WHEN RARENESS AND SCARCITY INTERACT: COMPLEMENTARY, SUBSTITUTION, AND CONFLICTING EFFECTS IN RESOURCE-BASED COMPETITIVE ADVANTAGE

ABSTRACT

Resource-based theory has long held that resources must be limited in supply to generate competitive advantage. Two distinct traditions emerged—Barney's emphasis on rareness (the degree to which a resource is possessed by few competing firms) and Peteraf's emphasis on scarcity (the degree to which aggregate demand exceeds available supply)—which Peteraf and Barney (2003) reconciled as "very nearly the same." While this phrasing left conceptual space for differences, subsequent literature has often treated rareness and scarcity as completely interchangeable. We refine this reconciliation by showing that while functionally similar, rareness and scarcity operate through sufficiently distinct mechanisms that their interaction creates dynamics interchangeability cannot predict. When resources exhibit both characteristics, three patterns emerge: complementary (mechanisms amplify advantage beyond additive effects), substitution (context determines dominance), and conflicting (mechanisms work at cross-purposes—differentiation creating unfulfillable demand, scarcity preventing network effects, or resource allocation dilemmas reducing net advantage below either alone). Conflicts indicate mechanistic distinction within functional similarity, as identical concepts cannot conflict. We specify boundary conditions determining patterns and examine how resource origins (exogenous versus endogenous) moderate strategic flexibility. Our framework refines Peteraf and Barney's reconciliation: functional similarity dominates when one mechanism operates; mechanistic distinctions require specification when both operate simultaneously.

Keywords: resource-based view; rareness; scarcity; competitive advantage; interaction effects; strategic resources

INTRODUCTION

The resource-based view (RBV) stands as one of the most influential frameworks in strategic management, fundamentally shaping how scholars understand the origins and sustainability of competitive advantage (Barney, 1991; Helfat et al., 2023; Peteraf, 1993; Wernerfelt, 1984). At its core, RBV posits that firms achieve superior performance through the acquisition, development, and deployment of valuable resources that competitors cannot easily replicate or substitute. A central tenet—arguably the sine qua non—of this perspective is that resources must be limited in supply to generate economic rents (Barney, 1991; Peteraf, 1993). Without supply constraints, valuable resources would be universally accessible, competitive dynamics would erode temporary advantages, and performance differences across firms would converge toward zero.

Despite this foundational importance, the conceptual nature of "limited supply" has remained surprisingly underspecified in the literature. Two distinct intellectual traditions emerged within RBV, each emphasizing different aspects of supply constraints. Barney's (1991) VRIN framework emphasized rareness—resources not possessed by large numbers of competing firms, focusing on distributional uncommonness across competitors. In contrast, Peteraf's (1993) cornerstone model emphasized scarcity—where supply fails to meet demand, creating ex ante limits to competition. Peteraf (1993:181) explicitly noted that competitive advantage does not "depend upon uniqueness or even rarity," rooting advantage instead in supply-demand imbalances. These traditions, while both contributing profoundly to our understanding of competitive advantage, originated from different theoretical foundations and initially appeared to describe distinct phenomena.

The reconciliation between these perspectives came with Peteraf and Barney's (2003) integrative work, which sought to resolve apparent tensions between the frameworks. The authors concluded that "Barney's requirement of resource rarity emphasizes the scarcity component of the model" and that "while the language in these two models may not correspond exactly, the meaning is very nearly the same" (Peteraf & Barney, 2003: 317). This reconciliation proved valuable in establishing coherence within RBV scholarship. Peteraf and Barney's phrasing—"very nearly the same" rather than "the same"—reflected theoretical care: they recognized functional similarity (both represent supply constraints enabling rent appropriation) while leaving conceptual space for differences. However, subsequent literature has often treated this as complete interchangeability (e.g., D'Oria, Crook, Ketchen, Sirmon, & Wright, 2021; Newbert, 2007; Voss, Sirdeshmukh, & Voss, 2008), effectively collapsing 'very nearly the same' into simply 'the same.' The boundary conditions determining when functional similarity dominates versus when mechanistic distinctions produce divergent outcomes remain underspecified, obscuring the nuance Peteraf and Barney's careful phrasing preserved.

While this functional similarity framing has enabled parsimony in RBV theorizing, we argue that the boundary conditions determining when "very nearly the same" accurately describes their relationship versus when mechanistic distinctions create divergent outcomes remain underspecified, obscuring important strategic dynamics that emerge when resources exhibit both characteristics simultaneously. If rareness and scarcity were functionally and mechanistically identical, then a resource possessing both attributes would simply demonstrate the same supply constraint through redundant labels. Yet empirical observation suggests something more complex: resources can be rare but not scarce (unique capabilities with limited external demand), scarce but not rare (common resources facing high demand), both rare and

scarce (unique resources with demand exceeding supply), or neither. This variation suggests that while rareness and scarcity are functionally similar, they may be mechanistically distinct enough to create complex interactions when both are present.

In this paper, we examine what happens when resources exhibit both rareness and scarcity simultaneously—a condition we argue is more common than currently recognized. We identify three distinct interaction patterns that emerge when both characteristics are present: complementary effects (where mechanisms amplify each other), substitution effects (where one mechanism dominates while the other contributes little), and conflicting effects (where mechanisms work at cross-purposes, potentially reducing net competitive advantage). The existence of conflicting patterns is particularly consequential: if rareness and scarcity were functionally and mechanistically identical, such conflicts would be theoretically impossible. Two labels for the same concept cannot work against each other. The presence of conflicts therefore indicates that while Peteraf and Barney correctly identified functional similarity, sufficient mechanistic distinction exists to enable conflicts, each with different antecedents, processes, and strategic requirements.

This paper makes three primary contributions to resource-based theory by refining the Peteraf and Barney (2003) reconciliation. First, we show that rareness and scarcity can coexist within the same resource and vary independently on both dimensions, indicating that "very nearly the same" functionally does not mean "identical mechanistically." While they serve similar functions (both create supply constraints enabling rent appropriation), the mechanisms through which they do so differ sufficiently to enable independent variation and complex interactions. This creates a more complex strategic landscape with important implications for competitive dynamics, as firms may pursue fundamentally different advantage logics—some

leveraging rareness through differentiation, others exploiting scarcity through access control, and still others managing the tensions or synergies when both are present. Second, we identify and theorize three distinct interaction patterns—complementary, substitution, and conflicting—that emerge when both characteristics are present. Conflicting patterns is particularly novel because functional similarity alone cannot predict or explain situations where mechanistic distinctions cause rareness and scarcity to work at cross-purposes. Third, we specify boundary conditions that determine which interaction pattern emerges, making the framework predictable and actionable. By specifying boundary conditions, we refine Peteraf and Barney's (2003) reconciliation: when only one mechanism operates, functional similarity dominates; when both operate simultaneously, mechanistic distinctions create interaction dynamics that require specification.

TWO TRADITIONS IN RESOURCE-BASED THEORY

Resource-based theory has achieved remarkable consensus on many of its core tenets, yet the conceptualization of supply constraints—arguably the theory's most fundamental requirement—remains surprisingly fragmented. While scholars universally agree that resources must exhibit some form of supply limitedness to generate economic rents, two distinct intellectual traditions emerged emphasizing different aspects of this constraint. These traditions developed largely in parallel, drawing from different theoretical roots and emphasizing different mechanisms through which supply constraints translate into competitive advantage.

The Barney Tradition: Rareness and Isolation Mechanisms

Barney's (1991) VRIN framework established rareness as one of four necessary conditions for sustained competitive advantage, defining rare resources as those not "possessed by large numbers of competing or potentially competing firms"(Barney, 1991: 106). This conceptualization situated competitive advantage squarely in the domain of possession

distribution—firms gain advantage by possessing resources that competitors lack. The rareness criterion focused explicitly on counting how many firms in the competitive environment possess strategically equivalent resources (Barney, 2001). A resource could be valuable and generate temporary advantage, but without sustained rareness, any performance gains would be competed away as rivals acquire or develop similar resources.

The theoretical foundations of this tradition trace to isolating mechanisms in industrial organization economics (Rumelt, 1984), resource position barriers (Wernerfelt, 1984), and the economics of strategic factor markets (Barney, 1986). Rumelt's work on isolating mechanisms emphasized that competitive advantage persists only when firms erect barriers that prevent rivals from imitating valuable positions. These isolation mechanisms—causal ambiguity, social complexity, time compression diseconomies, and asset mass efficiencies—protect rare resources from diffusion (Dierickx & Cool, 1989). When competitors cannot identify which resources drive advantage, cannot replicate socially complex organizational phenomena, or face prohibitive costs in accelerating resource accumulation, rare resources remain rare (Barney, 1991).

Recent work in this tradition has examined how digital technologies affect resource rareness (Nambisan, Lyytinen, Majchrzak, & Song, 2017), how dynamic capabilities can create temporary rareness through continuous innovation (Teece, 2007), and how rare intangible resources increasingly drive competitive advantage in knowledge economies (Helfat & Martin, 2015). The implicit strategic logic throughout remains consistent: advantage stems from being among the few who possess strategically valuable resources.

The Peteraf Tradition: Scarcity and Ex Ante Limits to Competition

Peteraf's (1993) cornerstone model articulated a complementary but conceptually distinct view, emphasizing scarcity as limited supply relative to demand. Critically, Peteraf explicitly

stated that this condition "does not depend upon uniqueness or even rarity" (Peteraf, 1993: 181), suggesting that resources need not be possessed by few to generate rents—they need only be insufficient to meet aggregate demand. This conceptualization shifted emphasis from possession distribution to the intersection of supply and demand: whether available quantities satisfy market demand. A resource could be widely possessed by multiple competitors yet still generate rents if total supply fails to meet total demand in strategic factor markets.

The theoretical roots of this tradition extend to Ricardo's (1817) theory of differential rent and industrial organization economics' analysis of market power from supply constraints (Caves & Porter, 1977; Porter, 1980). Ricardian rent theory demonstrated that even homogeneous factors of production generate rents when supply is limited relative to demand—fertile land or favorable locations appropriate rents not through uniqueness but through scarcity relative to needs (Mahoney & Pandian, 1992; Ricardo, 1817). The key mechanism is not isolation from imitation but rather ex ante limits to competition: before product market competition begins, some firms secure preferential positions in constrained factor markets (Barney, 1986; Peteraf, 1993).

This tradition emphasizes that scarcity creates rents through positional advantages—firms that secure access to scarce resources before competitors can appropriate value even when the resources themselves are widely possessed (Castanias & Helfat, 1991). Recent extensions have examined how digital platforms create new forms of scarcity through network effects (Parker, Alstyne, & Choudary, 2016), how global supply chains concentrate scarcity in specific nodes (Bode, Wagner, Petersen, & Ellram, 2011), and how regulatory constraints artificially create scarcity (Sine, Haveman, & Tolbert, 2005). The implicit strategic logic remains: advantage stems from controlling access to resources when demand exceeds supply.

The Reconciliation and Boundary Conditions

The apparent tension between these traditions—one emphasizing possession distribution, the other emphasizing supply-demand imbalances—prompted Peteraf and Barney's (2003) integrative effort. Their reconciliation concluded that "Barney's requirement of resource rarity emphasizes the scarcity component of the model" and that "while the language in these two models may not correspond exactly, the meaning is very nearly the same" (Peteraf & Barney, 2003: 317). This resolution established coherence within RBV and enabled scholars to move forward with a unified framework.

Peteraf and Barney's phrasing—"very nearly the same" rather than "the same"—reflected theoretical care: they recognized functional similarity (both represent supply constraints enabling rent appropriation by preventing competitive diffusion of valuable resources) while leaving conceptual space for differences. Subsequent literature, however, has often moved beyond this nuanced framing, treating rareness and scarcity as completely interchangeable—effectively collapsing any distinction into full synonymy (e.g., D'Oria, Crook, Ketchen, Sirmon, & Wright, 2021; Newbert, 2007; Voss, Sirdeshmukh, & Voss, 2008). The reconciliation established that rareness and scarcity serve equivalent functions in RBV theory—both enable firms to appropriate rents through supply limitedness. However, neither Peteraf and Barney nor subsequent research fully specified the boundary conditions determining when this functional similarity fully characterizes their relationship versus when mechanistic distinctions create divergent outcomes.

The subsequent literature has largely embraced this reconciliation. Meta-analyses of RBV research frequently collapse these concepts into a single construct when operationalizing resource-based advantage (e.g., Crook, Ketchen, Combs, & Todd, 2008; D'Oria, Crook, Ketchen, Sirmon, & Wright, 2021). Conceptual reviews use the terms when discussing supply constraints

(e.g., Barney, Ketchen, & Wright, 2011; Kraaijenbrink, Spender, & Groen, 2010). Empirical studies frequently operationalize "limited supply" without distinguishing whether they measure rareness or scarcity, treating the distinction as inconsequential (e.g., Newbert, 2007; Voss et al., 2008). This convergence has enabled theoretical parsimony and reduced potential confusion. Yet theoretical precision may require elaborating what "very nearly the same" means. If rareness and scarcity, while functionally similar, operate through sufficiently distinct mechanisms, then understanding their interaction dynamics when both are present becomes essential for both theory and practice.

Interaction Dynamics When Both Are Present

While Peteraf and Barney (2003) established that rareness and scarcity serve similar functions in RBV theory—both represent supply constraints enabling rent appropriation—the boundary conditions determining when this functional similarity fully characterizes their relationship versus when mechanistic distinctions produce divergent outcomes remain underspecified. Empirical observation reveals systematic variation suggesting that functional similarity coexists with mechanistic distinction. Resources can be *rare but not scarce*: highly specialized organizational capabilities that few competitors possess but for which external demand remains limited (Helfat & Peteraf, 2003). Resources can be *scarce but not rare*: common or widely understood resources facing temporarily high demand that exceeds available supply (Bode et al., 2011). Resources can be *both rare and scarce*: unique resources generating high demand that outstrips constrained supply (Adner & Kapoor, 2010). Resources can be *neither rare nor scarce*: widely available resources facing limited demand (Porter, 1980).

This systematic variation—with resources varying independently along both dimensions—reveals that while rareness and scarcity are functionally similar (both create supply

constraints), they are mechanistically distinct enough to vary independently. Table 1 illustrates this independent variation, showing how resources can occupy different quadrants. If they were functionally and mechanistically identical, such independent variation would be impossible. The variation suggests functional similarity coexists with mechanistic distinction. Moreover, if the mechanisms differ in their antecedents, processes, and effects, then their interaction when both are present becomes an important theoretical question requiring specification.

--- Insert Table 1 about here ---

The purpose of this paper is to examine what happens when resources exhibit both rareness and scarcity simultaneously—a condition we posit is particularly common for breakthrough innovations, luxury goods, and resources at the intersection of supply constraints and high demand. We identify three distinct interaction patterns: complementary effects (where mechanisms amplify each other, creating superadditive advantage), substitution effects (where one mechanism dominates while the other contributes little), and conflicting effects (where mechanisms work at cross-purposes, potentially reducing net competitive advantage).

The existence of conflicting patterns carries particular theoretical significance for refining Peteraf and Barney's reconciliation. If rareness and scarcity were functionally and mechanistically identical, such conflicts would be impossible. Two labels for the same underlying phenomenon cannot work against each other. The presence of conflicts therefore indicates that while functional similarity exists, sufficient mechanistic distinction enables conflicts, each with different strategic requirements, different sustainability threats, and different implications for competitive advantage. Understanding these interaction dynamics refines the reconciliation by specifying the boundary conditions under which functional similarity

accurately characterizes their relationship versus conditions where mechanistic distinctions create strategic complexities that require specification.

THEORETICAL DEVELOPMENT: MECHANISMS AND INTERACTIONS

Having established that rareness and scarcity represent distinct traditions within RBV, we now articulate the specific causal mechanisms through which each generates competitive advantage and examine how these mechanisms interact when both characteristics are present in the same resource. Our theoretical development proceeds in three stages. First, we specify the two distinct causal mechanisms—differentiation through rareness and access control through scarcity—showing that they operate through different logics, require different organizational capabilities, and face different sustainability threats. Second, we identify three interaction patterns that emerge when both mechanisms are present: complementary effects where mechanisms reinforce each other, substitution effects where competitive context determines dominance, and conflicting effects where mechanisms work at cross-purposes. Third, we examine how the exogenous versus endogenous origins of rareness and scarcity moderate these interaction patterns, affecting the strategic flexibility firms possess in managing these dynamics.

Two Distinct Mechanisms

Differentiation through rareness. Rareness, the degree to which a resource is possessed by few competing firms in the relevant competitive environment (Barney, 1991), generates competitive advantage through a differentiation mechanism rooted in limited distribution across competitors. When few competitors possess a strategically valuable resource, the firms that do possess it can leverage this uncommonness to create distinctive competitive positions. The causal pathway flows from limited possession to isolation mechanisms to differentiation in product markets to rent appropriation: resources possessed by few competitors enable firms to create

value propositions that most rivals cannot match (Barney, 1991), these advantages are protected by isolation mechanisms that prevent widespread acquisition or replication (Rumelt, 1984), the resulting differentiation allows firms to command premium prices or build customer loyalty, and rents are appropriated through superior willingness-to-pay or reduced price sensitivity (Brandenburger & Stuart, 1996).

The strategic requirements for building and sustaining rareness center on capability building, innovation, and constructing barriers that prevent competitors from acquiring or developing equivalent resources. Firms invest in R&D to develop proprietary technologies or organizational capabilities that few possess (Teece, 2007), engage in organizational learning to accumulate tacit knowledge that competitors cannot easily codify or transfer (Kogut & Zander, 1992), build complex organizational routines that exhibit causal ambiguity about their sources of effectiveness (Lippman & Rumelt, 1982), and cultivate socially complex phenomena such as organizational culture or reputation that resist deliberate management and imitation (Barney, 1991). The focus throughout is on ensuring few competitors possess the resource—maintaining the distributional advantage that enables distinctive strategic positioning.

Apple's ecosystem integration illustrates rareness-driven advantage. The company's competitive advantage stems from architectural capabilities to integrate hardware, software, services, and retail experiences into a seamless ecosystem—capabilities that few competitors possess (Gawer & Cusumano, 2014). While many firms have the technical knowledge to build smartphones or operating systems, few have successfully developed and maintained the integrative architecture that Apple possesses. The rareness of this capability—its possession by few competitors, protected by path dependence from decades of integrated development, causal ambiguity about which organizational routines enable the integration, and social complexity in

Apple's design-focused culture—enables differentiation that commands premium pricing and intense customer loyalty (Adner & Kapoor, 2016). The sustainability threat to this advantage comes primarily from diffusion: if many competitors successfully acquire or develop similar integrative capabilities (rareness erodes), or if customers find widely available alternatives sufficiently valuable (substitutability), the rareness-based advantage diminishes (Teece, 2018).

Access control through scarcity. Scarcity, the degree to which aggregate demand for a resource exceeds its available supply (Peteraf, 1993), generates competitive advantage through an access control mechanism rooted in supply-demand imbalances. When total demand in strategic factor markets outstrips available supply, firms compete intensely to secure access, and those achieving preferential positions appropriate rents regardless of how many other firms also possess the resource. The causal pathway runs from supply–demand imbalances to factor-market competition, positional advantage, and ultimately rent capture. When aggregate demand exceeds supply, firms compete for access to scarce resources (Barney, 1986). Firms that secure preferential positions—through early acquisition, exclusive contracts, vertical integration, or superior information—gain advantage (Castanias & Helfat, 1991). This positional advantage yields product-market benefits such as assured supply, lower input costs, or enhanced strategic leverage, enabling firms to capture rents by operating when rivals cannot or by charging premium prices in seller's markets created by supply constraints (Porter, 1980).

The strategic requirements for exploiting scarcity center on supply chain management, capacity optimization, and securing preferential access when demand outstrips supply. Firms invest in vertical integration or long-term contracts to guarantee supply in tight markets (Harrigan, 1985), develop superior information about factor markets to identify emerging supply-demand imbalances before competitors (Makadok, 2001), build operational efficiency to

maximize output from constrained inputs (Porter, 1996), and cultivate relationships with suppliers or regulators that provide preferential access when supply falls short of demand (Dyer & Singh, 1998). The focus throughout is on controlling access when demand exceeds supply—ensuring the firm can operate or fulfill customer needs when supply constraints prevent competitors from doing so.

Semiconductor manufacturing capacity during the 2020-2023 shortage demonstrates how scarcity generates competitive advantage. During this period, automotive manufacturers and consumer electronics companies faced severe production constraints not because semiconductor capabilities were possessed by few (many firms understand chip design, many foundries exist)—but because aggregate demand far exceeded available manufacturing capacity across the entire industry (Fuller, Jacobides, & Reeves, 2019). The scarcity existed at the industry level: total demand from all potential customers exceeded total manufacturing capacity across all suppliers. Firms that had secured long-term capacity commitments with TSMC, Samsung, or Intel through early contracting, volume guarantees, or co-investment arrangements gained significant advantage over rivals scrambling for allocations (Adner & Kapoor, 2010). The advantage stemmed not from being one of few firms with semiconductor capabilities but from controlling access to capacity when industry-wide demand exceeded industry-wide supply. This advantage erodes primarily when foundries build sufficient new fabs (increasing supply) or when aggregate demand moderates (reducing pressure), thereby eliminating the supply-demand imbalance (Bode et al., 2011; Hendricks & Singhal, 2005).

Distinctions Between Mechanisms

Four key distinctions establish that while rareness and scarcity serve similar functions (both create supply-constrained rents), they operate through sufficiently distinct mechanisms to

enable independent variation and complex interactions when both are present. First, they have different antecedents. Rareness typically originates from innovation, organizational development, or idiosyncratic learning—endogenous processes within firms that create unique capabilities (Teece, Pisano, & Shuen, 1997). In contrast, scarcity typically originates from demand shocks, capacity constraints, or regulatory restrictions—often exogenous factors outside individual firm control that create supply-demand imbalances (Porter, 1980).

Second, they face different sustainability threats. Rareness-based advantages are threatened primarily by diffusion, imitation, or substitution—competitors developing equivalent capabilities or customers finding alternative means of obtaining similar value (Zander & Kogut, 1995). Scarcity-based advantages are threatened primarily by capacity expansion, demand reduction, or the emergence of alternative supply sources—market forces that eliminate supply-demand imbalances (Hendricks & Singhal, 2005).

Third, they require different organizational capabilities. Exploiting rareness requires capabilities in innovation management, knowledge protection, and capability building—skills in developing and sustaining unique resources while preventing their diffusion (Teece et al., 1997). Exploiting scarcity requires capabilities in supply chain management, relationship management, and operational efficiency—skills in securing access to constrained resources and maximizing their utilization (Sirmon, Hitt, & Ireland, 2007).

Fourth, and most tellingly, they exhibit independent variation. As discussed earlier and illustrated in Table 1, resources can possess one attribute without the other: rare but not scarce, scarce but not rare, both, or neither. This independent variation is impossible if the concepts are functionally and mechanistically identical. The fact that resources systematically vary on both

dimensions establishes that rareness and scarcity represent distinct constructs (MacKenzie, 2003), challenging the complete synonymy that subsequent literature has assumed.

Table 2 provides a comprehensive comparison of these two distinct mechanisms, contrasting their definitions, causal pathways, theoretical roots, strategic requirements, sustainability threats, and underlying strategic logic. The table highlights that these are fundamentally different strategic games requiring different capabilities and facing different competitive dynamics.

--- Insert Table 2 about here ---

The theoretical implication is clear: rareness and scarcity exhibit functional similarity (both enable supply-constrained advantage) but sufficient mechanistic distinction (different antecedents, capabilities, sustainability threats, independent variation) to create complex interaction dynamics when both are present. A firm playing the rareness game invests in innovation and isolation mechanisms; a firm playing the scarcity game invests in supply chain positioning and access control. These are complementary perspectives on how supply constraints generate advantage, not redundant labels for the same phenomenon. Understanding this distinction becomes critical when examining what happens when resources exhibit both characteristics simultaneously—to which we now turn.

Interaction Pattern 1: Complementary Effects

When resources exhibit both rareness and scarcity, the two mechanisms can align and reinforce each other, creating competitive advantage that exceeds the sum of their independent effects. This complementary interaction occurs because the mechanisms operate through different causal pathways that, under certain conditions, mutually strengthen rather than substitute for each other. Differentiation through rareness creates customer demand by

establishing a value proposition few can match, while access control through scarcity intensifies that demand through psychological scarcity effects and supply constraint signaling (Cialdini, 1993). Simultaneously, the scarcity validates the differentiation—customers perceive that "if it's hard to get, it must be genuinely valuable"—while the differentiation justifies the scarcity as reflecting quality constraints rather than artificial manipulation (Verhallen & Robben, 1994).

The logic of amplification operates through several interconnected mechanisms. First, demand amplification: rareness attracts customer interest by offering what few competitors can provide, while scarcity triggers psychological reactance—the tendency to want things more when access is restricted (Cialdini, 1993). The combination creates intensified desire beyond what either mechanism alone would generate. Second, validation effects: scarcity signals that the rare offering is genuinely valuable—"others must want it if supply cannot meet demand"—providing social proof that reinforces perceived differentiation (Verhallen, 1982). Third, barrier multiplication: competitors face compounded challenges because they must both acquire the resource that few possess (rareness barrier) and secure supply when demand exceeds availability (scarcity barrier). Even if one barrier is breached, the other may hold (Rivkin, 2000). Fourth, pricing power reinforcement: both mechanisms support premium extraction through different logics—rareness justifies premiums through distinctive capabilities few possess, while scarcity justifies premiums through supply-demand imbalances (Peteraf & Barney, 2003).

Importantly, complementary effects need not be merely fortuitous—firms can actively orchestrate them through deliberate strategic choices (Milgrom & Roberts, 1995). The key lies in temporal coordination: building differentiation first establishes a value foundation that subsequent scarcity can amplify rather than undermine. Luxury brands like Hermès illustrate this orchestration. The company invests heavily in craft heritage, artisanal production methods, and

brand mystique—building rareness through capabilities that few competitors possess (Kapferer & Bastien, 2012). Simultaneously, it intentionally limits production, maintains multi-year waitlists for signature products like Birkin bags, and restricts distribution channels—creating scarcity that amplifies rather than undermines the differentiation (Catry, 2003). The scarcity appears authentic because it ostensibly reflects the time required for artisanal craftsmanship (rareness constraint), while the rareness gains credibility because the scarcity demonstrates genuine demand (market validation). Customers perceive both exclusivity of possession and constraint of access, willingly paying extraordinary premiums.

This orchestration requires organizational capabilities spanning both mechanisms—innovation and capability building to create genuine differentiation, plus supply chain management and capacity control to manage scarcity (Sirmon, Hitt, Ireland, & Gilbert, 2011). It also requires authenticity: customers must perceive the scarcity as genuine rather than artificially manipulated (Lynn, 1991). This discussion leads us to our first proposition:

> *Proposition 1. When resources exhibit both rareness and scarcity, complementary effects emerge whereby differentiation mechanisms and access control mechanisms mutually reinforce each other, generating competitive advantage that exceeds the sum of their independent effects.*

Interaction Pattern 2: Substitution Effects

While complementary effects occur when both mechanisms align, substitution effects emerge when competitive context determines that one mechanism dominates while the other contributes little additional advantage. This pattern reveals that the relationship between rareness and scarcity is not universally complementary but rather contingent on market characteristics and competitive dynamics. In certain contexts, one mechanism provides the primary source of competitive advantage, rendering investments in the subordinate mechanism subject to sharply diminishing returns (Porter, 1996). This substitution pattern validates Peteraf and Barney's

(2003) functional similarity framing within specific contexts—when one mechanism operates in isolation, functional equivalence indeed characterizes the relationship. However, the pattern is not universal—different contexts favor different mechanisms.

Scarcity dominance in commodity and low-differentiation markets. Crude oil markets illustrate scarcity dominance. While different crude grades exist, most purchasers view these as commodities where technical specifications matter more than producer identity (Porter, 1980). Competitive advantage stems overwhelmingly from access to reserves, favorable positions in distribution infrastructure, and operational efficiency in extraction and refining—all scarcity-related mechanisms. A petroleum company possessing capabilities that few competitors have in exploration or refining gains modest advantage compared to competitors who control access to large reserves or critical infrastructure when supply is tight. The market's commodity nature means differentiation yields diminishing returns, while scarcity exploitation drives most performance differences. Strategic priorities logically follow: firms should invest in supply chain optimization, vertical integration, and securing exclusive supply contracts rather than attempting differentiation that customers will not pay for (Harrigan, 1985).

Rareness dominance in innovation-intensive and differentiated markets. Conversely, in markets where differentiation is crucial to competitive positioning and where supply capacity is readily scalable, rareness mechanisms dominate over scarcity mechanisms (Porter, 1998). Customers in these contexts prioritize unique features, superior performance, or distinctive brand experiences over mere availability. Supply constraints are typically minimal or manageable through outsourcing, cloud infrastructure, or other scalable approaches (Baldwin & Clark, 2000). Even if temporary supply constraints emerge, they do not fundamentally determine competitive

outcomes because the primary basis of competition lies in possessing distinctive capabilities that few competitors have (Teece, 2007).

Consider software-as-a-service (SaaS) platforms as an example. Competitive advantage in enterprise software stems overwhelmingly from distinctive features, superior user experience, effective integration capabilities, and strong network effects—all rareness-related mechanisms (Gawer & Cusumano, 2014). Server capacity and bandwidth, while necessary, are readily scalable through cloud infrastructure, meaning supply constraints contribute minimally to competitive differentiation. A SaaS company with capabilities in user interface design or platform orchestration that few possess gains substantial advantage, while competitors with superior data center capacity but undifferentiated products struggle. This implies that firms should invest in R&D, distinctive capabilities, brand building, and isolation mechanisms rather than obsessing over capacity management when supply readily scales (Nambisan et al., 2017).

The strategic implications of substitution patterns are significant. Firms must diagnose which mechanism dominates in their competitive context and allocate resources accordingly. Misallocation errors are common and costly: pursuing differentiation in commodity markets wastes capital that could secure favorable supply positions, while obsessing over capacity constraints in innovation-intensive markets diverts attention from building unique capabilities. However, firms must also monitor for regime shifts—technological changes, regulatory evolution, or shifting customer preferences can transform which mechanism dominates (Christensen, 1997). Markets once considered commodities can become differentiation opportunities, while previously scarce resources can become abundant, fundamentally altering the competitive game (Adner & Kapoor, 2016). This leads to our next proposition:

> *Proposition 2. The relative contribution of rareness and scarcity mechanisms to competitive advantage depends on competitive context, with scarcity mechanisms*

dominating in commodity markets where differentiation potential is limited, and rareness mechanisms dominating in innovation-intensive markets where supply is readily scalable.

Interaction Pattern 3: Conflicting Effects

The most theoretically significant and practically challenging interaction pattern occurs when rareness and scarcity mechanisms work at cross-purposes, with the success of one mechanism undermining the effectiveness of the other. These conflicting effects represent our primary theoretical contribution to refining the reconciliation: if rareness and scarcity were functionally and mechanistically identical, conflicts would be theoretically impossible. The existence of conflicts reveals that "very nearly the same" reflects functional similarity but masks sufficient mechanistic distinction to enable antagonistic interactions. Two descriptions of the same phenomenon cannot work against themselves. The existence of conflicts provides compelling evidence that rareness and scarcity operate through genuinely distinct causal mechanisms with potentially antagonistic interactions (Fiss, 2011).

Conflicting effects emerge when the strategic requirements, organizational demands, or market consequences of one mechanism directly oppose those of the other, creating situations where investing in both mechanisms simultaneously may generate net competitive advantage lower than focusing on a single mechanism alone (Siggelkow, 2002). This challenges the accumulation logic implicit in much RBV theorizing—the assumption that possessing more favorable resource attributes necessarily creates stronger competitive positions. Instead, conflicts reveal that resource management requires strategic orchestration and sometimes difficult tradeoffs, not merely the accumulation of favorable characteristics (Sirmon et al., 2011).

Conflict type 1: Differentiation creates unfulfillable demand. The first conflict type occurs when rareness-driven differentiation successfully attracts customer demand but scarce supply capacity cannot fulfill that demand, generating customer frustration, reputational damage,

and opportunity costs that erode the competitive advantage differentiation created (Oliver, 1997). The mechanism operates as a destructive feedback loop: differentiation enabled by possessing capabilities few competitors have creates awareness and desire among potential customers, translating into purchase intentions and orders that may exceed firms' expectations. However, scarcity constraints—whether from manufacturing bottlenecks, supply chain limitations, or deliberate capacity restrictions—prevent fulfillment, leaving customers with unmet expectations and extended wait times. The more successful the differentiation in attracting demand, the more severe the fulfillment problems from scarcity, and the greater the reputational damage to the brand equity the differentiation built (Keller, 1993).

Tesla's Model 3 launch exemplifies this conflict. The vehicle's innovative design, electric powertrain technology, and brand cachet (rareness-driven differentiation from capabilities few possessed) attracted over 500,000 advance reservations within weeks—a remarkable validation of the product's unique value proposition (Perkins & Murmann, 2018). However, Tesla's manufacturing capabilities could not scale to meet demand, leading to years of delays, missed targets, and customer frustration as reservation holders waited 2-3 years for deliveries. The very success of Tesla's differentiation amplified the damage from production scarcity. Had the Model 3 been less innovative and attracted less demand, fewer customers would have been disappointed. The conflict manifested in deposit cancellations, negative press coverage, and reputational damage that undermined the brand equity Tesla had built through innovation. This represents a clear case where possessing both rareness and scarcity created worse outcomes than possessing strong differentiation with adequate capacity would have generated.

Conflict type 2: Scarcity prevents network effects and critical mass. The second conflict type occurs when rare resources require widespread adoption, network effects, or critical mass

for value realization, but scarcity constraints limit access and adoption, preventing the resource from achieving the breadth necessary to realize its differentiation value (Katz & Shapiro, 1985). This conflict is particularly acute for platform businesses, network goods, and technologies where value increases with the number of users or complementors (Parker et al., 2016). The mechanism creates a vicious cycle: limited availability constrains the installed base, reducing the incentive for complementors to support the platform, which undermines the differentiated value proposition, making the scarcity constraint even more problematic (Church & Gandal, 1992).

Video game console launches with supply constraints illustrate this conflict. Platform differentiation—proprietary technology, exclusive games, unique features that few competitors possess—attracts potential users and developers. However, if manufacturing scarcity limits console availability during the critical launch window, the installed base grows slowly, reducing developer incentives to create exclusive content for the platform (Corts & Lederman, 2009). With fewer exclusive games, the console's differentiation erodes, making the scarcity even more damaging to competitive positioning. Competitors with adequate supply, even if technologically inferior, may capture network effects and developer support, leading to market dominance despite weaker initial differentiation (Gallagher & Park, 2002). The rareness mechanism needs breadth and scale for value creation; the scarcity constraint imposes narrowness.

Conflict type 3: Resource allocation dilemmas between competing investments. The third conflict type stems from competing resource requirements: enhancing rareness demands R&D investment, capability building, and innovation focus, while addressing scarcity demands capacity expansion, supply chain development, and manufacturing scale-up (Pisano, 1994). These compete for limited financial resources and management attention within resource-constrained firms, forcing difficult allocation choices that may suboptimize performance on both

dimensions (Ocasio, 1997). The conflict is particularly acute because the two investment types often require different organizational structures, incentive systems, and cultural orientations that may be incompatible (O'Reilly & Tushman, 2008).

Pharmaceutical firms exemplify this allocation dilemma. Drug discovery requires sustained R&D investment to enhance rareness—developing novel compounds that few competitors possess (Henderson & Cockburn, 1994). Manufacturing scale-up requires capital investment in production facilities, process development, and regulatory compliance to address scarcity and meet patient demand (Pisano, 1997). These compete for finite capital and management attention, creating zero-sum tradeoffs: capital deployed to research becomes unavailable for manufacturing capacity, while resources devoted to scaling production come at the expense of next-generation drug development. Moreover, the organizational capabilities differ fundamentally—R&D organizations optimized for scientific innovation may resist diverting attention to manufacturing concerns, while operations teams focused on efficiency may view continued innovation as destabilizing (Leonard-Barton, 1992).

The theoretical significance of these conflicts cannot be overstated. They establish that while Peteraf and Barney correctly identified functional similarity, sufficient mechanistic distinction exists to enable conflicts—revealing the boundary conditions where "very nearly the same" requires refinement. They challenge the accumulation logic by showing that possessing multiple favorable attributes can, under certain conditions, create worse outcomes than possessing a single strong attribute. They indicate that resource-based advantage requires strategic orchestration—choosing which mechanisms to emphasize, sequencing investments to avoid simultaneous tensions, or accepting difficult tradeoffs—rather than simply accumulating favorable characteristics (Sirmon et al., 2011). These suggest the following propositions:

Proposition 3. When resources exhibit both rareness and scarcity, conflicting effects can emerge whereby the success of one mechanism undermines the effectiveness of the other, reducing net competitive advantage below what either mechanism would independently generate.

Proposition 4. Conflicting effects between rareness and scarcity mechanisms manifest through three distinct pathways: (a) differentiation-driven demand exceeding scarce supply capacity, (b) scarcity preventing the widespread adoption necessary for network-based value realization, and (c) competing resource allocation requirements between capability building and capacity expansion.

Table 3 synthesizes the three interaction patterns, comparing their relationship dynamics, net effects, key characteristics, examples, strategic imperatives, and theoretical significance. The table emphasizes that conflicting effects—our primary theoretical contribution—reveal mechanistic distinction within functional similarity, as mechanistically identical concepts cannot work against each other.

--- Insert Table 3 about here ---

Moderating Role of Resource Origins

The interaction patterns between rareness and scarcity mechanisms are not uniform across all resources but are importantly moderated by whether the constraints arise from exogenous factors outside firm control or from endogenous factors that firms can directly influence (Makadok, 2001). This distinction between resource origins affects the strategic flexibility firms possess in managing interaction dynamics, particularly their ability to orchestrate complementarities, avoid conflicts, or adapt (Helfat et al., 2007).

Exogenous constraints—those arising from natural limits, geological factors, regulatory restrictions, or market structure—represent conditions firms must accept as given (Sine et al., 2005). Examples include rare earth element deposits concentrated in specific geological formations, spectrum licenses allocated through regulatory processes, or natural resource scarcity from climate or geography. Firms facing exogenous constraints can position strategically around

them through early acquisition, superior information, or relationship building (Barney, 1986), but they cannot directly control whether the rareness or scarcity exists or its magnitude. This limited control restricts strategic flexibility: firms cannot easily time the emergence of complementarities, cannot readily adjust mechanisms to avoid conflicts, and must adapt strategies to fit constraints rather than shaping constraints to fit strategies.

Endogenous constraints—those created through firm capabilities, innovations, or deliberate strategic choices—represent conditions firms can develop, modify, or adjust (Teece et al., 1997). Examples include proprietary processes developed through R&D, intentional production limits chosen to maintain exclusivity, or organizational routines accumulated through experience. Firms creating endogenous constraints possess direct control over their existence, intensity, and timing, enabling greater strategic flexibility to orchestrate complementarities deliberately, adjust mechanisms to avoid conflicts, and reconfigure resources as conditions change (Sirmon et al., 2011).

The impact of origins on interaction patterns is substantial. When both rareness and scarcity are endogenously created, firms possess maximum strategic flexibility to orchestrate complementarity—luxury brands can simultaneously invest in craft heritage (endogenous rareness) while intentionally limiting production (endogenous scarcity), carefully timing and coordinating both mechanisms (Kapferer & Bastien, 2012). When both are exogenous, firms possess minimal flexibility—companies exploiting naturally rare mineral deposits in politically unstable regions (exogenous rareness meets exogenous geopolitical scarcity) must accept both constraints and adapt strategies accordingly. Mixed origins create intermediate flexibility—firms can leverage the controllable dimension to work with the fixed constraint, such as developing

strategic inventory management (endogenous) to buffer against naturally scarce water resources (exogenous), but cannot fully orchestrate both mechanisms (Pfeffer & Salancik, 1978).

This moderation affects particularly the ability to avoid or escape conflicts. When conflicts emerge between endogenous rareness and endogenous scarcity, firms can adjust either mechanism—expanding capacity, moderating marketing to reduce demand, or sequencing market entry (Adner & Kapoor, 2010). When conflicts involve exogenous constraints, adjustment options narrow significantly, potentially trapping firms in unresolvable tensions. Strategic flexibility thus emerges as a meta-capability—the ability to reconfigure resources and adjust mechanisms as interaction patterns shift—that depends critically on whether firms control the origins of their rareness and scarcity (Helfat et al., 2007). This leads to our final proposition:

> *Proposition 5. The interaction pattern between rareness and scarcity mechanisms is moderated by their origins, with endogenously created constraints offering greater strategic flexibility to orchestrate complementarities and avoid conflicts than exogenously determined constraints.*

DISCUSSION

Theoretical Contributions

This paper advanced resource-based theory by refining the Peteraf and Barney (2003) reconciliation of rareness and scarcity. While Peteraf and Barney carefully stated the meanings are 'very nearly the same'—leaving conceptual space for differences—subsequent literature has often treated them as completely interchangeable. We showed that while rareness and scarcity serve similar functions as Peteraf and Barney argued (both represent supply constraints enabling rent appropriation), they operate through sufficiently distinct mechanisms that their interaction when both are present creates dynamics that complete interchangeability cannot predict. We added precision to the reconciliation by specifying boundary conditions determining when

functional similarity accurately characterizes their relationship versus when mechanistic distinctions produce divergent outcomes requiring specification.

Refining the reconciliation through independent variation and mechanistic distinction. We showed that rareness and scarcity can coexist within the same resource and vary independently along both dimensions. Where subsequent literature treated them as completely interchangeable, we restore the nuance Peteraf and Barney's careful phrasing preserved. The systematic variation illustrated in Table 1—resources occupying different quadrants based on possession distribution versus supply-demand balance—reveals that 'very nearly the same' functionally does not mean 'identical mechanistically.' While Peteraf and Barney correctly identified functional similarity, the mechanisms differ sufficiently to enable independent variation. If functionally and mechanistically identical, such variation would be impossible, yet we observe it (Fiss, 2011). This has important implications: rather than a single dimension of "supply limitedness," we must recognize functional similarity operating through mechanistically distinct pathways that can combine when both are present.

This complexity extends beyond firm-level implications to shape competitive dynamics at the industry level. Firms competing in the same industry may pursue fundamentally different advantage logics—some leveraging rareness through differentiation, others exploiting scarcity through access control, and still others managing the synergies or tensions when both are present. This strategic heterogeneity can create asymmetric competitive relationships where firms with different mechanisms may not directly threaten each other, enabling multiple viable strategic positions to coexist within industries (Cool & Schendel, 1987). A luxury brand pursuing rareness-based differentiation may coexist relatively peacefully with mass-market producers exploiting operational efficiencies, whereas firms attempting both mechanisms simultaneously

without appropriate orchestration may face internal conflicts that constrain their competitive effectiveness (Porter, 1996).

Identifying conflicting interactions as a novel theoretical phenomenon. We identified and theorized conflicting effects between rareness and scarcity mechanisms—situations where mechanistic distinctions cause these functionally similar concepts to work at cross-purposes, potentially reducing net competitive advantage below what either mechanism would independently generate. This represents a fundamental departure from existing RBV theorizing, which implicitly assumes that possessing multiple favorable resource attributes creates stronger competitive positions (Barney, 1991). While configurational approaches have recognized complementary and substitutive interactions among strategic variables (Fiss, 2011), the possibility of antagonistic interactions—where favorable attributes actively undermine each other—has received limited theoretical attention in the strategy literature (Porter, 1996).

The existence of conflicting patterns adds critical precision to 'very nearly the same,' as mechanistically identical concepts cannot work against themselves. Yet we identified three distinct conflict mechanisms (differentiation creating unfulfillable demand, scarcity preventing network effects, and competing resource allocation requirements), each creating strategic tensions where one mechanism's logic directly opposes the other's requirements (Sirmon et al., 2011). These conflicts reveal that Peteraf and Barney's 'very nearly' reflects functional similarity but masks sufficient mechanistic distinction to enable antagonistic interactions.

This contribution challenged the accumulation logic implicit in much RBV research—the assumption that more favorable attributes necessarily create stronger positions (Newbert, 2007). Instead, we showed that resource management requires orchestration: understanding how attributes interact, recognizing context-dependent patterns, and building capabilities to manage

these dynamics (Helfat & Peteraf, 2009). This aligns with calls for configurational approaches that move beyond additive models (Fiss, 2011).

Specifying boundary conditions for predictable interaction patterns. We specified boundary conditions determining which interaction pattern emerges, adding precision by identifying when functional similarity dominates versus when mechanistic distinctions create divergent outcomes. These include demand characteristics and capabilities for complementarity, competitive regime (commodity versus innovation-intensive) for substitution, and growth dynamics combined with scaling constraints for conflicts (Milgrom & Roberts, 1995; Teece, 2007). This specification of the contextual factors will enable researchers to develop hypotheses about when complementary, substitution, or conflicting effects should be observed.

Moreover, boundary condition specification uncovered an important insight: the moderating role of resource origins in determining strategic flexibility (Makadok, 2001). Firms possessing endogenously created rareness and scarcity enjoy greater strategic flexibility to orchestrate complementarities deliberately, adjust mechanisms to avoid conflicts, and reconfigure resources as conditions change (Teece et al., 1997). Firms facing exogenously determined constraints must adapt strategies to fit immutable conditions. This suggests that strategic flexibility itself—the meta-capability to reconfigure resources and adjust mechanisms—may constitute an important source of sustained advantage, particularly in dynamic environments where interaction patterns shift over time (Helfat & Peteraf, 2009).

Refining the reconciliation with boundary conditions. We refined the Peteraf and Barney (2003) reconciliation by specifying boundary conditions that determine when functional similarity accurately characterizes their relationship versus when mechanistic distinctions dominate. Importantly, Peteraf and Barney's phrasing—"very nearly the same"—left conceptual

space for the distinctions we developed. We restored and elaborated the nuance their phrasing implied but that subsequent literature has overlooked. The reconciliation established functional similarity: rareness and scarcity both represent supply constraints enabling rent appropriation by preventing competitive diffusion of valuable resources.

Our framework accepted this functional similarity while adding precision through boundary conditions. The reconciliation holds strongly when only one mechanism operates—in such contexts, they are indeed functionally equivalent pathways to supply-constrained advantage, validating Peteraf and Barney's core insight. The reconciliation requires refinement when both mechanisms operate simultaneously—here, mechanistic distinctions create interaction dynamics (complementary, substitution, conflicting) that functional similarity alone cannot predict.

The reconciliation established theoretical coherence and enabled RBV to move forward as a unified framework. We enriched this foundation by adding boundary condition precision: functional similarity dominates in many contexts (validating the reconciliation), but mechanistic distinctions matter when both mechanisms operate simultaneously (requiring specification). This refinement preserves coherence while adding precision about when "very nearly the same" accurately describes their relationship. Just as Peteraf and Barney bridged apparent tensions between VRIN and cornerstones frameworks, we bridge the gap between treating rareness and scarcity as equivalent and recognizing their distinct interaction dynamics when both coexist.

Managerial Implications

Beyond theoretical contributions, our framework provides practical guidance for managers navigating resources that exhibit both rareness and scarcity. The central insight is diagnostic: possessing both characteristics does not automatically ensure stronger competitive positions—the interaction pattern determines outcomes. Managers should first assess which

mechanism(s) currently generate advantage (differentiation through limited possession or access control through supply-demand imbalances), then evaluate whether both characteristics are present, and finally predict the likely interaction pattern based on market context, resource attributes, and organizational capabilities. This diagnosis enables strategic alignment rather than assuming both mechanisms always complement each other.

Strategic responses must differ by pattern. For complementary effects, invest in both mechanisms simultaneously while paying careful attention to temporal coordination—build differentiation first through R&D and brand building, then introduce or emphasize scarcity to validate rather than undermine the established value proposition. For substitution effects, focus resources on the dominant mechanism: in commodity contexts, prioritize supply chain optimization and access control; in innovation-intensive contexts, prioritize R&D and distinctive capabilities. Avoid misallocating resources by pursuing differentiation in commodity markets or obsessing over capacity in scalable innovation contexts. For conflicting effects, choose among difficult options: prioritize one mechanism while accepting suboptimal performance on the other, sequence investments to avoid simultaneous tensions (build capacity before marketing drives unsustainable demand), or manage expectations proactively through transparent communication about constraints.

Common traps include assuming both mechanisms always help (conflicts reveal this is false), ignoring conflicts hoping they resolve naturally (inaction often exacerbates problems), splitting resources evenly when one dominates (dilutes strategic focus), and missing regime shifts that transform interaction patterns. Organizations must develop dynamic capabilities to sense pattern changes, respond quickly when complementarity emerges or conflicts threaten, and reconfigure resource deployment as competitive contexts evolve (Teece, 2007).

Limitations and Future Research

Our analysis maintains a firm-level focus appropriate to traditional RBV domains but leaves ecosystem, network, and inter-organizational levels underaddressed. Future multilevel research could examine how interaction patterns manifest in strategic alliances where partner resources combine (Dyer & Singh, 1998), how platform ecosystems manage rareness-scarcity dynamics across stakeholder groups (Parker et al., 2016), and how supply networks coordinate when critical nodes exhibit both characteristics (Bode et al., 2011).

We deliberately focus on the "R" dimension within VRIN, leaving interactions with value, inimitability, and non-substitutability for future investigation. While this enables analytical depth, it creates opportunities for broader VRIN integration. Research could extend our interaction logic to other dimensions. For example, do valuable but common resources facing scarcity generate similar advantages as valuable rare resources? Does inimitability strengthen complementarity or mitigate conflicts? Does non-substitutability create additional patterns? Configurational methods, particularly fuzzy-set QCA, could map complete VRIN combinations and identify equifinal paths to competitive advantage (Fiss, 2011).

Moreover, our analysis is largely static, presenting patterns at a point in time without fully theorizing dynamic evolution. While acknowledging that patterns shift—complementary becoming conflicting as differentiation outpaces capacity, substitution changing as regimes evolve—we lack detailed process theories of transitions (Langley, 1999). Longitudinal research could examine how firms navigate pattern transitions, what triggers transformations, whether path dependencies constrain evolution, and what dynamic capabilities enable adaptation.

Finally, our framework's generalizability across institutional contexts, resource types, and strategic objectives requires investigation. For example, do tangible versus intangible resources,

or digital versus physical resources, exhibit different interaction dynamics given differences in replicability and scalability? Do firms pursuing social impact alongside financial performance experience different patterns given dual objectives? Do interaction patterns differ between emerging and developed markets where institutional voids affect factor market functioning? Studies segregated by resource type, investigations of hybrid organizations, and cross-national comparative research could establish contextual boundaries while potentially revealing novel patterns our framework has not identified.

CONCLUSION

Resource-based theory has long held that resources must be limited in supply to generate competitive advantage, yet how "limited supply" operates remained underspecified across two traditions—Barney's emphasis on rareness (possession by few) and Peteraf's emphasis on scarcity (demand exceeding supply). We refined Peteraf and Barney's (2003) reconciliation of these traditions as "very nearly the same" by specifying boundary conditions determining when functional similarity accurately characterizes their relationship versus when mechanistic distinctions create divergent outcomes. We argued that while rareness and scarcity serve similar functions, they operate through sufficiently distinct mechanisms that their interaction when both are present creates three patterns: complementary, substitution, and conflicting. By specifying that the reconciliation holds when one mechanism operates in isolation but requires refinement when both operate simultaneously, we preserved Peteraf and Barney's core insight while adding precision about when and how rareness and scarcity interact to shape competitive advantage in contemporary strategic contexts.

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TABLE 1
Independent Variation of Rareness and Scarcity

	High Scarcity (Demand > Supply)	**Low Scarcity (Demand ≤ Supply)**
High Rareness (Possessed by Few)	BOTH RARE & SCARCE • NVIDIA advanced GPUs • Hermès Birkin bags • Breakthrough pharmaceuticals *Interaction patterns emerge*	RARE BUT NOT SCARCE • Specialized niche capabilities • Toyota Production System • Proprietary processes with limited demand *Differentiation mechanism dominates*
Low Rareness (Possessed by Many)	SCARCE BUT NOT RARE • Semiconductor capacity (2020-2023) • Crude oil during supply shocks • Generic commodities during demand spikes *Access control mechanism dominates*	NEITHER RARE NOR SCARCE • Commodities in equilibrium • Widely available resources • Basic office supplies *No competitive advantage*

TABLE 2
Two Distinct Mechanisms Compared

Dimension	**Differentiation Through Rareness**	**Access Control Through Scarcity**
Definition	The degree to which a resource is possessed by few competing firms in the relevant competitive environment (Barney, 1991)	The degree to which aggregate demand for a resource exceeds its available supply (Peteraf, 1993)
Causal Pathway	Possessed by few → Isolation mechanisms → Differentiation → Rent appropriation	Demand > Supply → Factor market competition → Positional advantage → Rent capture
Theoretical Roots	Isolating mechanisms (Rumelt, 1984); VRIN (Barney, 1991); Resource position barriers (Wernerfelt, 1984)	Ricardian rents (Ricardo, 1817); Ex ante limits (Peteraf, 1993)
Strategic Focus	R&D, capability building, innovation, barriers to diffusion	Supply chain management, capacity investment, exclusive access, vertical integration
Required Capabilities	Innovation management, knowledge protection, organizational learning	Supply chain expertise, relationship management, operational efficiency
Sustainability Threats	Diffusion to many competitors, imitation, substitution, knowledge spillover	Capacity expansion, demand reduction, alternative supply sources
Strategic Logic	"How do we ensure few competitors possess what we have?"	"How do we control access when demand exceeds supply?"
Example	Apple's ecosystem integration (few possess these architectural capabilities)	Semiconductor manufacturing capacity 2020-2023 (industry demand exceeded industry supply)

TABLE 3
Three Interaction Patterns—Characteristics and Implications

Pattern	Complementary Effects	Substitution Effects	Conflicting Effects
Relationship	Mechanisms reinforce each other	One mechanism dominates; other adds little	Mechanisms work at cross-purposes
Net Effect	Advantage > Sum of parts (superadditive)	Advantage ≈ Dominant mechanism only	Advantage may be < Either mechanism alone
Key Boundary Conditions	• Inelastic demand • Customer perception of both • Capabilities for both • Proper temporal sequencing	• Scarcity dominance: Commodity markets, low differentiation potential • Rareness dominance: Innovation-intensive markets, scalable supply	• Rapid unpredictable growth • Scaling difficulties • Network effects required • Resource constraints • High availability expectations
Example	Hermès: Craft heritage (few possess) + Production limits (demand > supply) = Amplified luxury positioning	Scarcity: Crude oil markets Rareness: SaaS platforms	Type 1: Tesla Model 3 Type 2: Console launches Type 3: Pharma R&D vs. manufacturing
Strategic Imperative	Invest in both; time scarcity after differentiation	Focus on dominant mechanism; monitor for regime shifts	Choose priority, sequence investments, or manage expectations
Theoretical Significance	Extends complementarity theory	Validates functional similarity within contexts	Reveals mechanistic distinction within functional similarity (mechanistically identical concepts cannot conflict)
Managerial Challenge	Orchestration and authenticity	Resource allocation and focus	Difficult tradeoffs and active conflict resolution