481	0.31				

[a] Differences among the five categories are statistically significant at the 0.0001 level.
[b] Difference between the lowest ("zero") and highest ("10 or more") categories is significant at the 0.05 level. (Difference between the broader categories, "less than five" and "five or more," is significant at the 0.0001 level.)

as we move down these categories, it is expected that the potential for redeployment increases.

We expect the number of related businesses to capture both the benefits from synergy and the benefits from having a higher potential for redeployment. Table 4 shows a pattern where the fraction of entries reversed via exit falls as the number of related businesses increases.[18] This pattern on the *likelihood* of exit suggests that, in our sample, synergy has a stronger effect than redeployment. However, it does not rule out that redeployment was given important consideration during the exit decision.

In comparison, the pattern on the *speed* of exit in Table 4 gives evidence suggesting the existence of the potential for redeployment. Our simulation results in Table 3 indicate that exit becomes slower as synergy increases; in contrast, increasing the ability to redeploy speeds up the exit process. The latter is the statistically significant pattern we find in Table 4.[19] This pattern is supportive of Proposition 1; other things equal, the higher the potential for redeployment, the faster the exit.

More specifically, the last four columns in Table 4 compare the speed of exit across the four categories of relatedness by showing how fast the exits

[18]Differences among the four categories are significant statistically at the 0.0001 level, based on tests of differences among the four observed frequency distributions with a dichotomous classification (Chi-square test for consistency in a $K \times 2$ table).

[19]Differences among the four categories are significant statistically at the 0.001 level in years 3 and 5 and at the 0.0001 level in year 4, based on the Chi-square tests described in the previous footnote. Differences between the "zero" and "five or more" categories are significant at the 0.001 level in years 3, 4, and 5.

occurred (within two, three, four, and five years, respectively, of the date of entry).[20] In the second year after entry, the exits appear uniformly low across all four categories of relatedness. After year two, the exits increase dramatically, and the percentage of exits becomes strongly and positively linked to relatedness. This suggests that, after waiting two years for a new business to show its potential, firms with related businesses exited quickly if the business was performing poorly. The two-year probationary period seems reasonable and is consistent with the case example of Olay Cosmetics discussed earlier. By comparison, firms with no related business persisted in trying to maintain the new business.

The pattern in Table 4 with respect to the speed of exit could potentially be attributable to differences in firms' overall size or total number of businesses. To examine this possibility, we categorized the exits based on the count of *unrelated* businesses within each firm. The results of this classification, in Table 5, show no pattern with respect to speed of exit. Interestingly, the pattern for the likelihood of exit is the reverse of that in Table 4—exit was significantly more frequent in firms with more (than five) unrelated businesses. These results suggest that the findings in Table 4 linking the speed of exit to the number of related businesses cannot be explained on the basis of firm size.

So far, we have ignored the fact that firms enter new businesses through two principal modes: internal development and acquisition. The speed of exit is likely to differ between these modes. Karim (2006) demonstrates that on average, exits occur faster when businesses are acquired, as compared with businesses that are developed internally. Such a pattern is evident in our data as well; Table 6 distinguishes entries made by internal development from those made by acquisition.[21] The percentage of exits that occurred within the first two years is roughly three times higher for acquisition entries as compared with the internal development entries.

More generally, Table 6 examines whether the effects of business relatedness on the speed of exit may depend on the mode of entry. Panel A of Table 6

shows that for entries made by internal development, the speed of exit increased with business relatedness. Indeed, this pattern appears stronger in Panel A than for the full sample in Table 4. In contrast, little or no connection between relatedness and speed of exit can be seen for the acquired businesses. As shown in Panel B of Table 6, of the acquisitions that were subsequently exited by firms in our sample, nearly half were abandoned by the end of year two. Moreover, the temporal pattern in Panel B is highly mixed across the categories of relatedness, and the tests for differences in speed of exit among the four categories of relatedness fail to reach minimal levels of statistical significance.

Thus, Proposition 1 is consistent with the pattern observed in the internal development sample but not with the pattern in the sample of entries made by acquisition. This suggests that the mechanism proposed in this article applies most intensively to entries made via internal development. An explanation may be that recent acquisitions often face a comparatively strong external market for resale of the business, whereas it is much more difficult to sell unprofitable, immature businesses that have been developed internally. Hence, it seems likely that $a > r$ for many acquisitions; whereas for internally developed entries, typically, $r > a$, as required for internal redeployment to be the dominant mechanism. In any case, Table 6 suggests that mode of entry moderates the effects of business relatedness on the speed of exit, and our theory of redeployment and exit seems most applicable to internally developed businesses.

DISCUSSION

At the heart of this article is the potential for resource redeployment—a firm's capacity to efficiently transfer physical, human, intellectual, and organizational resources within the firm—that Penrose (1959), Chandler (1962), and Helfat and Eisenhardt (2004) suggest is a key engine for corporate evolution. Because resources are the source of a company's value creation and are often firm-specific, when businesses perform poorly it is not always optimal to liquidate them in the external market, where the company might extract only a fraction of its value. A superior approach may be to use the firm's internal market to redeploy resources elsewhere inside the firm. One important implication is that the potential for redeployment

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[20] Our sample has no exits within one year of entry, as we excluded businesses that appeared in the firm's product portfolio for only a single year to avoid possible miscodings.

[21] Mode of entry was coded as acquisition if the product class the firm entered could be traced to the product portfolio of an incumbent that was acquired by the firm prior to entry.

Table 6.   Speed of exit as a function of business relatedness and mode of entry (CorpTech sample)

Number of related businesses	Number of entries	Number of subsequent exits	Fraction of entries reversed via exit[a]	Speed of exit			
				Percentage of EXITS that occurred within:			
				Two years	Three years[b]	Four years[a]	Five years[a]
A:Mode of Entry = Internal Development							
Zero	241	106	0.44[c]	19%	35%[c]	49%[c]	62%[c]
One	243	69	0.28	13%	41%	62%	74%
Two to four	361	84	0.23	14%	51%	67%	75%
Five or more	356	87	0.24[c]	11%	61%[c]	79%[c]	91%[c]
Total	1,201	346	0.29				
B: Mode of Entry = Acquisition							
Zero	64	35	0.55[c]	34%	66%	71%	86%
One	57	21	0.37	48%	81%	90%	95%
Two to four	107	48	0.45	40%	73%	73%	77%
Five or more	146	31	0.21[c]	55%	81%	90%	94%
Total	374	135	0.36				

[a] In the internal development sample, differences among the four categories of relatedness are statistically significant at the 0.001 level.
[b] In the internal development sample, differences among the four categories of relatedness are statistically significant at the 0.01 level.
[c] Difference between the lowest ("zero") and highest ("five or more") categories is significant at the 0.001 level.

should induce earlier exit from poorly performing businesses. A more general implication is that it might be useful to think of related diversification as a process conducive for experimenting for uses of resources in new businesses.[22]

Broadly speaking, these ideas about internal resource markets help to generalize the theory of internal capital markets. Extant research has considered many implications of resource redeployment on diversification (Helfat and Eisenhardt, 2004), covering firm value (Sakhartov and Folta, 2014), growth opportunities (Sakhartov and Folta, 2015), and acquisitions (Anand and Singh, 1997). Our theory, which emphasizes the flexibility offered by resource redeployment, helps to develop this perspective in the diversification literature. Firms may consider entering related businesses not merely as an avenue to seek economies of scope, but also as a low-cost experiment providing an easy path for retreat. The potential for redeployment implies that resources will not be stranded if a risky diversification move performs poorly. As such, the ability to redeploy resources internally among related businesses affects not only exit decisions, but also entry decisions for firms that understand the dynamic

logic. That is, relatedness influences the optimal thresholds for both entry and exit.

This article is the first to demonstrate how resource redeployment affects entry and exit by multi-business firms.[23] We have built on the call by Helfat and Eisenhardt (2004: 1,217) to move beyond static considerations of "contemporaneous sharing" and better attend to the benefits a firm can derive from "redeployment of firm resources between businesses over time." In contrast with Helfat and Eisenhardt's emphasis on resource redeployment from a retiring business to a new business, our emphasis is on resource redeployment from a new business to the firm's other businesses. Even so, the flexibility offered by resource redeployment should apply in both directions.

Our theory also contributes to the resource-based view of the firm. The resource-based view has traditionally emphasized that relatedness enhances the survival of a new business because of synergy. By contrast, our theory emphasizes how relatedness encourages exit in the presence of resource redeployment. Corporations with more related businesses may indeed perform better, but they should also require higher performance to persist in a business since they can more easily redeploy resources

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[22]Matsusaka (2001), and Bernardo and Chowdhry (2002) also considered diversification as a form of experimentation, although in their models, firms diversify to learn about their own ability. They do not emphasize related diversification.

[23]Helfat and Eisenhardt (2004) emphasize entry and re-entry costs, but do not stress the importance of sunk costs. Neither do they emphasize how sunk costs affect exit.

internally. This explanation of how relatedness affects exit by altering a firm's performance threshold is different from the typical emphasis on how relatedness affects performance.

The theory we develop is complementary to the work of Levinthal and Wu (2010), and Wu (2013) who emphasize that certain resources (e.g., employees, equipment, plants) are largely "nonscale free" in that their use in one business precludes their simultaneous use in alternative businesses. It is the fact that resources are "nonscale free" which induces consideration of redeployment. Specifically, the potential for redeployment derives from lower sunk costs associated with the option to redeploy nonscale free resources. By contrast, synergy derives from economies of scope linked to simultaneously sharing the firm's "scale free" resources.

Our focus on redeployment also builds on Sakhartov and Folta (2014), who use real options pricing techniques to emphasize how re-entry costs in alternative markets influence the value of resources in a two-business firm. We expand these real options considerations for firms beyond two businesses, develop theory around entry and exit decisions, and provide empirical evidence consistent with our theory. We have speculated about when exit through redeployment might be more attractive than exit through divestment, but clearly, future work should dig more deeply into this.

Our theory is also complementary to an important literature on resource reconfiguration subsequent to acquisition (Capron, 1999; Capron, Dussauge, and Mitchell, 1998; Karim, 2006; Karim and Mitchell, 2000). This literature has usefully analyzed what types of resources are retained versus divested, how firms use acquisitions to deepen and extend resources, how post-acquisition redeployment of resources affects long-term acquisition performance, as well as how acquired resources versus those that are developed within the firm are reconfigured. Together, these studies suggest useful ways of extending our arguments and analysis. We have compared internal redeployment to external divestment, and explored restrictively the two most common modes of market entry, internal development and acquisition. Nevertheless, we have merely sketched out the main features of the redeployment process.[24] Future work might consider in much

greater detail how processes of post-acquisition reconfiguration can bundle resources from acquired businesses in a way such that they can be efficiently redeployed to a firm's other businesses through the firm's internal market of resources.

Another extension is to consider inter-organizational contracts such as joint ventures and strategic alliances. These contracts are typically promoted as arrangements for partner firms to leverage their distinctive resources and capabilities, as suggested by the resource-based view. Less commonly recognized is the fact that joint ventures and alliances allow firms to enter new businesses in a way that minimizes sunk costs. If our theory is correct, poor-performing joint ventures and alliances will be terminated faster when resources can be more easily redeployed back to the contributing partners. In addition, contracting for resource use provides an external market mechanism that is an alternative to divestment. Our theory can be extended to predict the determinants of internal redeployment versus divestment and inter-organizational contracting for resource use.

Limitations

In support of our theory, we have provided several types of evidence: logical arguments, modeling and simulation, case studies, and empirical data. All have limitations. For example, the case examples of Olestra and Olay are merely illustrative. The fact that these two businesses differed greatly in size might suggest alternative explanations that we do not rule out. We have also provided evidence on how redeployment might bear on firm contraction decisions in the telecommunications and Internet sector. However, we do not observe firm-specific performance in each of the businesses, nor do we directly observe the movements of resources. The results of our simulation model have similar limitations. While none of the pieces of evidence we have presented are completely satisfactory, they point to a consistent picture on how the potential for redeployment influences exit.

The main gaps in our study, which can be filled by future research, are to show the details of how resources are redeployed, and related performance outcomes. Moreover, research is also needed to

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[24] We thank an anonymous reviewer for suggesting that a 2×2 between entry mode (internal development versus acquisition)

and exit mode (internal versus external resource market) would provide a helpful framework for further exploring issues relating to resource redeployment.

diagnose the extent to which resource redeployment bears upon exit. This is a very challenging task, on several dimensions. First, resource redeployment is difficult to observe, and even if it is possible to ascertain whether firms redeploy resources from one business to another, it is usually difficult to understand which resources are redeployed versus left idle. Second, a lack of redeployment does not necessarily imply that firms do not benefit from having the potential for resource redeployment—that potential, even if unexercised, provides managerial flexibility. Third, a key determinant of the potential to redeploy is relatedness, but relatedness is the same factor that drives synergy. A pure focus on relatedness is problematic because it aggregates both effects, and thus, measures of relatedness can be hard to interpret in a regression-type analysis. Our findings on the speed of exit suggest one route to teasing out these effects, but future work should consider alternative ways to separately measure the effects of redeployment and synergy.

Another limitation is that our theory assumes managers are rational in decision-making. It is well known that in making exit decisions, managers are often subject to cognitive and behavioral biases that can be quite severe (Adner and Levinthal, 2004; Elfenbein and Knott, 2015). One issue that remains to be explored is the extent to which managers recognize the implications of the perspective we lay out in this article. The limited empirical evidence we present suggests that managers do respond to the incentives for faster exit when the potential for redeployment is higher. Whether they also understand the incentives for greater experimentation is an open question. Most companies have processes and tools in place for reallocating financial resources across businesses. We suspect, however, that they often lack the counterpart for redeploying the types of value-creating resources that we focus on in this article. Therefore, from a managerial standpoint, our study aims toward the development of better internal processes for resource redeployment and experimentation.

Managerial implications

Our perspective has further managerial implications. As noted above, we suspect that most managers may not fully understand the potential for redeployment, particularly the subtle implications on earlier stages of decision-making about entry

threshold, entry mode, and diversification strategy. While the executives we interviewed acknowledge the role of resource redeployment in affecting exit decisions, they do not seem to recognize the importance of resource redeployment *in designing entry*.

Indeed, a major theme of our study is that entry and exit should be jointly considered. Market entry is commonly understood to be a risky endeavor—most entry attempts ultimately end in failure (Agarwal and Audretsch, 2001; Dunne, Roberts, and Samuelson, 1989; Geroski, 1995; Mata, Portugal, and Guimaraes, 1995). Given this fact, exit options should always be assessed when making entry decisions. Venture capitalists carefully evaluate modes of exit when they fund a business; we argue that the same should apply for managers considering new ventures within established firms. New businesses should be designed to facilitate internal redeployment or outside sale, in the event that the business performs poorly. Furthermore, the potential for redeployment should be taken into account when setting the level of expected profitability needed to justify entry. If redeployment is easy, managers can safely experiment and take greater risks with entry. On the other hand, if redeployment is likely to be difficult or costly, managers should be very cautious about entering.

Firms that have pursued a strategy of related diversification via internal development are likely to be well positioned to experiment with risky entry within their primary sector. However, simply being diversified may not be sufficient—managers must create a vibrant internal market for resources. For redeployment to provide the most value, particularly within large firms, it is important that resources do not become organizationally imprisoned within subunits.

CONCLUSION

Researchers in corporate strategy have long argued that resource relatedness contributes to a firm's competitive advantage by promoting economies of scope or "synergy." One implication is that entries made by a firm into businesses that are more related to the firm's existing businesses are likely to survive longer than similar entries made into less related businesses. We have offered a contrasting view in which relatedness increases the speed of exit: Relatedness facilitates the internal redeployment

of resources, which justifies the undertaking of riskier entries and greater experimentation by the firm. Although we have presented some supporting empirical evidence, much remains to be explained in future work.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix S1. Extended multi-period model