WHEN TO BURN YOUR SHIPS:

THE FLEXIBILITY-COMMITMENT TRADEOFF IN RESOURCE REDEPLOYMENT

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ABSTRACT

The ability of multi-business firms to redeploy resources across businesses is a principal source of corporate advantage, as evidenced by a plethora of theoretical and empirical research. However, extant theory is silent in clarifying how resource redeployment might impact competitive behavior of rivals. Redeployability reduces irreversible commitments, which have long been recognized to deter rivalry, allow privileged access to scarce resources, and sustain a valuable strategic position. This raises a tension between the flexibility advantages and potential commitment disadvantages from redeployability. Using a dynamic computational model, we explore the competitive conditions under which redeployability can be advantageous or detrimental to long-term firm value. In addition to enhancing our understanding of the boundary conditions around resource redeployability, this study also has implications for real option models and the broader dynamic capabilities literature.

Keywords: Corporate strategy, Competitive dynamics, Resource redeployment, Dynamic capabilities, Markov models

1 INTRODUCTION

Diversified firms play an important role in developed economies around the world, and whether they are warranted is a fundamental issue in strategic management. The construct usually used to assess whether a firm should be diversified is corporate advantage—whether a diversified firm creates more value than its individual businesses could generate if they were not part of the corporate parent (i.e., if they were focused). The dominant theory explaining corporate advantage has been synergy, or intra-temporal economies of scope (Helfat and Eisenhardt, 2004), where resources are shared simultaneously across businesses. An emergent explanation of corporate advantage, one emphasizing inter-temporal economies of scope (Helfat and Eisenhard, 2004) or resource redeployability (Sakhartov and Folta, 2014), where resources might be flexibly withdrawn and redeployed across businesses, suggests diversified firms may be able to more efficiently expand and retrench from opportunities relative to more focused rivals confined to using external markets (Dickler and Folta, 2020), while also facilitating quicker exit from markets (Lieberman, Lee, and Folta, 2017; Sohl and Folta, 2021). Consistent with this theory, Dickler, Folta, Giarratana, and Santaló (2022) find that corporate advantage is enhanced in the presence of more uncertainty, seemingly due to the added flexibility of diversified firms to exploit good opportunities and retrench from bad ones.

Flexibility must not always be advantageous, however. Indeed, a rich literature emanating from economics suggests commitment may be beneficial because it credibly signals likely behavior to rivals. As such, it is not obvious that greater resource redeployability should always lead to corporate advantage, if rivals escalate aggressive pursuit of a market because they recognize their flexible counterparts can efficiently vacate markets. Sakhartov and Folta (2014) emphasize that irreversible commitments are lowered by having an ability to redeploy resources. It stands to

reason that lower commitment may adversely affect a firm's competitive position. Understanding how commitment alters the boundary conditions of this emergent theory will inform our understanding of corporate advantage. Doing so, however, requires an understanding of how resource redeployment alters the competitive behavior of rivals. We develop a model which endogenizes competition, to illuminate when diversification leads to corporate advantage or disadvantage.

This paper explores whether redeployability might put a firm at a disadvantage if it cannot credibly commit to a market. Using a dynamic model that enables joint consideration of competitive interaction and switching option value tied to redeployability, this paper attempts to reconcile the tension between corporate flexibility and commitment that is largely absent from the literature on resource redeployment. A number of interesting results emerge from the model. Under low and intermediate competition, resource redeployability nearly always leads to greater corporate advantage, as implied in the prior literature. However, under higher competition redeployability can lead to corporate disadvantage. These aggregate effects are shown to be a function of how competition independently and jointly affects primary determinants of resource redeployability found in the literature. For three reasons we eventually introduce synergy into our model. First, engaging the two primary ways resources might lead to corporate advantage gives us a more comprehensive view of how competition affects the corporate scope decision. Second, some firms may pursue both synergy and redeployability, so understanding how competition may affect their joint impact is important. Finally, dis-synergy might create an opportunity cost to scope expansion.

The results suggest boundary conditions for a theory of corporate advantage around resource redeployability, going beyond prior literature emphasizing uncertainty, redeployment

costs, external transaction costs, and inducements. Even if current empirical evidence suggests benefits to resource redeployment, we show that the benefits are tempered by competition, or bounded by the competitive environment.

In addition to enhancing our understanding of the boundary conditions around resource redeployability, our paper contributes in two other ways. First, to the extent that redeployability represents a dynamic capability, our paper speaks to that broader literature emphasizing the type of organizational "agility" enabling firms to seize opportunities as internal and external environments undergo rapid changes (e.g., Helfat et al., 2007; Teece, 2007; Teece, Peteraf, & Leih, 2016). Adaptability may have a downside. Capabilities emphasizing adaptability may been seen by rivals as lacking commitment, exposing them to rivals recognizing it. A second contribution is to the real option literature. While others examine the tension between flexibility and commitment in the option to wait, no prior work has explored this tension in the switching option so pertinent in corporate strategy and attempts to derive value from fungible resource portfolios. Both contributions are further elaborated in the Discussion.

2 LITERATURE REVIEW

Understanding how competition affects the decision to pursue diversification or focus requires a glimpse of the redeployment and competitive commitment literatures.

2.1 Redeployability and Competition

It is increasingly recognized that having the potential to redeploy resources across businesses might be a source of corporate advantage (e.g., Helfat and Eisenhardt, 2004; Sakhartov and Folta, 2014; Dickler et al., 2022). The literature contrasts resource redeployability with actual redeployment, where the former represents a switching option taking on value under uncertainty

(Bernardo & Chowdhry, 2002; Sakhartov and Folta, 2014).[1] It unambiguously stresses that in the presence of uncertainty, redeployability should enhance firm ability to compete with rivals, and there is evidence consistent with this thesis (Dickler, Folta, Giarratana, and Santalo, 2022). Emphasis has been on comparing firms with more redeployability to firms with less, rather than on explaining how redeployability might affect the competitive behavior of rivals. For example, Lieberman and co-authors (2017) argue that firms with more-related portfolio businesses should exit sooner from those businesses because their resources can be reallocated to their other portfolio businesses at low adjustment costs. Sohl and Folta (2021) provide empirical support for these claims. Both papers explicitly compare more-related firms with less-related firms, without giving consideration to how competitive behavior may emerge as a result of rivals having divergent degrees of redeployability. Another example is Belenzon and Tsolmon (2016), who show that group-affiliated businesses perform better than other businesses in geographies with labor market frictions (i.e., high external transaction costs), presumably because of their stronger internal labor markets. While not an exhaustive review, it is representative of a wider set of papers failing to consider competitive responses to redeployability.

One paper giving some consideration to competition is Giarratana and Santaló (2020), studying allocation of shelf space in the beverage industry. They find that multi-niche firms facing adverse demand shocks in a particular product niche (e.g., increasing taxes on beer), are likely to reallocate their shelf space *away* to other unaffected niches, especially when the structure of the

[1] Resource redeployability has been referred to as "inter-temporal economies of scope" by Helfat and Eisenhardt (2004) and as "redeployability" by Sakhartov and Folta (2014). Actual redeployment represents the exercise of the switching option, and generally requires resource adjustment costs. These costs represent an irreversible investment, and if they are less than external transaction costs the option exercise decision is valuable. Redeployment does not exhaust the switching option because it is possible to redeploy resources back to their original use.

downstream buyer industry is concentrated. In this sense, less competitive markets may create an inducement to redeploy.

In summary, redeployment is viewed as an alternative to the purchase or sale of resources in external markets. There is compelling evidence that redeployability creates advantages for multi-business firms relative to single business firms in performance (e.g., Dickler et al., 2022), and the ability for strategic change (e.g., Wu, 2013; Belenzon and Tsolman, 2016; Dickler and Folta, 2020; Sohl and Folta, 2021), sometimes by at least temporarily "escaping" competition until conditions are more favorable (Giarratana and Santaló, 2020). What has not received attention is whether a potential to redeploy has strategic implications on competitor behavior. As such, the literature seems to be either largely agnostic about competitive forces, or study resource redeployment under the condition of "benign competition". It is unclear whether the theory's predictions hold or need adaptation after considering how redeployability influences competition, and how competition influences the corporate advantage derivable from redeployability.

2.2 Focus and Competition

In contrast to the redeployment literature, competition plays a central role in illuminating benefits to focus. Focused firms can be viewed as being committed to a market through a set of specific investments developing a set of capabilities superior to rivals. Ghemawat (1991) defines commitment as the tendency for a strategy choice to persist over time. Commitments are costly and hard to reverse which makes them credible, and if they did not exist firms could easily change strategies. "An action that can be changed loses strategic affect against a rival who thinks strategically" (Dixit and Nalebuff, 1993: 142). Most relevant for this study, commitment may deter profit-eroding imitation by rivals, or more generally deter attacks by rivals (Schelling, 1960). Military history provides illustrative examples in this regard. In his book "Art of War" Chinese

military general Sun Tzu (6^{th}-5^{th} century B.C.) taught armies to burn their ships behind them as they advanced into new territory. Similarly, Spanish Conquistador Hernán Cortés ordered nine out of his twelve ships to be destroyed in an effort to change the Aztec's expectations about how hard his men would fight. Focused firms are credibly committed to their market because they have invested exclusively in a market—they have metaphorically burned alternative ships behind them.

Focus has benefits beyond being a credible commitment. Compared to diversified firms, focused firms might avoid coordination costs necessary to extract synergy (Teece, 1980, 1982; Jones and Hill, 1988; Williamson, 1975, 1985).[2] Recent work suggests that coordination costs make adaptation difficult (Natividad and Rawley, 2016; Chen, Kaul, and Wu, 2019). Chen, Kaul, and Wu (2019) speculate that coordination costs might also hamper resource redeployment. In general, it is believed that firm focus facilitates organizational and incentive alignment to better pursue firm goals (Jensen and Meckling, 1976).

2.3 Summary

Because greater redeployability may imply less credible commitment, multi-business firms having it may be quicker to exit markets, making them subject to more competitive attack and lower corporate advantage. Thus, it is crucial to consider whether and when these potential negative effects offset any gains from resource redeployability. Moreover, doing so in a formal way is appropriate because calibrating interdependent effects of redeployability and credible commitment is not obvious through informal reasoning. The next section introduces a formal model to examine whether and how the benefits of resource redeployability are tempered by competition, or bounded by the competitive environment.

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[2] These coordination costs might include costs of communication and information transfer (Jones and Hill, 1988; Zhou, 2011), costs of incentive degradation (Hill and Hoskisson, 1987; Hoskisson, Hitt, and Hill, 1991; Williamson, 1985), influence activities (Milgrom and Roberts, 1988); and agency (Amihud and Lev, 1981).

3 MODEL

Formal models of resource redeployment in the strategic management literature usually have been based on the real option framework (Sakhartov and Folta, 2014, 2015; Sakhartov, 2018). In these models, a diversified firm has a switching option—the opportunity to redeploy a resource from one market to another. The value of this option stems from the *ex-ante* uncertainty in market attractiveness across the firm's portfolio of businesses. The switching option takes on more value if business opportunities are more likely to diverge at some point in the future. Greater divergence creates an inducement to redeploy the resource to the more attractive opportunity. Real option models implement a forward-looking analysis, evaluating the payoff to redeployment against the possibility that the redeployment might be costly to reverse in the future.

While real options models are suitable for examining whether a firm benefits from redeploying across markets, they are ill-suited for investigating the effect of oligopolistic competition on the value of redeployment, where capturing the dynamics of multiple firms competing with one another is fundamental. In many cases, market attractiveness should be determined by whether rivals decide to participate in a market; and rival decisions should be determined by how vulnerable they perceive a focal firm to be; which the focal firm should consider when making their own decisions about where to compete; and so on. Real option models are not designed to incorporate such infinite regress. Thus, for this study we need a modeling framework that incorporates not only uncertainty and dynamics (as real option models do), but also oligopolistic competition.

Markov perfect equilibrium (MPE) models incorporate all the three elements we require: dynamics, uncertainty, and competition (Wibbens, 2023). These models were introduced in industrial organization economics to describe industry dynamics with uncertainty (Ericson and

Pakes, 1995), and have recently been employed in the strategy literature to model resource dynamics under uncertainty (Wibbens, 2021, 2023). Here, the model is extended to study resource redeployment under oligopolistic competition.

The model is kept deliberately parsimonious. MPE models might become very complicated when incorporating firm decisions over time under uncertainty and competition, making them difficult to comprehend. They might also become unstable, in the sense that a solution cannot be easily computed or yields unexplainably large differences in results for similar parameter combinations. Therefore, the setup is kept as simple as possible, while capturing the essence of redeployment dynamics under competition.

Similar to Wibbens (2021), two firms compete for a single type of resources needed for production, so each period they decide whether (and to what extent) to expand or retrench from a market. Our model differs from Wibbens (2021) in that the firms may be diversified. Focused firms can only use external markets to acquire or divest resources, while diversified firms can additionally use internal markets to redeploy resources across markets (for reasons of parsimony, we do not model these other markets explicitly). Firms make acquisition, divestiture, and redeployment decisions such that they optimize net present value (NPV). Thus, the model is designed to incorporate not only short-term profit considerations, but also long-term strategic effects, such as commitment. These strategic effects result endogenously from firms' NPV-optimizing expansion and retrenchment decisions.

At any given time t, product market competition determines firm profits in that market, π_1 and π_2. These profits are a function of firms' resource levels in the focal market, x_1 and x_2. Over time, each firm decides its level of expansion (or retrenchment) effort y in the focal market. The higher this effort, the faster it can gain (or shed) resources Δx at a later time $t + \Delta t$. This process is

probabilistic. The higher the effort *y*, the greater the probability of gaining (shedding) a resource in the next period. Each Firm *i* sets its effort level y_i such that it optimizes its NPV, the sum of all future discounted expected cash flows. This process is repeated indefinitely: the model has an infinite horizon.

Incorporating inherent uncertainty, the model provides a probabilistic description of the industry evolution. The equilibrium (MPE) determines the optimal effort levels y_i levels for each combination of resource positions x_1 and x_2. Given an initial industry state (x_1, x_2) the model thus yields a probability distribution over all potential future paths of industry states.

Note that while in traditional economic models, such as Cournot or Bertrand, an equilibrium specifies a static market, this is not the case in MPE models. Rather, an equilibrium specifies the so-called "policy function", which describe firms' effort decisions as a function of the resource states. Given a focal firm's resource level x_1 and its competitor's x_2, the policy function describes the effort y_1 to gain (or shed) resources. The equilibrium condition is met when Firm 1's policy is optimal (i.e., y_1 optimizes NPV) given Firm 2's policy, and vice versa.

The equilibrium policy functions determine the probability distribution over all potential paths of the industry evolution. In equilibrium, the industry state (x_1, x_2) determines the effort levels y_1 and y_2. In turn, the effort levels determine the probability distribution over future states. This process continues indefinitely and as a result the industry will continue to change. Thus, an MPE model does not yield a static industry outcome.

Insert Figure 1 about here

Figure 1 provides a schematic overview of the model dynamics, where two parts are indicated. The first part of the model details *product market competition*, specifying profits π_i as a function of resource positions x_i. The second part of model describes the *resource dynamics*,

specifying resource evolution as a function of the expansion and retrenchment effort y_i. The details for each model part are discussed in the next sections. The full formal model specification is relegated to Appendix A.

3.1 Product market competition

While the focus of this paper is on how resource dynamics affect profitability, a starting point is clarifying how product market competition functions. Because the product market is not the paper's main focus, we keep its implementation deliberately simple.

The model allows for varying levels of competitiveness. The ability to specify a low level of competitiveness aids an ability to compare our model results to prior empirical findings, which were based on markets lacking competitive interaction. Adding higher levels of competitiveness enables the study of oligopolistic competition on redeployment. The definition of competitiveness that we use is akin to Porter's (1980) concept of rivalry:

> **Definition**. ***Competitiveness*** *is the extent to which firm actions in a product market negatively affect competitor profits in that market. Under high competitiveness, firm actions lead to a strong decrease in competitor profit. Under low competitiveness, this effect is small.*

To formalize this definition of competitiveness, a competitiveness parameter α is specified, which represents the level of product differentiation, as product heterogeneity is a key source of competitive rivalry (Porter 1980). A high level of differentiation between the two firms' products implies that Firm 1's demand is hardly affected by that of Firm 2, and vice versa. This situation represents low competitiveness α. Conversely, a low level of product differentiation represents

high competitiveness α. The parameter α can vary between zero (perfect differentiation, no direct competition) and one (no differentiation, maximum direct competition).

Since resources in the model represent productive assets, a firm's resource level x is a measure of production capacity. The more resources a firm has, the more customers it can potentially serve, and the higher its potential to generate profits. Thus, the variable x represents non-scale free resources, which carry an opportunity cost (Levinthal and Wu, 2010). This is consistent with prior literature, because only non-scale free resources should be redeployed (Sakhartov and Folta, 2014).[3]

The product market is modeled using the framework of value-based strategy (VBS; Brandenburger and Stuart, 1996; Gans and Ryall, 2017), where profits are equated with added value—a firm's value creation beyond the level that other market actors can create. This is a common setup in the strategy literature to model product market competition (e.g., Adner and Zemsky, 2006).

Specifically, a market with many customers is assumed, and each customer has a demand for at most one product from a firm. As is common in the economics literature, demand, and thus value creation, decreases linearly, from some initial level $vc_0 > 0$ to zero. Customers have demand for products of up to Q productive resources. Thus, a firm with $x = Q$ productive resources serves the entire market.[4]

[3] By contrast, scale-free resources—such as brands and patents—do not need to be redeployed. They can be used in multiple businesses at the same time without opportunity cost.

[4] The specific level of the parameters Q and vc_0 is not very relevant for our results and can simply be set to convenient numbers (we use $Q = 5$ and $vc_0 = 10$). If, for instance, one were to multiply the parameter vc_0 by ten, all values would increase tenfold, leaving their relative levels unchanged. Because we are only interested in relative values, we can thus freely choose vc_0 "without loss of generality" (as economists say).

Insert Figure 2 about here

Figure 2 shows the resulting profit for Firm 1 as a function of each firm's resources x_1 and x_2. The three charts represent the profit outcome for low ($\alpha = 0.2$), intermediate ($\alpha = 0.5$), and high ($\alpha = 0.8$) competitiveness. More resources x_1 always lead to higher profits π_1, with diminishing returns. Each additional resource yields lower additional profits, because the more a firm produces, the lower the value creation for the marginal customer. Moreover, under high competitiveness ($\alpha = 0.8$), the competitor's resources x_2 strongly diminish the focal firm's profit π_1, while under low competitiveness ($\alpha = 0.2$) they have little effect on it. Thus, the competitiveness parameter formally captures the earlier conceptual definition. Appendix A provides formal derivations of these results.

3.2 Resource dynamics

The resource dynamics part of the model describes how firms decide to expand or retrench in a market (see Figure 1)—through external markets via acquisition or divestment, or through internal markets via redeployment. The decision is based on observed resource positions x_1 and x_2. Changes in resource positions are determined by a firm's effort level y, and its expansion/retrenchment capability a. The expected speed of gaining or losing resource x is described by

$$\mathrm{E}\dot{x} = ay. \tag{1}$$

Here, $\dot{x}$ ("x-dot") represents the change in resources x. Choosing a higher effort y has two consequences for expansion (retrenchment): (a) it decreases the expected time it takes to gain (shed) resource x; and (b) it increases the cost of gaining (shedding) resource x. A firm choosing to expand undertakes effort $y > 0$, to retrench undertakes effort $y < 0$, and to do neither undertakes $y = 0$. The expected rate of expansion or retrenchment is proportional to the effort y. (The specific

details of the formal implementation in the model are slightly more nuanced and are described in Appendix A.)

The expected cost of expansion or retrenchment also increases proportionally to effort level y. Indeed, this consequence encapsulates the time-compression diseconomies of growth, where it is more expensive to obtain the same number of resources in a shorter amount of time (Dierickx and Cool, 1989; Wibbens, 2021). The firm's cash outflow to expand by one resource is $c + y$. Similarly, the cash inflow of retrenching by one resource is $c - |y| = c + y$ (remember that $y < 0$ for retrenchment, so $|y| = -y$). The parameter c represents the (minimum) resource cost. The proportionality constant in front of y is set to one without loss of generality. One can merely think of the effort y being measured in terms of the additional cost it takes to expand or retrench (e.g., adjusting buildings/equipment or retraining employees for their new use). Note that a firm can never fully recoup its investment in a resource, because it has to choose a positive effort level to expand and a negative one to retrench. Both represent additional expenses. These expansion or retrenchment expenses are irreversible (i.e., they are sunk costs).

Resource dynamics are different between focused and diversified firms, because focused firms can only expand or retrench via external markets (i.e., acquisition and divestment), while diversified firms can additionally use internal resource markets (i.e., redeployment). In the model this difference is captured in the assumption that a focused firm has expansion/retrenchment capability a equal to the acquisition/divestment capability a_0 ("a-nought"). Diversified firms have a equal to the acquisition/divestment capability plus a redeployment capability r, such that $a = a_0 + r$. This captures the idea that the adjustment costs in internal markets might be different than the transaction costs in (external) markets for expansion or retrenchment, and diversified firms have the option of using the more efficient alternative. Table 1 summarizes these relations.

Insert Table 1 about here

The final factor influencing resource dynamics is uncertainty, a key source of inducement in prior models impacting redeployment (Sakhartov and Folta, 2015). There are multiple ways uncertainty has been modeled, such as through return volatility due to market shocks (Sakhartov and Folta, 2014) or as a shock to resource stocks (Chauvin and Poliquin, 2024). Note that conceptually the two are similar: both are random shocks to profit. The only difference is that in the former case market shocks affect the profit per resource, while in the latter they affect the number of resources. We assume the latter because that is the most parsimonious to incorporate in our modeling framework. Specifically, with probability rate p firms either gain or lose a resource over a given time period.

To calculate the equilibrium solution, firms are assumed to choose effort levels y that optimize their NPV. The NPV is equal to the sum of discounted future cash flows,

$$V = CF(0) + \frac{CF(\Delta t)}{(1+\rho)^{\Delta t}} + \frac{CF(2\Delta t)}{(1+\rho)^{2\Delta t}} + \cdots. \quad (2)$$

Here, $CF(t)$ represents the expected cash flow at time t, which consist of product market profit, expenses for resource expansion, and income from retrenchment. The parameter ρ represents the discount rate. Like vc_0, it can be set to any convenient value without loss of generality (we use $\rho = 0.1$, a discount rate of about 10% per period). Though time is a continuous variable in the model (which is convenient to implement), for expositional reasons the equations shown here are for (short) discrete time periods Δt. This doesn't alter the content of the equations.

In the MPE modeling framework, an equilibrium consists of a policy function that specifies the effort y for each firm as a function of the resource positions x_1 and x_2. It is calculated through an iterative procedure. One starts with some initial expected value for each combination of

resource position $V_i(x_1, x_2)$ for both firms $i = 1, 2$. This value function is then used to calculate the policy function $y_i(x_1, x_2)$ optimizing NPV. This policy function is then used to calculate a better estimate of the value function $V_i(x_1, x_2)$, which in turn is used for a new policy function $y_i(x_1, x_2)$, and so on. This process continues until new iterations do not noticeably improve the calculated value and policy functions anymore. All formal details are provided in Appendix A.

Insert Table 2 about here

Table 2 summarizes the parameters of interest, defining the market environment in which the firms operate. For each given set of parameters the equilibrium can be calculated. The equilibrium solution determines the probability evolution of all dynamic variables, such as resources x, effort levels y, and profit π for each firm, as well as the expected value for any combination of resource positions. This allows calculating the corporate (dis-) advantage from resource redeployment under varying degrees of competitiveness.

4 RESULTS

This section illuminates how our model, designed to capture the endogenous nature of market competitiveness, provides insight about the relationship between corporate scope and corporate advantage. Resource redeployability plays a special role because it affects the flexibility to enter and exit, so investigating whether or when it benefits diversified firms or disadvantages them relative to more committed rivals is the model's purpose.

Corporate advantage is defined as the relative advantage of a diversified firm over a focused firm, which has been empirically conceived as comparing the value of a diversified firm ($V_{\text{diversified}}$) to the weighted sum of the value of focused firms (V_{focused}) in the same businesses (Porter, 1987, Berger and Ofek, 1995). It is defined the same way here:

$$Corporate\ advantage = \frac{V_{\text{diversified}} - V_{\text{focused}}}{V_{\text{focused}}}. \quad (3)$$

The calculation of corporate advantage is the basis for assessing whether a firm should be diversified or focused—a negative value suggests a firm should divest and focus, whereas a positive value suggests a firm should diversify because it is more valuable to preserve corporate flexibility. To calculate corporate advantage, it is necessary to calculate MPEs in two equilibrium settings. In Equilibrium A, both firms are focused. This means they can only expand through acquisition and retrench through divestment (i.e., $a = a_0$). They have equal value, V_{focused}. In equilibrium B, Firm 1 is diversified (with value $V_{\text{diversified}}$) and Firm 2 is focused. The only difference between the firms is in their redeployment capability. Firm 1 can both acquire/divest and redeploy (i.e., $a = a_0 + r$), while Firm 2 can only do the former (i.e., $a = a_0$). The resulting corporate advantage thus reflects the value of a redeployment capability from diversification (Firm 1 in Equilibrium B) compared to not having that capability in the same competitive situation (Firm 1 in Equilibrium A). Figure 3 provides a schematic overview. In Section 4.3 we will consider corporate advantage from synergy potential in addition to redeployability.

Insert Figure 3 about here

Consistent with Sakhartov & Folta (2015), corporate advantage is analyzed at time zero for our main results. Firms at this time are starting to compete with zero resources (and thus zero profits). In a later analysis we also consider the corporate advantage in a more mature market.

4.1 Redeployment under low versus high competitiveness

Because our primary objective is to study the effect of competition on the scope decision, the investigation begins with a single set of parameters for which we only vary the level of competitiveness α. Table 2 lists the parameter values used in this Base case, reflecting market

conditions for which firms tend to grow reasonably fast but not excessively so.[5] Section 4.2 describes the effect of changing these Base case parameters.

Insert Figure 4 about here

Figure 4 shows the effect of changing the competitiveness α on corporate advantage. Lower competitiveness increases corporate advantage from resource redeployment, with this increase being accentuated at intermediate values of competitiveness. For high levels of competitiveness, around $\alpha \approx 0.7$, there is an inflection point. Beyond this inflection point corporate advantage from redeployability precipitously decreases, turning into a strong disadvantage.

Figure 5 helps to investigate the mechanism behind the result reported above. It shows the evolution of resource positions x over time for three different levels of competitiveness α. Because the process is probabilistic, expected values (Ex) are shown (Note that while x can only take discrete values, its expectation is continuous). The solid red line represents Firm 1 or 2 in Equilibrium A (focused firms competing with each other), the short-dashed blue line represents Firm 1 in Equilibrium B (diversified firm competing with focused), and the long-dashed green line represents Firm 2 in Equilibrium B (focused firm competing with diversified). Corporate advantage in Figure 4 stems from the difference between the short-dashed blue and solid red lines. The long-dashed green line is shown to further investigate the competitive dynamics in the latter equilibrium.

[5] If one takes extreme values, such as a very high resource cost c or low capability a, firms tend to grow very slowly or not at all. Conversely, very low resource cost or high capability lead to very rapid growth. The Base case parameters are in between these extremes.

Insert Figure 5 about here

Under low competitiveness (α = 0.2), a diversified firm competing against a focused rival grows slightly faster than a focused firm competing against a focused rival. The reason is that the diversified firm can choose between the more efficient expansion alternatives—resource redeployment or acquisition. This better ability of diversified firms to exploit high-growth markets is a key advantage of redeployment studied in prior literature (Wu, 2013; Dickler and Folta, 2020; Giarratana and Santaló, 2020). The fact that the two lines representing focused firms (one competing against a diversified firm and the other competing against another focused firm) are almost equal is sensible given that under low competitiveness there is little strategic interaction between firms. So, focused firm dynamics are hardly affected by whether rivals have a redeployment capability or not.

Under intermediate competitiveness (α = 0.5), the advantage of diversified firms compared to focused firms is enhanced, relative to the low competitiveness case. Interestingly, higher competitiveness (i.e., going from low to intermediate) does not significantly alter resources positions for diversified firms, but does significantly lower returns to focused firms, and especially focused firms competing with diversified firms (i.e., dashed green line). Why do we see such differences between returns to diversified firms versus focused firms? We can infer that the diversified firm's faster growth, due to its greater efficiency in expanding and retrenching, hurts profitability of its focused rival, giving the latter a lower incentive to spend effort on expansion. In turn, this slower expansion makes it even more profitable for the diversified firm to spend effort on expansion. Thus, under intermediate competition a diversified firm benefits from redeployability not only because of faster adaptation to unexpected shocks, but also because of the resulting virtuous cycle of additional investment incentives for itself and disincentives for its

focused competitor. This virtuous investment cycle is similar to the benefits of commitment documented in competitive strategy (Ghemawat, 1991). Therefore, we call it a diversified firm's *commitment advantage*. It leads to the higher corporate advantage for intermediate competitiveness reported in Figure 4 (relative to the low competitiveness case). The result that redeployability creates corporate advantages that are accentuated under intermediate competitiveness has not been previously diagnosed.

Finally, under high competitiveness (α = 0.8) the situation reverses. Intense competitiveness leads to a "winner takes all" dynamic in which firms must try to capture the leading position as fast as possible. The lagging firm then has an incentive to retrench from the market until it has no resources remaining ($x = 0$). A diversified firm's redeployment capability allows it to retrench faster and at lower costs, and will do so when competition makes it costly to simultaneously battle on two frontiers. Because of this retrenchment option, it is less committed to a market and lowers incentives to invest effort on expansion. Conversely, a focused firm competing with a diversified firm cannot retrench so easily, thus must win, and has a higher incentive to invest. This in turn makes it even less attractive for the diversified firm to invest, and so on. Thus, under strong competition, a diversified may have a *commitment disadvantage*. The competitive dynamics spawning from this disadvantage can be so large that under very intense competition the diversified firm has no incentive at all to invest anymore and just cedes the market to a focused, more committed firm. This leads to the strongly negative corporate advantage on the right-hand side in Figure 4. Appendix B provides further details behind the mechanisms described above.

Proposition 1. *Stronger **competitiveness** increases corporate advantage (deriving from redeployability) up to an inflection point, beyond which it precipitously decreases and leads to a disadvantage.*

4.2 The value of redeployment under various market conditions

Next, we consider the effects of how changing base case parameters affects competition, and hence corporate advantage. This allows further illumination of potential boundary conditions around how competition affects benefits to redeployability. Figure 6 shows the effect of changing a single parameter, with the others kept fixed at their Base case level (Table 2). In each panel, light grey represents a lower value for the changed parameter and dark grey a higher value. The intermediate lines represent the Base case levels depicted in Figure 4.

Insert Figure 6 about here

Note that all lines have the same structure—higher competitiveness leads to higher corporate advantage up to an inflection point, beyond which redeployability becomes a disadvantage. While all lines have the same structure, they differ in two respects: the size of corporate advantage up to the inflection point and the position of the inflection point along the competitiveness continuum. Below, we discuss these differences for each parameter.

Superior redeployment capability *r* (top-left panel in Figure 6) accentuates the positive effect of competitiveness on corporate advantage. For levels of competitiveness up to the inflection point, a higher level of redeployment capability leads to higher corporate advantage. While prior research has shown that the value of redeployability decreases with adjustment costs (Sakhartov and Folta, 2014), it has not considered how adjustment costs moderate how competitiveness affects corporate advantage. Redeployability creates more corporate advantage when a higher

redeployment capability *r* increases a diversified firm's ability to effectively compete. However, for high levels of competitiveness, beyond the inflection point, the corporate advantage rapidly turns into disadvantage, regardless of the level of redeployment capability. The position of the inflection point also appears unaffected.

> **Proposition 2**. *Stronger* ***redeployment capability*** *accentuates the positive effect of competitiveness on corporate advantage (deriving from redeployability) and has no discernible effect on the inflection point of competitiveness.*

Stronger acquisition/divestment capability (top-right panel) diminishes the positive effect of competitiveness on corporate advantage deriving from redeployability. This makes sense because higher acquisition capabilities a_0 leads to lower acquisition costs, making resource investment (or retrenchment) through redeployment relatively less attractive (Folta and O'Brien, 2006; Feldman and Sakhartov, 2022). The figure indicates that high acquisition capability decreases corporate advantage; and it shifts the inflection point to the left, meaning a lower level of competitiveness induces a corporate disadvantage. It also shows that low acquisition/divestment capability increases corporate advantage across the board, and shifts the inflection point to the right, such that only for very high levels of competitiveness does redeployability still lead to a disadvantage.

> **Proposition 3**. *Stronger* ***acquisition/divestment capability*** *diminishes the positive effect of competitiveness on corporate advantage (deriving from redeployability), and reduces the inflection point of competitiveness.*

Up to the inflection point, the effect of higher resource cost *c* (bottom-left panel) is similar to that of lower acquisition/divestment capability. This is sensible, since both higher resource cost and lower acquisition capability make it harder to acquire resources. Although, unlike lower acquisition capability, higher resource cost reduces the inflection point. The reason is that higher resource cost, like higher competitiveness, increases competitive amplification of any performance differences between firms (Wibbens 2021). This makes the market more prone to winner-takes-all dynamics. Therefore, the commitment disadvantage from redeployability becomes more pronounced as resource cost increases. This leads to the reduction of the inflection point.

Proposition 4. *Higher* ***resource cost*** *diminishes the positive effect of competitiveness on corporate advantage (deriving from redeployability), and reduces the inflection point of competitiveness.*

Finally, higher uncertainty *p* (bottom-right panel) accentuates the positive effect of competitiveness on corporate advantage. Uncertainty escalates the value of the more reversible resource investment alternative, which will always be redeployment because of its optional nature (Sakhartov and Folta, 2014). Our results indicate that this effect becomes stronger for higher levels of competitiveness, up to the inflection point. Uncertainty has no discernible effect on the position of the inflection point.

Proposition 5. *Higher **uncertainty** accentuates the positive effect of competitiveness on corporate advantage (deriving from redeployability), and has no discernible effect on the inflection point of competitiveness.*

Insert Figure 7 about here

All results reported so far pertain to corporate advantage at time zero, when both firms have no resources. Figure 7 shows the same analysis as before but now for a mature market in which both firms have $x = 4$ resources. The results of this analysis are attenuated but otherwise look very similar to the previous one in Figure 6. There are two reasons for this attenuation. First, in a new market, firms use their expansion capabilities more than in a mature one and a redeployment capability thus becomes more salient. Second, firms in more mature markets tend to be more valuable, so the relative difference in value tends to be smaller for the same absolute difference. In terms of Equation (3), even if $V_{\text{diversified}} - V_{\text{focused}}$ remains the same, corporate advantage will be smaller for a larger V_{focused}.

Proposition 6. ***Market maturity** attenuates the relations described in Propositions 1-5.*

4.3 The additional effects of (dis-) synergies

So far, we have only considered how resource redeployability and competitiveness interact to determine corporate advantage. In addition to redeployability, which creates value through the flexibility to shift resources across businesses over time, diversification might also create value through synergy. Helfat and Eisenhardt (2004) describe synergy as contemporaneous sharing of resources across businesses to generate intra-temporal economies of scope, and Levinthal and Wu

(2010) suggest that these economies result from sharing of scale-free resources, such as brands, patents, or market power. Scale-free resources do not carry an opportunity cost in their usage, in contrast to the non-scale-free resources that are used for redeployment, such as plants, equipment, or personnel.

A diversified firm's resource bundle will determine the level of synergy and redeployability at its disposal. Importantly, synergies can also be negative (i.e., dis-synergies). Recent work suggests that dis-synergies may be accentuated when adaptability is required because of additional coordination costs (Natividad and Rawley, 2016), and Chen, Kaul, and Wu (2019) speculate that firms pursuing redeployability may also experience dis-synergies because of the coordination costs of maintaining more redeployable resources. Ultimately, the specific nature of a diversified firm will determine its net level of (dis-) synergies and redeployability, which may interact in important ways (Sakhartov and Folta, 2014). Rather than dictating the specific nature of this interaction, our model allows a joint consideration of the two forces. For example, we will be able to see the total effect of redeployability on corporate advantage if there are synergies or dis-synergies.[6]

To incorporate (dis-) synergies in our model, we include the option that a diversified firm has a different level of value creation than a focused one. Specifically, a diversified Firm 1 has value creation parameter $vc_0 + \Delta vc$, while for Firm 2 it remains vc_0. Thus, Δvc reflects the synergies (if positive) or dis-synergies (if negative) in addition to the redeployability from diversification. Figure 8 shows the resulting profit functions for positive, zero and negative synergies under intermediate competition ($\alpha = 0.5$). Synergies increase profits across the board, in particular if the

[6] Modeling interactions would make the MPE model drastically more complex, the implications of which have already been elaborated. Hence, we leave it to future work to elaborate the many ways synergy and redeployment might interact.

competitor has a strong resource position (x_2 = 4 or 5). Dis-synergies have the opposite effect. Further implementations details are provided in Appendix A.

Insert Figure 8 and Figure 9 about here

Figure 9 shows the effects of synergies in conjunction with redeployability on corporate advantage. Corporate advantage is defined as before. The only addition is that the diversified firm now also can have (dis-) synergies in addition to redeployability. The three charts show the effect of (dis-) synergies for three different levels of redeployment capability *r*.

First note that, unlike redeployment capabilities, better synergies always have a positive effect on corporate advantage, even under high competitiveness. In the presence of just synergies (left panel in Figure 9), there is no inflection point. The reason is that synergies do not come with the potentially negative commitment effects of redeployability. A redeployment capability creates an additional option to retrench from a market. Synergies do not because they operate intra-temporally. Thus, more synergies are always better.

In conjunction with redeployability (middle and right panels in Figure 9), synergies increase the inflection point of competitiveness, while dis-synergies decrease it. Hence, if redeployability comes with an opportunity cost leading to dis-synergies, any positive effects of redeployability are reduced and any negative effects exacerbated. By contrast, if a diversified firm has scale-free resources allowing it to create synergies in addition to redeployability, this can strongly increase the corporate advantage as competitiveness increases, while also increasing the inflection point beyond which redeployability creates a disadvantage.

Proposition 7a. *Stronger competitiveness unambiguously increases corporate advantage deriving from* ***synergies***.

Proposition 7b. *When considered in conjunction with redeployability, higher synergies increase the inflection point of competitiveness.*

5 DISCUSSION

This paper considers the competitive implications of flexibility to redeploy resources. In so doing, it extends a vibrant and emergent literature emphasizing the benefits to resource redeployability in multi-unit firms, but ignoring the strategic benefits of commitment. A fundamental tension between resource flexibility and commitment arises since irreversible commitments are crucial for maintaining a valuable strategic position (Milgrom & Roberts, 1982; Ghemawat, 1991), while the ability to redeploy resources diminishes irreversibility (Sakhartov & Folta, 2014; Lieberman, Lee, and Folta, 2017) and grants firms organizational "agility" (e.g., Helfat et al., 2007; Teece, 2007; Teece, Peteraf, & Leih, 2016). Our results lead to propositions that extend understanding of how and when resource redeployability leads to corporate advantage, thereby illuminating the question of when firms should expand or contract their scope.

Our paper identifies important boundary conditions to understanding when redeployment flexibility creates or destroys corporate value. While redeployability may be a source of corporate advantage, when considering that flexibility interacts with and is affected by the competitive behavior of rivals, we find the effect of redeployability is not so straightforward. Consistent with prior research implicitly assuming benign competitive conditions, we find under conditions of low or intermediate competition, resource redeployability consistently leads to corporate advantage.

We also find that redeployability destroys value when competitiveness exceeds some inflection point. This suggests that in intensely competitive markets firms will be better off focusing. So, while prior work emphasizes how adjustment costs, transaction costs, inducements,

and uncertainty influence the value of redeployability, our work clarifies another determinant of value creation—that redeployment flexibility endogenously determines competition and the ability to credibly commit to a market. It shows that redeployability may be value-destructive for firms competing against focused rivals. Much like how Cortés's men escalated their battle intensity after their ships were burned, firms lacking redeployability may exhibit a credible commitment to succeed in a particular market and out-invest rivals that possess resource redeployability, thus leaving flexible firms with the option to retreat to alternative markets.

In more contemporary settings, this outcome is not unlike the battle for social media when in 2011 Google launched a Facebook copy called Google Plus.[7] Facebook was focused in social media, while Google competed in multiple markets with Gmail, YouTube, Android, and other businesses, and was hoping to make Google Plus more attractive to consumers by connecting it with its other products. When Google launched, however, CEO Mark Zuckerberg initiated an all-out war on Google, devoting the next year to crushing them, presumably because social media was Facebook's only market. In contrast, Google had attractive alternatives in their other business opportunities. They could, and did redeploy financial and human capital, with Google Plus product teams being rolled into the Android team. Awareness by Google and Facebook that this was a possibility, may have increased Facebook's intensity of attack and accelerated the Google Plus demise. By 2014, Google had largely left social media.

If redeployability might be disadvantageous, one might ask why multi-business firms cannot abandon redeployability when a credible signal is required. Even if a multi-business firm chooses not to redeploy in a given period, it retains the ability to do so, and will presumably choose

[7] https://www.vanityfair.com/news/2016/06/how-mark-zuckerberg-led-facebooks-war-to-crush-google-plus

that option if it is the most efficient. The only way it can send a credible signal of commitment to a certain market is by divesting from all other markets and becoming a focused firm. Even then, as demonstrated by Lieberman et al. (2017), exit may be a weak signal since firms having redeployable resources are able to re-enter at lower performance thresholds. Overall, the ability to redeploy resources diminishes the irreversibility of strategic decisions and thus, the ability to send a strong commitment signal.

We further diagnose the boundary conditions of resource redeployability by seeing how parameters: (a) moderate the effect of competitiveness on corporate advantage, and (b) influence of the inflection point of where competitiveness induces corporate focus. All parameters drastically influence how much value firms can derive in the face of competition. Up until a competitiveness inflection point, corporate advantage increases with redeployment capability and uncertainty, and decreases with acquisition/divestment capability and resource cost. The location of the inflection point determines how broadly beneficial is a redeployability strategy. Redeployability seems a less robust strategy under lower uncertainty, when resource cost is higher, and when firms have acquisition/divestment capability. The former is intuitive, because option value and uncertainty are intrinsically linked. The fact that greater resource cost lowers the competitiveness inflection point must be tied to how it accentuates the commitment of the focused firm; and acquisition/divestment capability must arm focused firms with transactional efficiency to offset the lack of internal resource markets.

To gain a more comprehensive picture of how resources affect corporate scope, we also diagnosed how synergies and dis-synergies might alter how competitiveness endogenously affects corporate advantage. Unlike redeployability, synergies are always valuable for a diversified firm. When combined with redeployability, corporate advantage is enhanced and the potential negative

effects of competitiveness are mitigated. So, firms having resource bundles allowing both redeployability and synergy seem to provide the strongest insurance against competition. In contrast, when dis-synergies are expected corporate advantage is reduced and competitiveness becomes more consequential.

It is worth noting that many of our findings are not obvious to deduce with informal reasoning. In addition to illuminating important boundary conditions to our understanding of when redeployment flexibility creates or destroys corporate value, there are other significant implications of our model and findings.

5.1 Implications for Dynamic Capabilities

We believe our model has important implications for the broader literature on dynamic capabilities (Helfat et al., 2007; Teece, 2007; Teece, Peteraf, & Leih, 2016), emphasizing the importance of resource flexibility and organizational "agility" as crucial capabilities in helping firms adapt to their environment. While it is widely acknowledged that developing and maintaining these capabilities can be costly, the absence of such capabilities is perceived to be even more detrimental for firms (Helfat & Peteraf, 2003; Teece et al., 2016), leading to the implication that firms should strive to cultivate dynamic capabilities over time. As we have shown in our model, however, adaptability may have negative competitive consequences if it signals a lack of commitment, willing to shift attention at the first sign of difficulty. Although our model speaks to one type of dynamic capability—resource redeployability—it is important for future research to explore the more general case. Competitive repercussions may undermine some of the value of dynamic capabilities, and understanding when and how is critical for advancing theory. The reason is that while dynamic capabilities may raise the prospect for competitive advantage, they may also reduce commitment to a market. In this sense, greater dynamic capabilities may raise performance

thresholds (Gimeno, et al., 1997), which could make it more likely for firms to exit a market at a given level of poor performance. To the extent that rivals recognize this lack of commitment, we believe it is dangerous to disregard the competitive implications of adaptability, even if it is convenient to do so.[8]

5.2 Implications for Real Options

Our model also complements other work showing how competition affects real option valuations (e.g., Grenadier, 2000; Smit and Trigeorgis, 1995), but has not explicitly examined how competition affects switching options in multi-business firms. Prior research has implemented option pricing models (Sakhartov and Folta, 2014, 2015) to estimate the value of redeployability for a single firm. We model two firms under oligopolistic competition. Our modeling approach to simultaneous consideration of both real options and competition has two distinct advantages over traditional real option approaches. First, real option pricing is ill-suited to incorporating competition because a firm's decision to exercise the redeployment option (i.e., to redeploy a resource to another market) depends on the future value of the option, which in turn depends on its competitor's decision to redeploy. This, of course, depends again on the focal firm's decision to redeploy, leading to an infinite loop of decisions depending on one another. The MPE approach that we employ resolves this conundrum. The equilibrium solution yields investment policies for both firms that are mutually consistent with each other. Each firm's investments optimize long-term value given the other firm's investments.

[8] Teece, Pisano, and Shuen (1997: 512) note "Firms that have a tremendous cost or other competitive advantage vis-à-vis their rivals ought not to be transfixed by the moves and countermoves of their rivals. Their competitive fortunes will swing more on total demand conditions, not on how competitors deploy and redeploy their competitive assets. Put differently, when there are gross asymmetries in competitive advantage between firms, the results of game-theoretic analysis are likely to be obvious and uninteresting."

Another advantage of using an MPE model is its infinite time horizon; whereas option models assume a fixed time period $t = 0$ to T after which the resource is deemed useless and has no remaining value (Sakhartov & Folta 2015: 1786). Additionally, whereas real option models usually pertain to a single resource, in our model firms can acquire multiple resources. This more realistically captures market dynamics. The infinite time horizon also has a technical modeling advantage. Time in the MPE model is homogenous, in the sense that the dynamic equations and parameters are the same at each time t. This implies that only one equilibrium needs to be solved, which is valid for every time $t \geq 0$. The only differences over time stem from different realizations of the state.

The biggest disadvantage of our model is that its greater complexity increases the computational burden. Accordingly, we have purposely kept the model parsimonious as to limit the state space of possible values for our parameters. We did however explore many different values of the parameter space and focused the analysis in this paper on those parameter combinations with the most interesting strategic insights.

5.3 Practical implications

Based on our study's insights, practical implications arise, particularly for industries characterized by high sunk costs and competitiveness, such as the high-tech sector. To make informed strategic decisions regarding whether to diversify or focus, managers must understand the level of competition and their rivals' behavior. This includes acknowledging the potential value destruction caused by having the flexibility to redeploy when competitors are focused. While pursuing redeployability through diversification is valuable in many cases, high levels of competitiveness warrant a focused strategy. Redeployability is justified under broader conditions when uncertainty is more intense, when firms lack acquisition/divestment capability, when resource investments are

less sunk, and if synergies can be obtained. Redeployability is justified under narrower conditions when uncertainty is low, when firms have acquisition/divestment capability, when resources are more sunk, and when dis-synergies are likely. Overall, our study provides implications for corporate strategists in high-tech firms, offering guidance on effectively leveraging resource redeployment capabilities while navigating the challenges posed by high sunk costs and intense competition in their industry.

5.4 Limitations and possible extensions

We intentionally maintained a parsimonious structure for the model, aligning most assumptions with prior literature to ensure a cohesive interpretation of results in relation to earlier studies. However, these assumptions may impose constraints on the extent to which the findings can be generalized. Nonetheless, these limitations offer avenues for future research, as many of them can be readily mitigated within the framework of the MPE model. For instance:

1. The current model encompasses two firms, which can be thought of as a focal firm and its primary competitor. Expanding this framework to incorporate additional firms, as well as entry and exit dynamics (Ericson & Pakes, 1995) could provide a more comprehensive depiction of industry dynamics. In its current form, however, our model with two firms operating in a single market in which only one firm has the potential to redeploy effectively incorporates prior work's focus on corporate advantage from resource redeployability in multi-business firms relative to single-business firms (e.g., Dickler et al., 2022).

2. The MPE as presently implemented centers on competition with a single type of redeployable resource; it could be extended to include multiple (heterogenous) resources. Whether and how these resources interact with one another might offer further insights into the competitive implications of having the flexibility to redeploy them. For instance, multiple resources can act as

substitutes (Barney, 1986) or complements (Adegbesan, 2009; Teece, 1986) and could undergo transformations due to technological evolution and deliberate strategic actions of the firm. Our model accounts for resource characteristics to the extent that they impact the cost to redeploy and adjust resources to be used in alternative markets. Specifically, this means that the resources implicitly considered in the current MPE are non-scale free (capacity-constrained) and fungible to the extent that it allows for use across different areas in the firm and across time at different levels of adjustment costs (Helfat & Eisenhardt, 2004; Levinthal & Wu, 2010; Sakhartov & Folta, 2014). We provided an extension to the model that also incorporated (dis-) synergies (Section 4.3). Extensions of the model could further consider, for example, the effect of multiple resources and their interactions in creating synergy and redeployability.

3. Our model incorporates any and all acquisition and redeployment costs that are sunk. Transaction costs resulting from the purchase of resources in the external market represent one form of sunk cost, but the implications of these costs have not been separately diagnosed, even if prior research emphasizes that greater external transaction costs will increase the benefits from redeployment (Giarratana and Santalo, 2020; Sohl and Folta, 2021). Future research might explore how these costs influence the relative payoffs of redeployment flexibility versus commitment.

4. Whether competition mitigates corporate advantage tied to redeployability will surely hinge on whether rivals observe redeployability. The present implementation of our model assumes perfect observability, and more generally, a strong form of forward-looking rationality practiced by firms. Specifically, firms are presumed to consider both their own and their competitors' optimal investment strategies in future decisions. However, Sakhartov (2018) predicts market participants may find it difficult to observe redeployability. So, in this sense, it is

possible our model misvalues redeployability. Future work might try to incorporate these considerations.

6 CONCLUSION

The purpose of this research is to clarify the boundary conditions for when resource redeployability creates value, helping to illuminate when firms should diversify or focus. We do so by considering whether and how competition bears upon value derived from redeployability. This approach differs from prior research considering redeployment in cases of limited competition. Our results confirm that under most conditions, an ability to redeploy is valuable. However, it also confirms that it may destroy value if competition is intense. We believe these, and other insights clarified by our model, help better understand when redeployability creates value. We further believe these implications are also pertinent to the broader literature on dynamic capabilities.

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TABLES

Table 1
Expansion and retrenchment capabilities for focused and diversified firms.

	Focused firm	Diversified firm
Expansion	Acquisition	Acquisition + redeployment
Retrenchment	Divestment	Divestment + redeployment
Capability parameter a =	a_0	$a_0 + r$

Table 2
Key parameters reflecting market and competitive conditions in the model.

Symbol	Parameter	Base case
α	Competitiveness	0.2 / 0.5 / 0.8
a_0	Acquisition & divestment capability	0.1
r	Redeployment capability (diversified firm only)	0.1
c	Resource cost	15
p	Uncertainty level (rate of resource shocks)	0.2

FIGURES

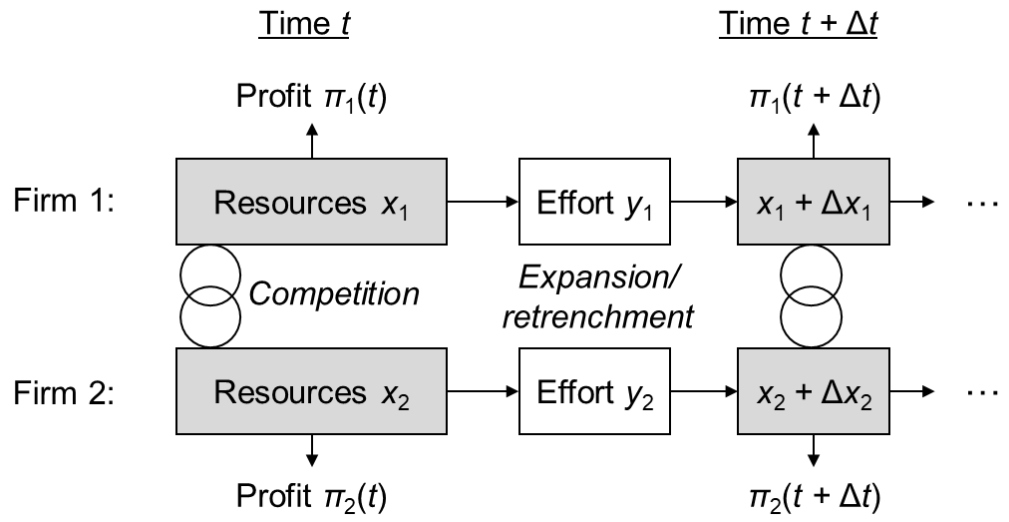

Figure 1
Schematic overview of the model dynamics. At any given time t, two firms compete on a product market. Their resource levels x_1 and x_2 determine their profits π_1 and π_2. Over time, each firm decides its level of expansion (or retrenchment) effort y. The higher this effort, the faster it can gain new resources Δx at a later time $t + \Delta t$. Each firm sets its effort level y such that it optimizes NPV, the sum of all future discounted expected profits $\pi(t)$.

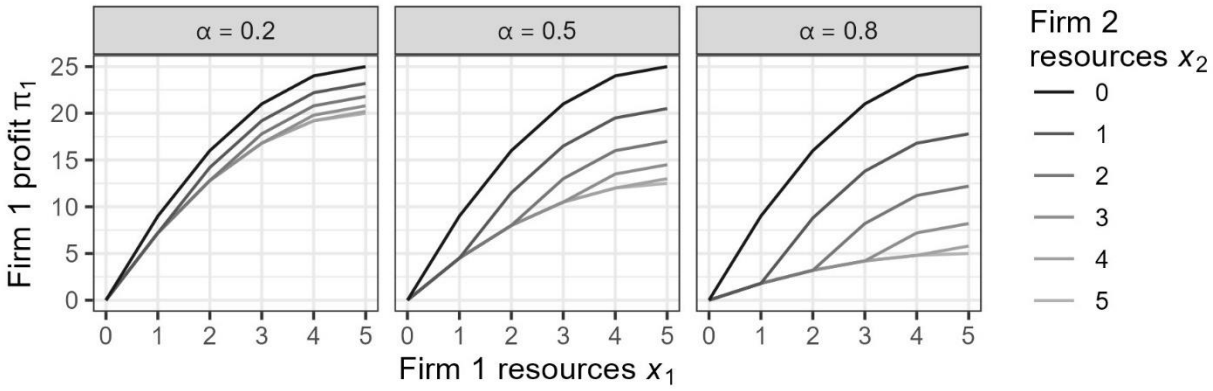

Figure 2
Profit as a function of resources, for different levels of competitiveness α. More resources x_1 always lead to higher profits, with diminishing returns. Under high competitiveness ($\alpha = 0.8$), the competitor's resources x_2 strongly diminish the focal firm's profit π_1, while under low competitiveness ($\alpha = 0.2$) they have little effect on it.

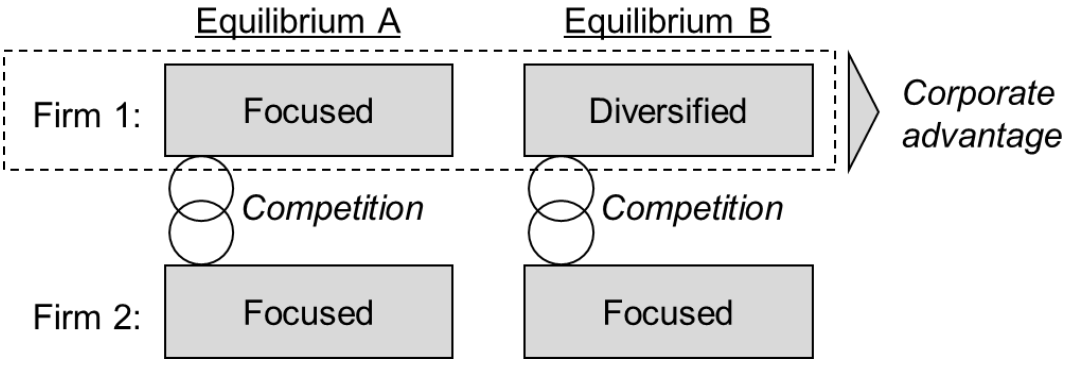

Figure 3
Equilibria used to calculate corporate advantage. The corporate advantage is calculated as the relative difference in value of a diversified firm minus that of a focused firm in the same competitive situation. Specifically, corporate advantage = $(V_{\text{diversified}} - V_{\text{focused}}) / V_{\text{focused}}$. $V_{\text{diversified}}$ is the value of Firm 1 in Equilibrium B, and V_{focused} that of Firm 1 in Equilibrium A.

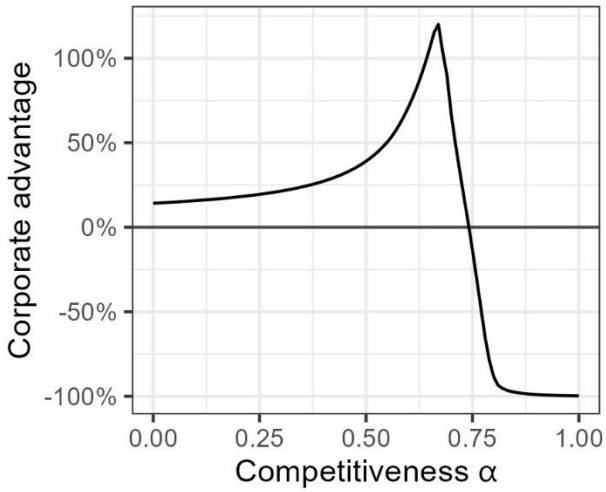

Figure 4
Corporate advantage from redeployment for different levels of competitiveness. All other parameters take their Base case values (Table 2). For lower values of competitiveness, corporate advantage from resource redeployment increases, and this increase becomes more rapid for intermediate values. By contrast, for high values of competitiveness, the corporate advantage rapidly decreases, vanishing almost completely when α reaches one.

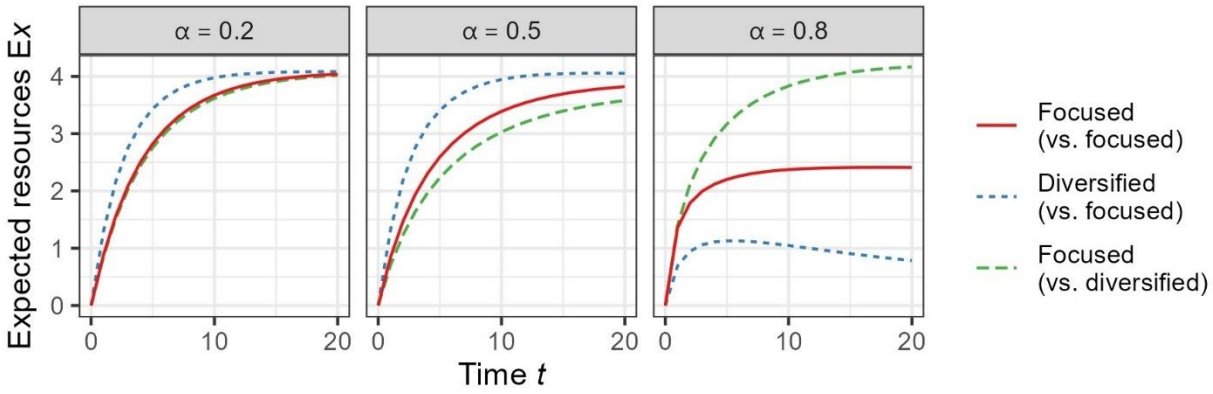

Figure 5
Evolution of resource positions. Under low competitiveness (α = 0.2) a diversified firm can use redeployment to grow faster than a focused firm. Under intermediate competitiveness (α = 0.5) a diversified firm has an even higher incentive to grow faster due to a commitment advantage. Under high competitiveness (α = 0.8), the situation reverses due to "winner takes all" dynamics leading to a commitment disadvantage for the diversified firm. It has little incentive to invest because of the option to easily retrench from the market. By contrast, a focused firm is committed to win because it cannot retrench so easily.

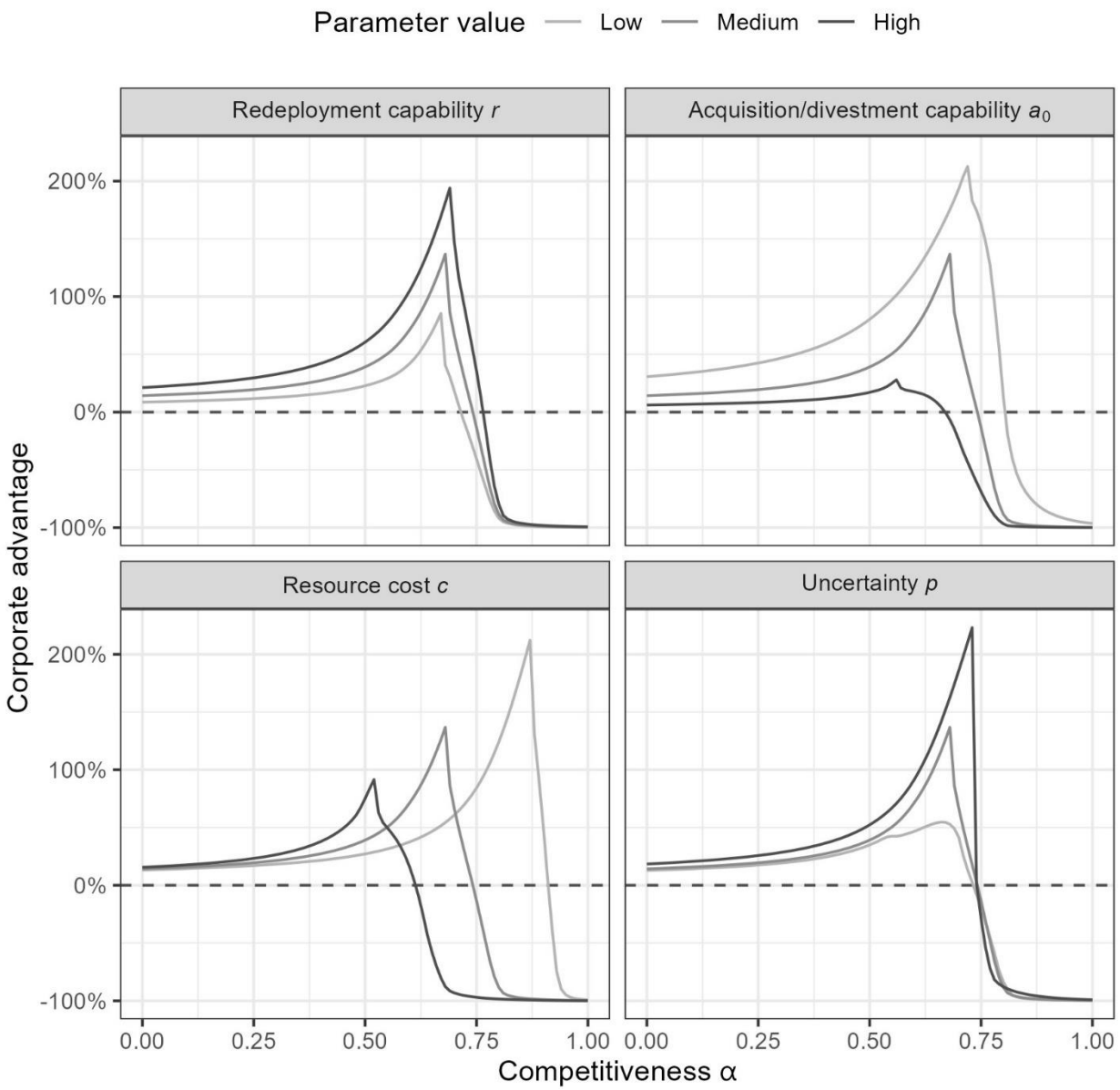

Figure 6

Each panel shows the effect of changing a single parameter, with the other ones kept fixed at their Base case level (Table 2). Light grey represents a lower value for the changed parameter, and dark grey a higher value. The intermediate line represents the Base case level, and is the same in each panel (and the same as Figure 4). While all lines have the same structure (as documented in Proposition 1), they differ in the level of corporate advantage up to the inflection point and in the position of the inflection point.

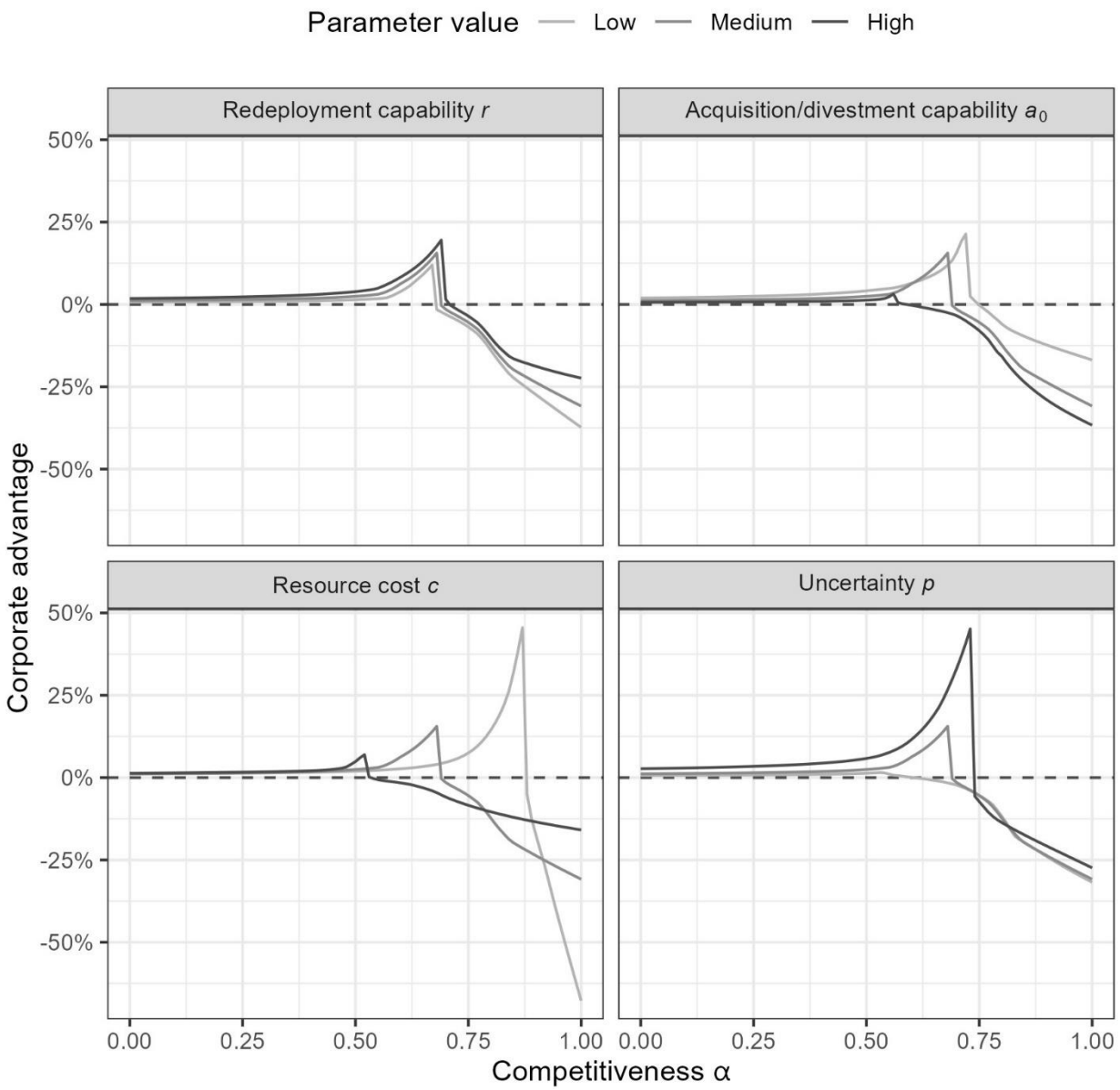

Figure 7
The same analysis as in Figure 6 for a mature market, in which both firms have $x = 4$ resources. Results are attenuated but otherwise similar as for an early-stage market.

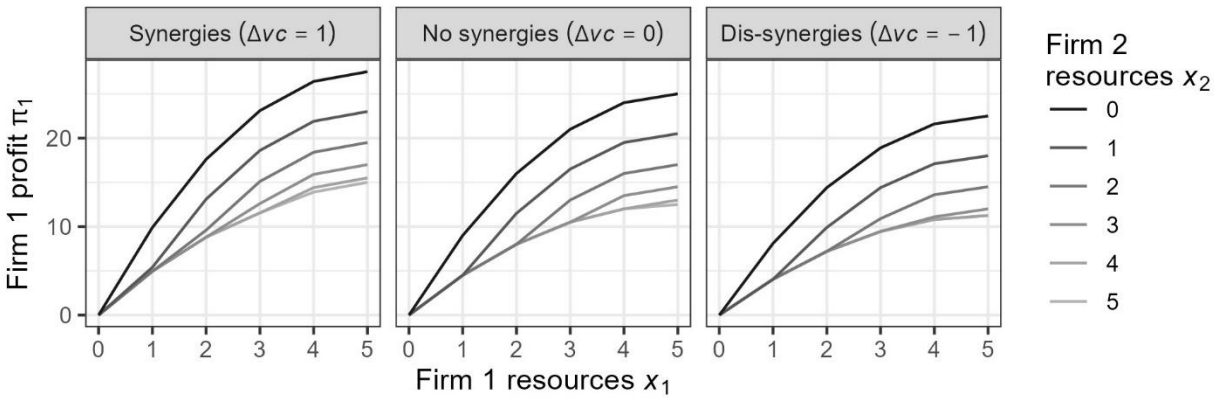

Figure 8
Profit functions for positive, zero and negative synergies for Firm 1, under intermediate competition (α = 0.5). Synergies increase profits across the board, in particular if the competitor has a strong resource position (x_2 = 4 or 5). Dis-synergies have the opposite effect.

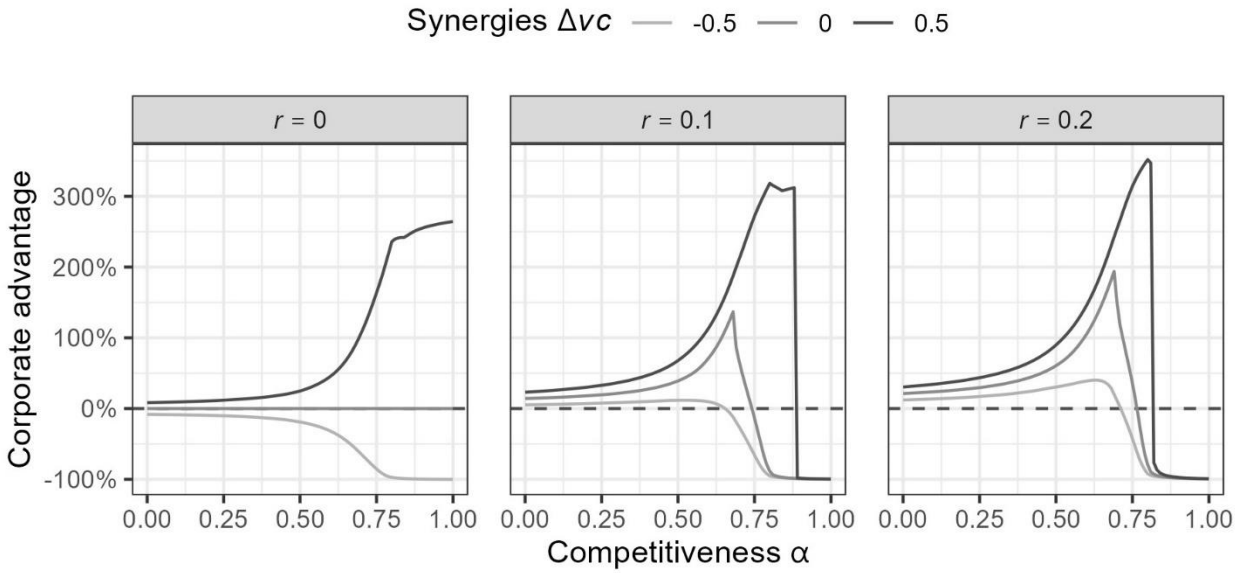

Figure 9
The effects of synergies in conjunction with three different levels of redeployment capability *r*. Unlike redeployment capabilities, better synergies always have a positive effect on corporate advantage, even under high competitiveness. Without redeployability, there is no inflection point. In conjunction with redeployability, higher synergies increase the inflection point of competitiveness.