To Balance or Not To Balance: Resource-Contingent Performance to Exploration–Exploitation Orientation

Abstract

Research Summary: Research on organizational ambidexterity has long reported contradictory performance effects: some studies show that balancing exploration and exploitation yields superior results, whereas others find that focused commitment to one activity is more advantageous. We argue that these inconsistencies arise because ambidexterity's costs and benefits depend on firms' resource boundary conditions. Building on the distinction between non–scale-free resources that impose rivalry and trade-offs and scale-free resources—particularly intangible assets—that can be redeployed at low marginal cost, we develop a resource-contingent theory of ambidexterity. Using a panel of 1,314 U.S. public firms from 1980 to 2021, we show that under scarce non–scale-free resources, performance follows an inverted U-shape and ambidexterity prevails; under resource slack, the curve reverses and focused strategies dominate. We further demonstrate that while discontinuous jumps between orientations are typically costly, intangible assets buffer reconfiguration frictions and can convert discontinuous jumps into performance-enhancing moves. These findings reconcile prior mixed results by identifying resource redeployability as the microfoundation that conditions when balance, focus, or discontinuous change creates value.

Managerial Summary: Managers routinely confront the question of whether to balance exploration and exploitation or concentrate resources on one domain. Our results offer a clear and practical guide. When non–scale-free resources such as cash, talent, and managerial attention are scarce, aiming for a balanced ambidextrous posture delivers the highest performance. When resources are abundant, focused strategies outperform balance. We also find that incremental transitions are generally safer than discontinuous jumps; however, firms with strong intangible assets—patents, know-how, routines, and relational capital—can execute discontinuous jumps far more effectively. Managers anticipating major strategic reorientation should therefore invest in building intangible assets that enable rapid and less costly reconfiguration.

Keywords: ambidexterity, intertemporal transition, firm performance, firm resources, intangible assets

1 Introduction

A central challenge in strategic management is how organizations allocate their attention and resources between exploration, the search for new knowledge, experimentation, and innovation, and exploitation, the refinement and extension of existing capabilities (March, 1991; Levinthal and March, 1993). Getting this balance right is vital for survival and renewal, yet decades of research continue to offer contradictory evidence about which approach yields superior performance. Some studies find that balancing both activities, referred to as organizational ambidexterity, enhances outcomes (Uotila et al., 2009), while others show that strategic focus on one domain is more effective (Ebben and Jonhson, 2005; Luger et al., 2018). These empirical inconsistencies point to a central strategic paradox: if both balance and focus can be effective, when and under what conditions should firms pursue each?

Although scholars have made considerable progress, existing theories still struggle to explain why the same ambidexterity strategies yield different results across firms. Meta-analyses and reviews consistently find that there is no universal performance premium to ambidexterity, suggesting that contextual factors such as resource endowments, organizational structure, and market conditions critically shape outcomes (Junni et al., 2013; Raisch and Birkinshaw, 2008; Wenke et al., 2021). Yet the mechanism linking these contingencies to performance remains elusive. Ambidexterity requires substantial resource allocation and coordination, but the literature has not clarified how the type and availability of resources determine whether balance between exploration and exploitation or focus on either allocation strategy creates value. This gap calls for a framework that brings the nature of resources, rather than only their amount, to the center of the relationship between ambidexterity and performance.

In this article, we develop a resource-contingent theory of ambidexterity and performance that explains when balance, focus, or strategic change improves organizational outcomes. We argue that prior mixed results arise because resources have been treated as an enabling backdrop rather than as the mechanism that governs the costs and benefits of different strategic configurations. Ambidexterity is inherently costly because it requires firms to distribute financial, human, and cognitive resources across competing activities (Gupta et al., 2006). However, firms differ not only in the amount of slack they possess but also in the type of resources they hold. Building on

Levinthal and Wu (2010), we distinguish between non-scale-free resources, which are rivalrous and must be divided among uses, and scale-free resources, which are non-rivalrous or redeployable and can be reused across activities without depletion.

Non-scale-free resources such as managerial attention, specialized labor, and financial capital cannot be applied to multiple purposes simultaneously (Levinthal and Wu, 2010). In contrast, scale-free resources, including knowledge, routines, intellectual property, and reputation, can be redeployed across domains at low opportunity cost. This distinction, rooted in the resource-based view (Barney, 1991; Penrose, 1959) and dynamic capabilities theory (Eisenhardt and Martin, 2000; Teece et al., 1997), provides the microfoundation for explaining when balancing exploration and exploitation (e.g., ambidexterity) is costly and when it is advantageous. Firms differ not only in the quantity of resources they hold but also in their redeployability, and these differences fundamentally shape performance outcomes.

Resource characteristics determine how flexibly firms can allocate and reallocate effort. They shape not only whether firms balance exploration and exploitation at a given time but also how they adjust between them over time. Two behavioral dimensions capture how firms manage exploration and exploitation. The first, strategic orientation, describes how firms allocate effort between exploration and exploitation at a given moment, ranging from a complete focus to full ambidexterity. The second, temporal transition, describes how firms change their orientation over time, either incrementally through gradual re-balancing or discontinuously through abrupt reorientation (Kang and Kim, 2020). Each dimension is governed by distinct resource logics: the performance of strategic orientation depends on the availability of non-scale-free resources, specifically whether resources are scarce or abundant, while the performance of transition modes depends on the redeployability of scale-free resources, particularly intangible assets that enable reconfiguration.

This framework helps reconcile conflicting results in the ambidexterity literature. When non-scale-free resources are scarce, dividing them between exploration and exploitation creates opportunity costs, yet concentrating on one side leaves the firm vulnerable to change. Under scarcity, moderate ambidexterity provides a hedge, producing an inverted U-shaped relationship between ambidexterity and performance (Levinthal and Wu, 2010; Raisch and Birkinshaw, 2008). When resource slack is abundant, however, coordination costs dominate. Abundance allows firms to specialize more deeply without sacrificing performance elsewhere, resulting in a U-shaped relationship in which focused strategies outperform balanced ones.

The nature of resources also determines how firms adapt over time. Firms can shift between exploration and exploitation incrementally, through gradual adjustment, or discontinuously, through abrupt shifts in attention and resources (Kang and Kim, 2020; Swift, 2016). Incremental transitions minimize coordination costs and preserve stability, whereas discontinuous jumps enable rapid reorientation but often disrupt established routines and capabilities. Kang and Kim (2020) argue that discontinuous jumps generally underperform incremental ones due to high switching and coordination costs. Yet these costs are not fixed; they depend on the firm's stock of intangible assets. Intangible assets such as knowledge, routines, intellectual property, and relational capital are scale-free resources that can be reused across activities without depletion (Levinthal and Wu, 2010; Teece, 2007). They embed dynamic capabilities that allow firms to sense, seize, and reconfigure resources more efficiently (Eisenhardt and Martin, 2000). When intangibles are scarce, discontinuous jumps exacerbate disruption and inefficiency; when they are abundant, they buffer coordination costs, shorten adjustment periods, and enable smoother adaptation. Under such conditions, discontinuous jumps can even enhance performance, allowing firms to pivot quickly and seize new opportunities.

The effect of intangible assets also depends on the broader resource environment. Using free cash flow and R&D investment as indicators of non-scale-free resource abundance, we distinguish between contexts of scarcity and slack. When resources are scarce, opportunity costs are high, and reallocation is difficult, intangibles substitute for slack by absorbing shocks and enabling adaptation. When resources are abundant, however, tangible slack already provides flexibility, and the marginal value of intangibles diminishes. Thus, the performance of strategic transitions depends jointly on the quantity and type of resources a firm holds.

We test these hypotheses using a sample of 1,314 publicly listed U.S. firms between 1980 and 2021 and find that performance outcomes are contingent on both resource availability and resource type. Under scarcity, performance peaks at intermediate balances of exploration and exploitation; under slack, focus dominates. Moving from static to temporal change, discontinuous jumps are, on average, less effective than incremental transitions, but their performance penalty decreases and can reverse as intangible assets accumulate. This effect is strongest when non-scale-free resources are scarce, indicating that intangibles act as substitutes for slack and enablers of strategic renewal. Together, these findings provide a coherent explanation for when balance, focus, or radical reorientation leads to superior performance.

Our study advances a unified, resource-contingent theory of ambidexterity and performance that bridges the ambidexterity, resource-based, and dynamic capabilities literature. By introducing resource redeployability as the mechanism that explains when and why balance, focus, or radical change enhances performance, it reconciles decades of mixed findings within a single explanatory framework. We show that ambidexterity enhances performance under resource scarcity, that strategic focus yields superior outcomes under slack, and that intangible assets make discontinuous strategic change feasible, providing a resource-based microfoundation for dynamic ambidexterity.

For managers, our findings underscore that there is no universal recipe for striking a balance between exploration and exploitation. The optimal approach depends on both the quantity and type of resources the firm possesses. When resources are scarce, moderate ambidexterity yields the best performance by mitigating the risks of both extremes. When slack is abundant, focus delivers higher returns through specialization. Moreover, intangible assets enable firms to manage discontinuous shifts more effectively, transforming potential disruption into opportunity. Overall, the framework clarifies when to balance and when to focus, offering a resource-based explanation for how firms can adapt and sustain superior performance over time.

The article proceeds as follows. In Section 2, we discuss the literature background and develop our hypotheses. Section 3 describes our sample, variables, and the empirical strategy. Section 4 presents our results and discussion. Finally, Section 5 concludes with a discussion of theoretical and managerial implications, limitations, and avenues for future research.

2 Background and Hypotheses Development

Research on ambidexterity has documented multiple ways in which firms combine exploration and exploitation in their structures and processes. Structural ambidexterity separates exploratory and exploitative activities into distinct subunits coordinated at the top (Tushman and O'Reilly, 1996). Contextual ambidexterity relies on organizational systems and cultures that enable individuals to divide their attention across both domains within the same unit (Gibson and Birkinshaw, 2004). Temporal ambidexterity emphasizes shifts over time, either through cycles of experimentation and refinement or through punctuated changes (Brown and Eisenhardt, 1997; Burgelman, 2002; Romanelli and Tushman, 1994). Across these research streams, ambidexterity is no longer viewed as a single structural choice but as a set of mechanisms that allow firms to balance, separate, or sequence exploration and exploitation.

The performance consequences of these mechanisms, however, remain contested. Early empirical work suggested that engaging in both exploration and exploitation can improve firm performance (Wang and Li, 2008). Subsequent studies refined this view by showing that the ambidexterity-performance relationship is often non-linear: moderate ambidexterity can outperform extreme specialization, but the benefits reduce or even reverse at high levels of balance (Cao et al., 2009; Uotila et al., 2009). Other studies find that focused strategies on either exploration or exploitation yield superior outcomes in some contexts, especially when firms can rely on strong complementarities and coherent configurations (Ebben and Jonhson, 2005; Luger et al., 2018). Meta-analyses and literature reviews conclude that there is no universal performance premium to ambidexterity and call for a better understanding of boundary conditions (Junni et al., 2013; Raisch and Birkinshaw, 2008; Wenke et al., 2021).

Another stream of the literature has focused on resources as an important contingency. Studies of organizational slack and innovation show that moderate slack can stimulate experimentation, whereas excessive slack leads to complacency and misallocation (Nohria and Gulati, 1996; Tan and Peng, 2003). Work on ambidexterity similarly points to the enabling role of financial, human, and social capital, as well as absorptive capacity, in sustaining simultaneous exploration and exploitation (Cohen and Levinthal, 1990; Raisch and Birkinshaw, 2008; Solís-Molina et al., 2018; Wenke et al., 2021). From a dynamic capabilities perspective, firms with strong sensing, seizing, and reconfiguring capabilities are better able to orchestrate ambidextrous activities and adapt to change (Eisenhardt and Martin, 2000; Teece et al., 1997; Teece, 2007). Yet this research typically treats resources as a one-dimensional endowment, focusing on the amount of slack firms possess rather than on the types of resources and their redeployability.

Concurrently, additional research examines how firms move between exploration and exploitation over time. Temporal perspectives show that firms often combine simultaneous balance with intertemporal shifts, gradually altering the emphasis between exploration and exploitation (Lavie and Rosenkopf, 2007; Lavie et al., 2010; Raisch et al., 2009; Luger et al., 2018). Other studies focus on more radical temporal transitions, highlighting the risks of abrupt shifts in innovation portfolios and R&D focus (Mudambi and Swift, 2014; Swift, 2016). Kang and Kim (2020) contrast incremental transitions, which adjust the exploration–exploitation mix gradually, with discontinuous jumps, which involve abrupt shifts between these activities. They show that incremental transitions generally outperform discontinuous jumps and argue that the latter impose high switching and coordination costs, especially for resource-constrained firms.

Taken together, this literature reveals three points of agreement and one key gap. First, there is a broad consensus that both exploration and exploitation are necessary for long-term performance, but the optimal configuration depends on the context (Gupta et al., 2006; Raisch and Birkinshaw, 2008). Second, resources matter. Slack, capabilities, and absorptive capacity shape whether firms can sustain ambidexterity and how they adapt over time (Nohria and Gulati, 1996; Eisenhardt and Martin, 2000; Wenke et al., 2021). Third, the temporal pattern of change (e.g., incremental versus discontinuous) has distinct performance implications (Mudambi and Swift, 2014; Kang and Kim, 2020). The remaining gap is that we still lack a unified framework that links the type and amount of resources to both (i) the performance of different exploration–exploitation orientations at a point in time and (ii) the performance of different transition modes between orientations. Prior work has largely treated transition costs as fixed and resource effects as scalar, rather than distinguishing between rivalrous resources that must be divided between activities and redeployable resources that can be reused across activities.

Our study addresses this gap by integrating ambidexterity research with the resource-based view and the dynamic capabilities perspective. Building on Levinthal and Wu's (2010) distinction between non-scale-free resources, which are rivalrous and must be split among uses, and scale-free resources, which are redeployable at low marginal cost, we theorize how resource regimes shape both static strategic orientations and temporal transitions. We focus on intangible assets as key scale-free resources that embed dynamic capabilities and facilitate rapid reconfiguration (Eisenhardt and Martin, 2000; Teece, 2007) to develop the following hypotheses.

2.1 Exploration-exploitation orientation and non-scale-free resources

Prior research has shown that the relationship between a firm's exploration–exploitation mix and performance is often nonlinear, but the direction of curvature varies across studies. Some find that ambidexterity outperforms exploration or exploitation focus, consistent with an inverted U-shaped relation (He and Wong, 2004; Uotila et al., 2009; Cao et al., 2009). Others report that firms with a strong focus on either exploration or exploitation can outperform those that spread their attention across both domains, especially when complementarities favor coherent strategic positions (Ebben and Jonhson, 2005; Luger et al., 2018). These conflicting findings are difficult to reconcile if we assume that all firms face similar resource conditions.

We propose that the availability of non–scale-free resources is a key contingency that changes the shape of the exploration–exploitation–performance relationship. Non–scale-free resources such as managerial attention, specialized labor, and financial capital are rivalrous inputs that cannot be used in multiple activities at the same time (Levinthal and Wu, 2010). When these resources are scarce, exploration and exploitation compete directly for the same resources. Fully committing scarce non–scale-free resources to exploitation yields short-term efficiency but starves exploratory efforts, allowing the firm's knowledge base and adaptive capacity to erode and increasing the risk of becoming locked into obsolete routines (Levinthal and March, 1993). Fully committing them to exploration consumes limited cash, attention, and talent on uncertain projects, leaving too little capacity to scale promising ideas or fund current operations (March, 1991). In this regime, the dominant problem is downside risk; neglecting either domain can push the firm's capability below a viable threshold.

A balanced orientation, ambidexterity, mitigates this risk. Allocating a portion of scarce non-scale-free resources to exploitation keeps the core business viable and generates cash to support ongoing operations; allocating a portion to exploration sustains search and learning processes that preserve options for renewal. Ambidexterity thus acts as a hedge that keeps both capability systems alive, even if neither is fully optimized. Under scarcity, we therefore expect that ambidexterity maximizes a firm's performance, whereas extreme focus on either exploration or exploitation reduces performance.

When non-scale-free resources are abundant, the binding constraint shifts from opportunity costs to coordination and dilution costs. Slack relaxes immediate trade-offs between exploration and exploitation (Bourgeois and Singh, 1983; Nohria and Gulati, 1996). Firms can fund exploratory initiatives without starving the core, and they can maintain exploitative routines without crowding out innovation. In this setting, the main risk is not that one capability will fall below a critical threshold, but that resources will be spread too thinly across competing logics. Complementarities among strategy, structure, and processes often favor specialized configurations in which activities, incentives, and routines are aligned around either an exploratory or an exploitative focus (Milgrom and Roberts, 1995; Porter, 1996). Under organizational slack, firms can absorb the costs of deep specialization and can later reallocate resources or switch orientation if needed. A mid-range, ambidextrous orientation may then be least effective because it fails to achieve sufficient depth in either domain while still incurring the integration and coordination costs of trying to do both.

This reasoning implies that non–scale-free resource availability reverses the curvature of the exploration–exploitation–performance relationship in which ambidexterity is most valuable under scarcity, whereas focus yields superior returns when those resource allocation trade-offs are relaxed. We, therefore, hypothesize that:

Hypothesis 1a (resource scarcity). When non-scale-free resources are scarce, firm performance is highest at intermediate balances of exploration and exploitation and declines toward extremes.

Hypothesis 1b (resource slack). When non-scale-free resources are abundant, firm performance is lowest at intermediate balances of exploration and exploitation and increases toward more focused orientations.

2.2 Intertemporal transition and scale-free resources

Beyond the static trade-off between balance and focus on exploration and exploitation, firms also need to adjust their orientation over time. As technologies, competitors, and opportunities evolve, firms may shift gradually or move more abruptly between exploration and exploitation. Prior work distinguishes between incremental transitions, in which firms make small, continuous adjustments in their exploration–exploitation orientation, and discontinuous jumps, in which they undertake large, abrupt reallocations of attention and resources from one domain to the other (Kang and Kim, 2020; Swift, 2016). Incremental transitions tend to preserve overlap between past and future activities. They build on existing structures and routines, and therefore keep coordination and learning costs relatively low. Discontinuous jumps, by contrast, disrupt established patterns. They often require redesigning organizational interfaces, reconfiguring portfolios, and shifting identities, which generates substantial switching and coordination costs. Consistent with this logic, Kang and Kim (2020) find that, on average, discontinuous jumps underperform incremental transitions.

We extend this prior research and argue that the performance gap between incremental and discontinuous transitions is not fixed. It depends on the firm's stock of intangible assets, which we conceptualize as key scale-free resources. Intangible assets such as technological knowledge, organizational routines, patents, brand equity, and relational capital can be redeployed across multiple activities without being depleted (Griliches, 1990; Hall et al., 2005; Levinthal and Wu, 2010).

From a dynamic capabilities perspective, these assets embody the firm's ability to sense opportunities, seize them, and reconfigure resource bundles in response to change (Eisenhardt and Martin, 2000; Teece, 2007). When intangible assets are limited, firms lack codified routines, shared language, and modular architectures that would make reconfiguration easier. Under such conditions, discontinuous jumps deepen disruption. Therefore, managers must design new processes and coordination mechanisms largely from scratch, and the organization experiences a deeper and longer performance decline. Incremental transitions are therefore likely to dominate, because they allow adaptation while preserving much of the existing organizational fabric.

As intangible assets accumulate, the logic changes. Rich stocks of knowledge, routines, and relational capital provide the platform and interfaces that can be reused when activities are reallocated. These scale-free resources compress the time and effort needed to realign structures and processes after a jump and help restore coherence more quickly. They also increase investor confidence that the firm can execute radical shifts effectively, which is reflected in market valuations. In firms with deep intangible assets, discontinuous jumps can thus become an effective mechanism for rapid strategic renewal, allowing firms to pivot quickly toward promising opportunities while containing the costs of disruption.

This reasoning implies that intangible assets moderate the performance consequences of different temporal transition modes. At low levels of intangibles, the reconfiguration costs of discontinuous jumps are high, and incremental transitions yield superior performance. As intangible assets increase, these costs fall, the recovery from jumps becomes faster, and the relative performance of discontinuous transitions improves and can eventually surpass that of incremental change. We therefore hypothesize:

Hypothesis 2 (moderating effect of intangible assets). When intangible assets are low, discontinuous jumps are associated with lower performance than incremental transitions; whereas as intangible assets increase, discontinuous jumps become associated with higher performance than incremental transitions.

2.3 Non-scale-free resources, scale-free resources, and temporal transitions

The moderating role of intangible assets on transition modes is unlikely to be uniform across firms. It should depend on the broader non–scale-free resource environment described above. When non–scale-free resources such as cash, managerial attention, and specialized labor are scarce, firms have very little slack to absorb the misfit and inefficiencies that follow a discontinuous jump. In these conditions, intangible assets and slack are partly substitutes. Because intangibles are scale-free and redeployable, they provide problem-solving templates, shared language, and coordination capacity that allow firms to orchestrate large reallocations of resources without extensive financial or human buffers (Levinthal and Wu, 2010; Teece, 2007). A marginal increase in intangible assets therefore sharply reduces the disruption costs of discontinuous jumps for resource-constrained firms and can even make abrupt shifts performance-enhancing relative to incremental transitions.

When non–scale-free resources are abundant, by contrast, firms already possess tangible slack that can cushion the costs of transition. Resource-rich firms can afford parallel structures, bridging roles, and temporary duplication of activities while they adjust their exploration–exploitation mix (Bourgeois and Singh, 1983; Nohria and Gulati, 1996). In such settings, discontinuous jumps are less risky even with modest intangible assets, because slack itself absorbs part of the coordination losses. Additional intangibles remain valuable, but their incremental effect on the relative performance of jumps versus incremental transitions is smaller. Put differently, when firms already enjoy ample non–scale-free slack, the unique buffering role of intangible assets in radical reconfiguration is attenuated.

This logic suggests that the moderating effect of intangible assets on transition modes should be strongest under scarcity and weaker under slack leading to the following hypotheses:

Hypothesis 3a (resource scarcity). When non–scale-free resources are scarce, the moderating effect of intangible assets on the relationship between transition mode and firm performance is amplified such that, at low levels of intangible assets, discontinuous jumps are associated with lower performance than incremental transitions, whereas as intangible assets increase, discontinuous jumps become associated with higher performance than incremental transitions.

Hypothesis 3b (resource slack). When non–scale-free resources are abundant, the moderating effect of intangible assets on the relationship between transition mode and firm performance is attenuated such that increases in intangible assets do not materially change the performance difference between discontinuous jumps and incremental transitions.

3 Empirical Methods

3.1 Data sources and sample

To test our hypotheses, we consider a sample of manufacturing firms (SICs 2000 to 3999) over the period between 1980 and 2021. We collected financial and accounting data from Compustat, stock price and shares outstanding from CRSP, and patent data from the U.S. Patent and Trademark Office, using the NBER patent database to link patents to firms. Our sample selection approach is similar to that of Almeida and Campello (2007). We eliminate firm-years where beginning-of-period gross fixed assets (PPE) are below $5 million (to eliminate very small firms), those with inflation-adjusted total asset growth exceeding 100% (to avoid extreme growth, typically due to mergers), and those observations with a negative Tobin's Q (since our performance measure would be ill-defined). Finally, we require that each firm is observed for at least five years to avoid survivorship biases. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. These steps yield a broad sample of U.S. industrial and high-technology companies observed over four decades, providing substantial variation in strategic orientation, resources, and performance. Our final sample consists of 1,314 firms and 15,074 firm-year observations.

3.2 Dependent variable

Our performance outcome is Tobin's Q, a market-based measure that captures both current profitability and expectations of future cash flows. We compute Tobin's Q using Compustat and CRSP data as

$$Q_{it} = \frac{PRCC_{it} \times CSHO_{it} + PSTKL_{it} + LCT_{it} - ACT_{it} + INV_{it} + DLTT_{it}}{AT_{it}} \tag{1}$$

where $PRCC$ is the share price, $CSHO$ the number of common shares outstanding, $PSTKL$ the liquidation value of preferred stock, LCT and ACT current liabilities and current assets, INV inventories, $DLTT$ long-term debt, and AT total assets. Consistent with prior ambidexterity studies, we relate firms' exploration–exploitation configuration in year t to Tobin's Q in year $t+1$ to allow for a short lag between strategic decisions and market valuation.

3.3 Independent variables

First, to capture a firm's orientation toward exploration versus exploitation, we construct a patent-based measure that distinguishes between exploratory and exploitative innovations. For each firm-year, we classify the firm's granted patents into two categories. Exploratory patents are those that introduce the firm into new technological classes or combine existing classes in novel ways, while exploitative patents represent incremental developments within technological domains in which the firm has already built experience. Operationally, if a patent's technology classes have not appeared in the firm's prior patent portfolio, we code it as exploratory; if its classes have appeared before, we code it as exploitative.

Let E_{it} and X_{it} denote the number of exploratory and exploitative patents for firm i in year t. We then define the firm's focus ratio as:

$$f\_ratio_{it} = \frac{E_{it} - X_{it}}{E_{it} + X_{it}}.$$

This index ranges from -1 (all exploitation) to $+1$ (all exploration), with values near 0 indicating a more balanced, ambidextrous orientation. Because the ratio is scale-free, firms with the same relative mix but different absolute patent counts receive the same value. To allow for non-linear effects of balance on performance, we include both f_ratio_{it} and its square in the regressions.

Similar to Kang and Kim (2020), we construct a strategic orientation trend. For each firm-year, we regress the focus ratio on time over a centered five-year window (years $t-2$ to $t+2$). The slope of this regression captures whether the firm has been drifting toward exploration (positive values) or exploitation (negative values). We include this variable as a control to separate level effects from recent directional shifts in orientation.

Second, to measure temporal transition and examine how firms move between exploration and exploitation, we distinguish between discontinuous jumps and incremental transitions. Both measures are defined from changes in the focus ratio.

As in Kang and Kim (2020), a *discontinuous jump* occurs when a firm switches from exclusive commitment to one activity to exclusive commitment to the other. We set *Discontinuous Jump* $= 1$ in year t if the firm's focus ratio equals -1 (all exploitation) in both $t-2$ and $t-1$ and $+1$ (all exploration) in t; we also treat the symmetric pattern (two years of $+1$ followed by -1) as a jump. These events represent radical strategic reorientations in which the firm effectively tears down one capability system in favor of the other.

An *incremental transition* captures more gradual rebalancing between exploration and exploitation. We set *Incremental Transition* $= 1$ in year t if, in years $t-2$, $t-1$, and t, the firm exhibits a mixed orientation (focus ratio strictly between -1 and $+1$) and there is a meaningful change in the focus ratio between $t-1$ and t. Firms experiencing incremental transitions thus remain ambidextrous over the three-year window but shift the emphasis between exploration and exploitation.

In any given year a firm can experience at most one of these transition types, and most years involve no temporal transition. The two indicators allow us to compare the performance consequences of discontinuous versus incremental shifts in exploration–exploitation orientation.

Third, our theoretical framework emphasizes the distinction between non-scale-free resources, which are rivalrous and must be allocated between activities, and scale-free resources, which can be redeployed at low marginal cost. We operationalize non-scale-free resource availability using a composite index based on free cash flow and R&D expenditure.

Following Levinthal and Wu (2010), we compute each firm's *Firm Resources* as the Euclidean distance of its normalized free cash flow and R&D investment in year t:

$$Firm\ Resource_{it} = \sqrt{\widetilde{FCF}_{it}^{2} + \widetilde{R\&D}_{it}^{2}} \tag{2}$$

where each component – $\widetilde{FCFit}$ and $\widetilde{R\&Dit}$ – is normalized to be comparable. Higher values indicate more abundant financial and innovation resources available to be allocated across exploration and exploitation. On this basis, we create *Low Resources* and *High Resources* indicators by splitting the distribution at trimmed percentiles. *Low Resources* equals 1 for observations below the 47.5th percentile of the index and *High Resources* equals 1 for those above the 52.5th percentile. This design sharpens the contrast between resource-scarce and resource-rich regimes while preserving most observations in each group.

To capture scale-free resources, we use the firm's stock of *Intangible Assets*, measured as the natural logarithm of the book value of intangible assets (Compustat item INTAN). This measure includes patents, trademarks, goodwill, and other knowledge-based and organizational capital that can typically support multiple activities simultaneously. In our framework, higher intangible assets proxy for deeper stocks of reusable knowledge and routines that can buffer coordination and switching costs when firms reconfigure their exploration–exploitation orientation.

3.4 Control variables

We include a set of control variables to account for alternative firm- and industry-level factors that may influence Tobin's Q and covary with exploration–exploitation behavior. Our goal is to capture potential confounding factors that may affect performance, temporal transitions, and resource availability.

At the firm level, we control for the overall non–scale-free resource endowment using the continuous *Firm Resources* index described above. In addition to defining the high- and low-resource regimes, we include this index directly to net out the main effect of resource abundance on performance. Firms with more slack are likely to have higher Tobin's Q regardless of their exploration–exploitation stance, and failing to account for this could bias the estimated coefficients on orientation and transition terms. Including the continuous Firm Resources measure allows us to examine how the *shape* of the orientation–performance relationship and the relative performance of transition modes vary across resource regimes, over and above the simple fact that "rich" firms tend to be more highly valued.

We also control for firm growth in scale through *Firm Growth Rate*, measured as the annual percentage change in total assets from year $t-1$ to t. This variable captures how quickly the firm is expanding its asset base, reflecting investment dynamics and growth opportunities. High asset growth may be associated with higher Tobin's Q because it signals expansion, new investments, or acquisitions that investors value positively. At the same time, rapid growth can strain coordination and integration, potentially interacting with exploration–exploitation choices. Controlling for *Firm Growth Rate* ensures that our estimates for orientation, resource contingencies, and transition modes are not simply absorbing the performance effects of being in a high-growth versus low-growth phase.

To capture financial conditions, we include *Free Cash Flow Margin*, *Liquidity*, and *Leverage*. Free Cash Flow Margin is computed as free cash flow (cash flow from operations minus capital expenditures) divided by total revenue, representing the share of sales available after covering capital expenditures. A higher margin indicates greater internal liquidity and financial slack that can ease financing constraints and support exploration and exploitation initiatives. However, consistent with agency theory, excessive free cash flow may also enable inefficient or value-destroying investments, making its performance implications ambiguous Jensen (1986). By controlling for *Free Cash Flow Margin*, we account for differences in internal funding capacity that might otherwise confound ambidexterity effects. *Liquidity* is measured as the current ratio (current assets divided by current liabilities), a standard indicator of short-term financial health. Firms facing acute liquidity constraints may underperform or be unable to invest in innovation; controlling for the current ratio helps isolate our effects from performance issues due to short-term financial distress (Bourgeois and Singh, 1983). *Leverage*, defined as long-term debt divided by total assets, captures capital structure and financial risk. Highly leveraged firms face different performance pressures and risk of distress, which can affect both strategic choices and market valuation (Hitt et al., 1997). Including leverage reduces the risk that our results are driven by systematic differences in debt load across exploration–exploitation configurations.

We further control for the scale and intensity of firms' innovation activity beyond the exploration–exploitation orientation. *Total Patents* is the number of patents granted to the firm in year t, reflecting overall innovative output and exposure to technology-intensive industries. Firms with more patents may have higher Tobin's Q simply because they are more innovative; controlling for patent count helps ensure that the effect of the focus ratio is not driven by the sheer volume of inventions (Hall et al., 2005). *R&D Intensity* is measured as R&D expenditures divided by sales, capturing the firm's current commitment to innovation relative to its size. R&D intensity is a standard control in innovation and performance studies and proxies for differences in innovation strategy and spending levels (Nohria and Gulati, 1996). *R&D Stock* represents the firm's accumulated recent R&D efforts, operationalized as the logarithm of the sum of R&D expenditures over the previous five years. This stock approximates the firm's built-up technological knowledge and capabilities and is often associated with higher market valuations (Hall et al., 2005). Including both *R&D Intensity* and *R&D Stock* allows us to distinguish between short-term R&D efforts and longer-term accumulation of knowledge.

To account for learning from prior reconfiguration, we include *Past Transition Experience*, defined as the cumulative count of prior exploration–exploitation transitions (of either type) undertaken by the firm up to year t. Firms that have rebalanced between exploration and exploitation multiple times may have developed routines or dynamic capabilities that allow them to manage change more efficiently, which could influence performance (Zollo and Winter, 2002). Controlling for past transition experience ensures that our estimates for discontinuous jumps and incremental transitions are not simply capturing the learning curve.

Finally, we add a small set of industry-level controls. *Industry Tobin's Q* is the average Q of all firms in the same two-digit SIC industry, capturing sector-specific growth expectations and valuation norms (Mc Gahan and Porter, 1997). The *Herfindahl–Hirschman Index* (HHI), computed as the sum of squared market shares in each industry, measures industry concentration and competitive structure. Both factors can influence firm performance independently of a firm's exploration–exploitation configuration. By controlling for industry Q and HHI, we reduce the risk that our results are driven by sector-wide shocks or structural industry differences rather than by firm-level ambidexterity and resource conditions.

All continuous control variables are winsorized at the 1st and 99th percentiles to limit the influence of outliers and are log-transformed where appropriate (e.g., R&D Stock, Free Cash Flow, Intangible Assets) to mitigate skewness. Controls are measured in year t, aligned with the timing of the independent variables, and related to Tobin's Q in year $t+1$, so that they capture information available to investors at the time strategic orientation and transitions are observed.

3.5 Descriptive statistics

Table 1 reports descriptive statistics (N, means, standard deviations, minima, and maxima) for the key variables based on the full sample (1980–2021). Tobin's Q has a mean of 1.51 (SD = 1.34), which is consistent with prior evidence for diversified U.S. firms and indicates that, on average, the market value of the sample firms modestly exceeds the replacement cost of their assets. The mean focus ratio (f_ratio) is -0.70 (SD = 0.53), with the full range spanning -1 to $+1$, suggesting that firms typically lean toward exploitation in a given year. The corresponding mean of f_ratio^2 is 0.78 (SD = 0.32), indicating that a substantial share of observations lie near the extremes of the exploration–exploitation spectrum (i.e., $f\_ratio \approx -1$ or $f\_ratio \approx +1$) rather than around a balanced orientation. This concentration at the extremes provides the variation needed to detect potential curvilinear performance effects of strategic orientation. The mean value of *Strategic Orientation* (the five-year f_ratio trend) is slightly negative (-0.06, SD = 0.22), implying a modest overall drift toward exploitation over time; however, the small magnitude suggests that most firms do not dramatically alter their exploration–exploitation balance in the short run.

Turning to the transition variables, *Discontinuous Transition* is rare: the indicator has a mean of 0.004 (SD = 0.07), so fewer than 0.5% of firm–year observations involve an abrupt switch between exploration and exploitation. *Incremental Transition* is substantially more common, with a mean of 0.078 (SD = 0.27), or about 8% of observations, implying that firms are roughly twenty times more likely to adjust their innovation portfolios gradually than to undertake discontinuous shifts. The low incidence of discontinuous transitions underscores the value of the long panel: observing a sufficient number of such events would be difficult in a shorter time frame, whereas the four-decade window yields a meaningful number of cases.

[Insert Table 1 around here]

The resource variables exhibit considerable variation. The *Firm Resources* index has a mean of 595.28 (SD = 2,477.04), with values ranging from 0.21 to 95,501.23. This pattern reflects substantial heterogeneity in firms' slack and innovation-related financial resources: some firm–years exhibit very limited free cash flow and R&D, whereas others display very high levels of both. By construction, this index is non-negative, and its minimum in the sample is greater than zero because it requires non-missing data for both components. The *Intangible Assets* variable (in logs) has a mean of 5.18 (SD = 2.46), with values ranging from approximately -4.96 to 11.66. The mean corresponds to intangible assets on the order of $\exp(5.18) \approx 180$ million USD, and a one–standard deviation difference implies roughly an eleven-fold change in intangible asset levels. The wide variation in intangible assets suggests that some firms (e.g., in technology-intensive industries or with extensive intellectual property) hold substantial knowledge assets, whereas others report very limited intangibles, thereby providing the contrast needed for our moderation analyses.

Innovation-related controls also show meaningful variation. *R&D Intensity* has a mean of 0.44 (SD = 3.53), with a maximum of 65.18, indicating a highly skewed distribution in which most firm–years exhibit low R&D-to-sales ratios and a small number display very high intensities. *R&D Stock* (logged) has a mean of 5.89 (SD = 1.98), again consistent with substantial heterogeneity in accumulated innovative capabilities. Total patents average 60.74 (SD = 211.49), with a maximum of 4,842, reinforcing the presence of a few highly patent-intensive firms. The correlation matrix in Table 2 indicates that multicollinearity is not a significant concern: while firms with higher R&D intensity tend to have more patents and higher intangible assets, the magnitudes of these correlations are modest, and variance inflation factors for the regression models are well below commonly used thresholds.

[Insert Table 2 around here]

Overall, the descriptive statistics indicate that most firms operate closer to the exploitation end of the exploration–exploitation continuum, that truly radical reorientation events are infrequent, and that there is substantial variation in resource conditions, knowledge stocks, and financial positions across observations. These features create an empirical setting well suited to testing how performance (Tobin's Q) responds to different strategic orientations and transition behaviors under varying resource contingencies.

3.6 Empirical specification

To test our hypotheses, we estimate panel regression models that relate a firm's exploration–exploitation orientation to its performance while controlling for unobserved heterogeneity across firms and over time. All specifications include firm fixed effects (α_i) and year fixed effects (λ_t). The firm fixed effects absorb time-invariant differences across firms (e.g., industry affiliation, historical culture, or baseline innovation capability), so identification comes from within-firm changes in orientation and resources. The year fixed effects capture macroeconomic, regulatory, and technological shocks that are common to all firms in a given year. We cluster standard errors at the firm level to allow for arbitrary heteroskedasticity and serial correlation within firms over time (Petersen, 2008).

Hypotheses 1a and 1b concern the shape of the relationship between exploration–exploitation balance and firm performance under different resource conditions. Our baseline specification is:

$$Q_{it} = \alpha_i + \lambda_t + \beta_1\, f\_ratio_{it} + \beta_2\, f\_ratio_{it}^2 + \Gamma' X_{it} + \varepsilon_{it}, \tag{3}$$

where Q_{it} is Tobin's Q for firm i in year t; f_ratio_{it} is the exploration–exploitation focus ratio defined above; X_{it} is a vector of control variables for firm i in year t (Section 3.4); and ε_{it} is an idiosyncratic error term. The coefficient β_1 captures the linear effect of tilting toward exploration (positive *f_ratio*) versus exploitation (negative *f_ratio*). The coefficient β_2 captures the curvature of the performance function with respect to exploration–exploitation balance. Hypothesis 1a predicts an inverted U-shape in resource-scarce conditions (performance peaks at intermediate *f_ratio*, implying $\beta_2 < 0$), whereas Hypothesis 1b predicts a U-shape in resource-rich conditions (extreme focus outperforms balance, implying $\beta_2 > 0$).

To evaluate these predictions, we estimate Equation 3 separately for low-resource and high-resource subsamples using the *High Resources* indicator described earlier. This split-sample approach allows both the linear and quadratic effects to differ across different resources' regimes and provides a direct test of whether the curvature of the orientation–performance relationship changes sign between constrained and slack-rich firms. As a robustness check, we also estimate pooled models in which f_ratio_{it} and $f\_ratio_{it}^2$ are interacted with the *High Resources* indicator; the interaction terms yield inferences that are consistent with the split-sample results.

Hypotheses 2 and 3 focus on how transition modes between exploration and exploitation affect performance and how these effects depend on the firm's intangible asset base and resource environment. To examine these contingencies, we augment the model to include indicators for the type of transition and their interactions with intangible assets:

$$
\begin{aligned}
Q_{it} = \alpha_i + \lambda_t &+ \theta_1 \,\text{Incremental Transition}_{it} + \theta_2 \,\text{Discontinuous Transition}_{it} \\
&+ \theta_3 \left(\text{Incremental Transition}_{it} \times \text{Intangible Assets}_{it}\right) \\
&+ \theta_4 \left(\text{Discontinuous Transition}_{it} \times \text{Intangible Assets}_{it}\right) + \Gamma' X_{it} + \xi_{it},
\end{aligned} \tag{4}
$$

where *Incremental Transition* and *Discontinuous Transition* are the transition indicators defined earlier, and *Intangible Assets* is the (logged) measure of the firm's intangible asset base. In this specification, θ_1 and θ_2 capture the average performance effects of undertaking an incremental or discontinuous transition when intangible assets are at their mean, whereas θ_3 and θ_4 capture how these effects vary with the level of intangibles.

Hypothesis 2 (H2) posits that as a firm's intangible assets increase, the performance gap between discontinuous and incremental transitions narrows and may ultimately reverse. When intangible assets are low, discontinuous transitions are expected to underperform incremental transitions because coordination and switching costs cannot be offset by reusable knowledge. At high levels of intangibles, discontinuous transitions should no longer underperform and may even outperform incremental shifts. In the context of Equation 4, this logic implies that the Tobin's Q–intangibles slope for discontinuous transitions (θ_4) should exceed the corresponding slope for incremental transitions (θ_3). We assess H2 by examining the sign and significance of θ_3 and θ_4, testing whether $\theta_4 - \theta_3 > 0$, and computing the implied crossover point at which the predicted performance of discontinuous transitions equals that of incremental transitions. These estimates are reported together with marginal effects evaluated at representative values of intangible assets.

Hypothesis 3 (H3) adds the resource regime as an additional contingency. H3a predicts that under resource scarcity, intangible assets are especially important for discontinuous reconfiguration, so the difference between the Tobin's Q–intangibles slopes for discontinuous and incremental transitions should be large and positive. H3b predicts that under resource slack, other flexible resources already cushion transition costs, so additional intangibles provide limited incremental benefit; in this case, the slopes for discontinuous and incremental transitions should not differ significantly. To test H3, we re-estimate Equation 4 separately for low-resource and high-resource subsamples, yielding two sets of interaction coefficients, $(\theta_3^{\text{low}}, \theta_4^{\text{low}})$ and $(\theta_3^{\text{high}}, \theta_4^{\text{high}})$. Consistent with H3a, we expect $\theta_4^{\text{low}} > \theta_3^{\text{low}}$, indicating that intangibles materially enhance the performance of discontinuous transitions relative to incremental transitions when other resources are constrained. Consistent with H3b, we expect $\theta_4^{\text{high}} \approx \theta_3^{\text{high}}$, implying no meaningful slope difference under slack conditions. We present these split-sample results alongside plots of predicted Tobin's Q for each transition type across the observed range of intangible assets in each resource regime, following recommended practices for probing interaction effects (Aiken et al., 1991).

Taken together, these specifications implement a fixed-effects panel regression framework with a comprehensive set of controls, nonlinear terms, and theoretically motivated interactions. The use of firm and year fixed effects, combined with firm-clustered standard errors, helps ensure that our inferences about exploration–exploitation balance and transition modes are not confounded by unobserved heterogeneity or common temporal shocks. The next section reports the regression results and evaluates the extent to which the evidence supports each hypothesis.

4 Results and Discussion

4.1 Exploration-Exploitation Balance under Resource Contingencies

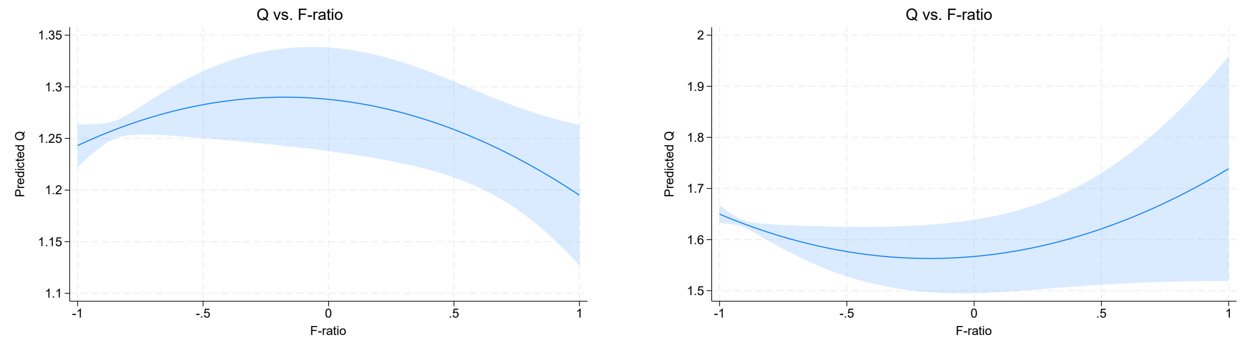
Table 3 reports estimates from the quadratic specification linking a firm's exploration–exploitation orientation (*f_ratio*) to Tobin's Q. In the full sample, the coefficient on f_ratio^2 is small and not statistically different from zero, consistent with the idea that pooling firms across heterogeneous resource environments averages out countervailing curvature. When we split the sample by resource regime, a clearer pattern emerges.

[Insert Table 3 around here]

Among low-resource firms, the coefficient on f_ratio^2 is negative and statistically significant, indicating an inverted U-shaped relationship between ambidexterity and performance. Under resource scarcity, Tobin's Q is highest at intermediate levels of exploration and exploitation and declines as firms move toward either extreme. Leaning too far toward exploration or exploitation aggravates trade-off inefficiencies, consistent with learning-myopia arguments and the notion of organizational “fit” (Levinthal and March, 1993; Porter, 1996). Finite, non–scale-free resources (e.g., managerial attention, specialized talent, and cash) cannot be stretched to support strong commitments at both poles, so highly unbalanced strategies incur opportunity costs and coordination frictions that reduce performance.

By contrast, among high-resource firms, the coefficient on f_ratio^2 is positive and statistically significant, implying a U-shaped relationship. When ample slack and redeployable resources are available, firms no longer face binding resource trade-offs; coordination costs can be absorbed, and the main risk becomes under-commitment. In these enriched contexts, more focused strategies at either pole (strongly exploration- or exploitation-oriented) outperform intermediate mixes that diffuse attention and forgo specialization benefits. The sign reversal in curvature between low- and high-resource regimes supports H1a and H1b: the performance implications of a firm's exploration–exploitation mix are contingent on its resource base. A formal test of differences in the curvature terms confirms that the effect of f_ratio^2 differs significantly across the two regimes.

The economic magnitude of these effects is meaningful. In the low-resource subsample, a firm near the balanced midpoint ($f\_ratio \approx 0$) is predicted to achieve a Tobin's Q roughly 15–20% higher than if it were to concentrate fully on either exploration or exploitation. In the high-resource subsample, the pattern reverses: a firm that commits strongly to one side (with f_ratio at an extreme) attains a Tobin's Q about 25–30% higher than a similar firm maintaining a 50/50 balance. Figure 1 provides a graphical interpretation of Table 3 estimations. Under resource scarcity (Figure 1, Panel A), predicted Q is highest at an approximately even split between exploration and exploitation and declines as the firm's orientation becomes more extreme. Under resource slack (Panel B), performance is lowest at an ambidexterity orientation and increases as the firm focuses more fully on one expliration or exploitation, yielding superior outcomes at the extremes. In both subsamples, the estimated turning points lie well within the observed range of f_ratio values, satisfying recommended diagnostics for U-shaped relationships in management research (de Castro et al., 2017). These results highlight a resource contingency effect of ambidexterity on firm's performance. In low-resource settings, ambidexterity hedges the risks of the extremes, avoiding both the myopia of over-exploitation and the futility of over-exploration, whereas in high-resource settings, firms can absorb the coordination costs of focus and capture the returns to specialization.



(a) Low resources

(b) High resources

Figure 1: Predicted Tobin's Q over the exploration–exploitation orientation (*f_ratio*), by resource regime. Panel A shows an inverted-U under low resources; Panel B shows a U-shape under high resources.

4.2 The Moderating Role of Intangible Assets in Intertemporal Transitions

Column 1 of Table 4 presents the estimates of the interaction model between intertemporal transitions–*Discontinuous Jump* and *Incremental Transition* – and *Intangible Assets*. The results support our theoretical predictions. First, the *Discontinuous Jump* coefficient is negative in the full sample, consistent with the idea that abruptly reorganizing firm's innovation resources and activities creates temporary misfit and coordination losses. Second, the *Discontinuous Jump* $\times$ *Intangible Assets* interaction is positive and statistically significant: firms with deeper knowledge stocks experience a smaller performance penalty from a discontinuous jump and, at sufficiently high levels of intangibles, predicted Tobin's Q during abrupt resources reallocation years surpasses that of incremental transitions (Figure 2).

Why does this occur? Intangible assets encode reusable, partly nonrival knowledge, including design rules, process blueprints, architectural know-how, and IP, that undergird dynamic capabilities of sensing, seizing, and reconfiguring (Teece et al., 1997; Eisenhardt and Martin, 2000; Winter, 2003). They also expand a firm's absorptive capacity to recognize, integrate, and apply knowledge in new domains (Cohen and Levinthal, 1990) and capture accumulated knowledge capital visible on the balance sheet (Griliches, 1990; Hall et al., 2005). Operationally, this stock of codified routines and shared language compresses both the depth and the duration of the abrupt transition. In other words, innovative activities can be recombined faster, interdependencies are re-specified with fewer coordination losses, and the new configuration reaches coherence sooner. Because Tobin's Q

reflects market expectations about future cash flows, investors anticipate a shorter and shallower adjustment period in intangible-rich firms, which raises predicted Q in discontinuous jumps years relative to incremental rebalancing.

Consistent with this mechanism, we do not observe comparable moderation for *Incremental Transition*. Incremental shifts preserve overlap between routines and impose limited reconfiguration costs that require buffering. In other words, when knowledge capital is thin, incremental transitions dominate; as intangibles deepen, discontinuous jumps become increasingly viable and can ultimately be superior, in line with H2.

To move beyond individual coefficients, we directly test whether the association between *Intangible Assets* and Tobin's Q differs across the two intertemporal transition modes. We examine whether the slope of the *Discontinuous Jump* in Figure 2 is distinct from the slope of the *Incremental Transition*. A Wald test rejects equality of slopes in the full sample ($F(1, 7088) = 8.19$, $p = 0.0042$). As intangibles increase, predicted Q during discontinuous-jump years rises while the incremental shifts effect on performance is flat to slightly declining, so the gap between the two modes widens with knowledge capital (see, Figure 2). This pattern matches H2's logic that predicts that intangibles reweigh the relative performance of intertemporal transition modes by cushioning the coordination and switching costs of radical reorientation.

4.3 When Do Intangibles Matter Most?

Columns 2 and 3 of Table 4 split the interaction model by resource regime to test H3's boundary conditions. Among *low-resource* firms, the negative main effect of a discontinuous jump is large in magnitude, and the *Discontinuous Jump* × *Intangible Assets* term is strongly positive. This means that knowledge capital plays the central buffering role proposed by theory in resource constrained environments. It shortens and attenuates the misfit phase, thereby enabling otherwise resource-constrained firms to implement a discontinuous jump without experiencing a persistent deterioration in performance. Among *high-resource* firms, neither the discontinuous jump main effect nor its interaction with intangibles differs significantly from zero. Put simply, when non–scale-free resources are already abundant, the baseline penalty from a discontinuous is neutralized by resource slack, and additional intangibles do not provide much incremental insurance.

Figures 2–4 present a graphical perspective of these dynamics. In the full sample and especially under low resources, predicted performance for a discontinuous jump rises sharply with intangibles and crosses the incremental-transition line at moderate levels of intangible assets. Under high resources, both slopes are comparatively similar across the distribution of intangibles, confirming that additional intangible resources do little when resource capacity is abundant.

Repeating the slope-difference test within each resource regime makes the boundary condition explicit. Under *low resources*, equality of slopes is strongly rejected ($F(1, 2416) = 12.72$, $p = 0.000$; Figure 3). Higher intangibles steepen the positive association between *Discontinuous Jump* and Tobin's Q, while the *Incremental Transition* slope remains slightly negative; discontinuous jumps overtake incremental transitions at moderate intangible levels, supporting H3a. By constrast, under *high resources*, we cannot reject that the two slopes are the same ($F(1, 4316) = 0.03$, $p = 0.8641$; Figure 4). This aligns with H3b prediction suggesting that when non–scale-free resources are abundant, slack already buffers reconfiguration costs, so additional intangibles add little incremental protection and the relative performance of discontinuous jump versus incremental transition is statistically indistinguishable across the observed range of intangibles.

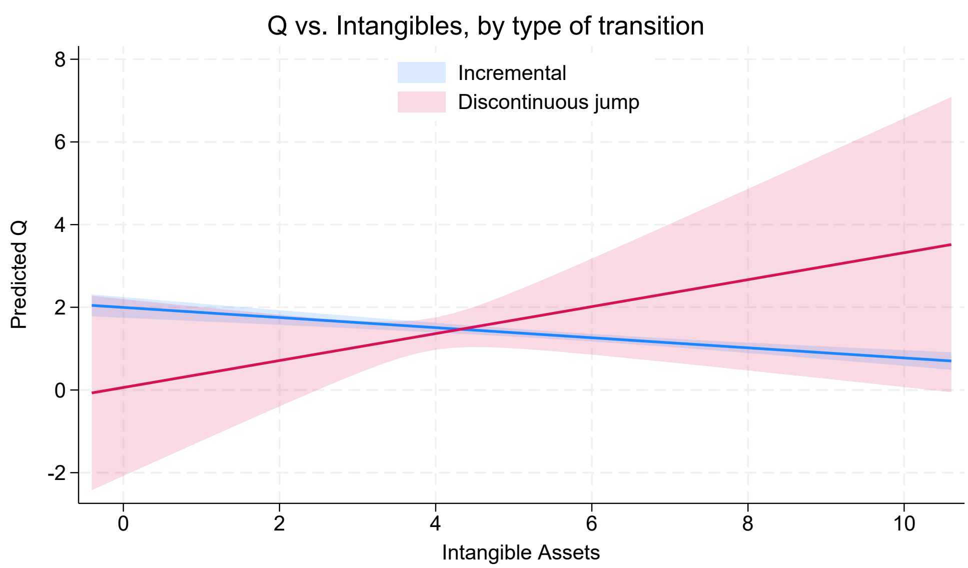


Figure 2: Predicted Tobin's Q vs. *Intangible Assets* (Full Sample). Lines show *Incremental Transition* and *Discontinuous Jump*.

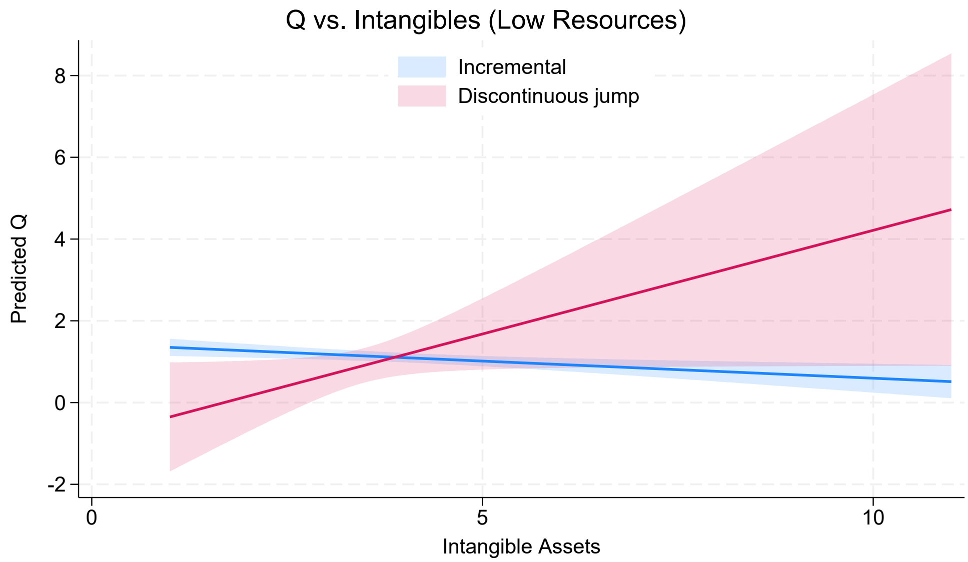


Figure 3: Predicted Tobin's Q vs. *Intangible Assets* (Low Resources).

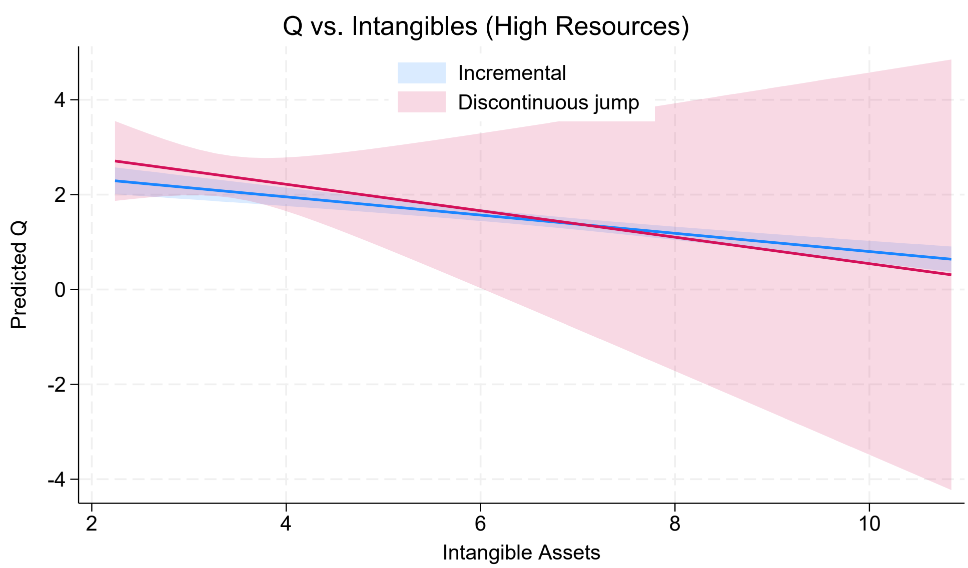


Figure 4: Predicted Tobin's Q vs. *Intangible Assets* (High Resources).

4.4 Implications for Theory and Practice

Bringing the evidence back to our theoretical framework, three implications stand out. First, the shape of the relationship between exploration–exploitation orientation and performance is not a universal outcome of ambidexterity; it is a function of the firm's non–scale-free resource endowment. This evidence helps to reconcile mixed results in the literature and implies that whether "ambidexterity" or "focus" prevails depends on resource contingencies. Second, the intertemporal transition mode matters asymmetrically. Discontinuous jumps are not inherently detrimental to performance (as initially predicted by Kang and Kim 2020); they are risky when reconfiguration costs cannot be absorbed, but enhance performance under high levels of intangible resources. Third, intangibles are the enabling mechanism for discontinuous jumps, especially in low-resource environments. Intangibles not only correlate with performance; they mitigate the coordination and adjustment costs associated with decomposing and reassembling tightly coupled innovation activities and organizational architectures during discontinuous jumps.

In sum, a coherent mechanism emerges from our results. Performance from ambidexterity is shaped by: (i) which resources bind (non–scale-free vs. scale-free), (ii) how firms move between logics (incremental vs. discontinuous), and (iii) how much slack cushions the opportunity costs of reallocation. Under scarcity, balance (ambidexterity) and incremental transition dominate because rivalrous inputs make extremes costly (Levinthal and Wu, 2010; Kang and Kim, 2020). As intangibles accumulate, discontinuous jumps can outperform by leveraging scalable assets to traverse conflicting logics at lower effective cost. Under resource slack, accumulating intangibles without governance invites overinvestment and variance, eroding returns (Ahuja and Novelli, 2017; Brielmaier and Friesl, 2023). Taken together, these results extend the ambidexterity literature by showing that the comparative advantage of balance vs. focus and incremental transition vs. discontinuous jumps is state-dependent. It turns on the interplay of resource slack, the type of resources deployed, and the firm's reallocation capability. In doing so, they reconcile seemingly divergent findings in prior research.

For managers, the implications are threefold. First, under resource scarcity, strive to balance exploitation and exploration (ambidexterity) unless the firm's knowledge base is deep enough to cushion a discontinuous jump. Second, under resource slack, mid-range postures are dominated by more focused strategies. And finally, if a strategic pivot is necessary in a resource-constrained context, *build or borrow* intangibles first—through R&D, alliances, or acquisitions—so that the misfit period is short and the new configuration locks in quickly.

5 Conclusion

This paper set out to clarify when firms should balance exploration and exploitation, when they may benefit from a more focused orientation, and how the mode of shifting between these orientations shapes performance. Motivated by persistent inconsistencies in ambidexterity research, we advanced a resource-contingent perspective grounded in the distinction between non–scale-free resources, rivalrous inputs that bind firms to trade-offs, and scale-free resources, particularly intangible assets, that can be redeployed at low marginal cost. Building on this foundation and a four-decade panel of U.S. public firms, we show that the performance consequences of both strategic orientation and temporal transition depend systematically on firms' resource endowments.

Our first contribution is to demonstrate that the performance effects of the trade-off between exploration and exploitation are contingent rather than universal. Under resource scarcity, firms face binding opportunity costs (Levinthal and Wu, 2010; March, 1991), and performance follows an inverted U-shape, with moderate ambidexterity yielding the highest returns. Under resource slack, by contrast, the dominant constraint shifts from resource rivalry to coordination and dilution, producing a U-shape in which more focused strategies outperform balance. These results help to reconcile mixed evidence by situating ambidexterity within a resource-based logic of when balance mitigates risk and when specialization yields superior returns.

Our second contribution is to extend ambidexterity research into the temporal domain. We show that discontinuous jumps, large reorientations between exploration and exploitation, are not universally detrimental. Their performance impact depends on the depth of the firm's scale-free, knowledge-based assets. Intangible assets embody routines, shared language, and reconfiguration capacity (Eisenhardt and Martin, 2000; Teece et al., 1997), and thus attenuate the coordination and switching costs typically associated with abrupt strategic change. When intangibles are limited, discontinuous jumps underperform incremental transitions; as intangibles accumulate, this gap narrows and can reverse. Moreover, the moderating effect of intangibles is strongest when non–scale-free resources are scarce and attenuated under slack, where tangible buffers already absorb adjustment frictions. These findings identify intangible assets as the microfoundation enabling firms to recombine and redirect activities without prolonged performance troughs.

Together, these results advance a more integrated and context-sensitive view of dynamic ambidexterity. They show that the value of balance versus focus, and of incremental versus discontinuous adjustment, is shaped by the interplay of resource rivalry, slack, and the redeployability of knowledge-based assets. Ambidexterity pays under scarcity; focus pays under slack; and radical change pays only when supported by scalable capabilities. This contingent logic helps unify insights from organizational learning, the resource-based view, and dynamic capabilities into a single explanatory framework.

This study has limitations that invite further research. Our empirical design provide strong correlational evidence rather than fully exogenous causal effects; and our sample of U.S. public firms reflects a particular institutional context. Future work could leverage exogenous shocks to resource availability, incorporate richer measures of organizational knowledge and attention, or test these mechanisms in other countries and competitive environments.

In sum, our results show that the performance of ambidexterity is state-dependent. By specifying the resource conditions under which balance, focus, incremental transitions, and discontinuous jumps create value, this study offers a new theoretical framework and provides managers with a clearer roadmap for aligning strategic choices and change processes with their organizations' underlying resource architectures.

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Table 1: Descriptive statistics (ordered by variable introduction)

	N	Mean	SD	Min	Max
Tobin's Q	15,074	1.508	1.341	0.000	9.976
f_ratio	15,074	-0.702	0.532	-1.000	1.000
f_ratio^2	15,074	0.775	0.319	0.000	1.000
Incremental Transition	15,074	0.078	0.268	0.000	1.000
Discontinuous Transition	15,074	0.004	0.066	0.000	1.000
Intangible Assetss	12,913	5.179	2.456	-4.962	11.661
Strategic Orientation	14,706	-0.061	0.222	-1.000	1.000
Industry Tobin's Q	15,074	1.582	1.103	-0.024	32.750
Market Share	15,074	0.154	0.242	0.000	1.000
Free Cash Flow Margin	11,175	-2.702	0.986	-9.891	1.016
Herfindahl-Hirschman Index	15,074	0.460	0.286	0.123	1.000
Total Patents	15,074	60.740	211.485	1.000	4,842.000
R&D Intensity	14,331	0.442	3.534	0.001	65.179
Firm Resources	14,218	595.276	2,477.042	0.205	95,501.227
Firm Growth Rate	15,074	0.080	0.208	-0.787	0.997
Past Transition Experience	15,074	1.357	0.919	0.000	5.000
Sales Growth	15,019	0.085	0.226	-0.550	0.936
Current Ratio	15,074	3.080	2.243	0.748	13.482
R&D Stock	14,790	5.890	1.981	-2.703	10.977
Leverage	15,074	0.402	0.206	0.059	1.110
Observations	15,074				

Table 2: Correlations Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1. Tobin's Q	1.000																			
2. f_ratio	-0.094	1.000																		
3. f_ratio^2	0.088	-0.471	1.000																	
4. Incremental Transition	-0.019	-0.027	-0.083	1.000																
5. Discontinuous Transition	-0.019	0.075	0.032	-0.014	1.000															
6. Logintangible Assets	-0.006	-0.157	0.055	0.186	-0.039	1.000														
7. Strategic Orientation	0.000	-0.171	0.012	0.043	-0.057	0.101	1.000													
8. Industry Tobin's Q	0.391	-0.080	0.100	-0.026	-0.013	0.044	0.009	1.000												
9. Market Share	-0.096	-0.049	-0.017	0.136	-0.027	0.357	0.066	-0.154	1.000											
10. Free Cash Flow Margin	0.357	-0.129	0.139	0.003	-0.023	0.162	0.047	0.212	-0.045	1.000										
11. Herfindahl-Hirschman Index	-0.123	0.111	-0.100	0.039	-0.003	0.067	-0.018	-0.213	0.550	-0.129	1.000									
12. Total Patents	0.024	-0.147	0.169	0.117	-0.013	0.331	0.053	0.034	0.142	0.115	-0.011	1.000								
13. R&D Intensity	0.229	-0.155	0.179	-0.071	-0.006	-0.131	0.009	0.208	-0.255	0.228	-0.282	0.090	1.000							
14. Firm Resources	0.071	-0.122	0.134	0.085	-0.012	0.394	0.052	0.082	0.171	0.192	0.015	0.586	0.083	1.000						
15. Firm Growth Rate	0.237	0.029	-0.010	-0.023	-0.010	-0.029	-0.022	0.126	-0.076	0.083	-0.046	-0.029	0.103	0.000	1.000					
16. Past Transition Experience	0.024	-0.125	-0.023	0.038	-0.049	0.142	0.131	-0.004	0.113	0.031	0.026	0.030	-0.019	0.047	-0.022	1.000				
17. Sales Growth	0.247	0.024	-0.003	-0.020	-0.003	-0.048	-0.032	0.126	-0.080	0.046	-0.063	-0.034	0.138	0.004	0.486	-0.032	1.000			
18. Current Ratio	0.159	-0.002	0.068	-0.108	0.020	-0.422	-0.052	0.114	-0.311	0.203	-0.210	-0.098	0.361	-0.129	0.092	-0.061	0.060	1.000		
19. R&D Stock	0.112	-0.328	0.224	0.194	-0.036	0.627	0.216	0.116	0.259	0.235	-0.067	0.483	0.224	0.479	-0.071	0.187	-0.092	-0.208	1.000	
20. Leverage	-0.121	0.013	-0.058	0.066	-0.024	0.345	0.012	-0.083	0.283	-0.179	0.169	0.038	-0.261	0.058	-0.067	0.030	-0.082	-0.571	0.140	1.000
Observations	15,074																			

Table 3: Fixed Effects Regression Results

	(1) Full sample	(2) Low resource	(3) High resource
f_ratio	-0.012	-0.024	0.044
	(0.021)	(0.019)	(0.056)
f_ratio^2	-0.005	-0.069	0.127
	(0.032)	(0.036)	(0.062)
Intangible Assets	-0.116	-0.080	-0.188
	(0.019)	(0.023)	(0.030)
Strategic Orientation	-0.032	-0.029	0.029
	(0.052)	(0.056)	(0.110)
Industry Tobin's Q	0.235	0.180	0.222
	(0.031)	(0.041)	(0.045)
Market Share	0.438	0.467	0.379
	(0.175)	(0.216)	(0.232)
Free Cash Flow Margin	0.107	0.036	0.135
	(0.012)	(0.021)	(0.026)
Herfindahl-Hirschman Index	0.161	0.113	0.187
	(0.161)	(0.142)	(0.221)
Total Patents	-0.000	0.000	-0.000
	(0.000)	(0.002)	(0.000)
R&D Intensity	0.167	0.407	-1.060
	(0.592)	(0.767)	(0.637)
Firm Resources	-0.000	0.002	-0.000
	(0.000)	(0.001)	(0.000)
Firm Growth Rate	0.370	0.616	0.172
	(0.067)	(0.104)	(0.097)
Past Transition Experience	0.005	0.032	-0.005
	(0.018)	(0.028)	(0.023)
Sales Growth	0.807	0.630	0.915
	(0.077)	(0.110)	(0.115)
Current Ratio	-0.003	0.006	-0.023
	(0.015)	(0.023)	(0.025)
R&D Stock	-0.138	-0.195	-0.219
	(0.052)	(0.068)	(0.090)
Leverage	-0.414	-0.649	-0.335
	(0.165)	(0.172)	(0.255)
Constant	1.904	1.489	2.726
	(0.345)	(0.334)	(0.557)
Observations	9443	3584	5370

Standard errors in parentheses

Table 4: Fixed Effects Regression Results: Incremental vs Discontinuous (moderated by Intangible Assets)

	(1) (1) Full sample	(2) (2) Low resource	(3) (3) High resource
Intangible Assets	-0.111 (0.020)	-0.081 (0.027)	-0.176 (0.031)
Incremental Transition	0.094 (0.100)	-0.019 (0.167)	0.176 (0.145)
Incremental Transition × Intangible Assets	-0.011 (0.013)	-0.003 (0.031)	-0.016 (0.018)
Discontinuous Transition	-1.843 (1.299)	-2.312 (1.264)	0.788 (1.314)
Discontinuous Transition × Intangible Assets	0.437 (0.324)	0.588 (0.351)	-0.103 (0.373)
Strategic Orientation	-0.080 (0.058)	-0.081 (0.063)	-0.050 (0.117)
Industry Tobin's Q	0.224 (0.032)	0.180 (0.045)	0.204 (0.044)
Market Share	0.473 (0.172)	0.496 (0.239)	0.461 (0.221)
Free Cash Flow Margin	0.098 (0.013)	0.025 (0.022)	0.131 (0.028)
Herfindahl-Hirschman Index	0.202 (0.177)	0.134 (0.153)	0.195 (0.228)
Total Patents	-0.000 (0.000)	0.001 (0.002)	-0.000 (0.000)
R&D Intensity	-0.822 (0.539)	0.700 (0.765)	-1.273 (0.785)
Firm Resources	-0.000 (0.000)	0.003 (0.001)	-0.000 (0.000)
Firm Growth Rate	0.282 (0.072)	0.553 (0.118)	0.048 (0.101)
Past Transition Experience	0.008 (0.020)	0.038 (0.033)	-0.008 (0.025)
Sales Growth	0.854 (0.085)	0.661 (0.120)	1.059 (0.137)
Current Ratio	0.004 (0.016)	0.026 (0.024)	-0.022 (0.025)
R&D Stock	-0.118 (0.059)	-0.178 (0.070)	-0.193 (0.103)
Leverage	-0.395 (0.182)	-0.530 (0.198)	-0.359 (0.273)
Constant	1.760 (0.356)	1.183 (0.345)	2.486 (0.606)
Observations	8496	3017	5024

Standard errors in parentheses