THE ADJUSTMENT–STABILITY TRADE-OFF IN RESOURCE ALLOCATION: IMPLICATIONS FOR PRODUCTIVE INVESTMENT

BY

NIKLAS LINDLBAUER

Assistant Professor in Strategic Management
King's Business School
King's College London
30 Aldwych London WC2B 4BG
London UK
Email: niklas.lindlbauer@kcl.ac.uk

YASEMIN Y. KOR

Beckwith Professor of Management Studies
Cambridge Judge Business School
University of Cambridge
Trumpington Street CB2 1AG
Cambridge UK
Email: y.kor@jbs.cam.ac.uk

AND

KULWANT SINGH

Professor of Strategy and Policy
NUS Business School
National University of Singapore
Kent Ridge
Singapore, 117592
Email: kulwant@nus.edu.sg

Under review at Journal of Management Studies

Keywords: Capital allocation; corporate headquarters; corporate investment; environmental change; firm performance; productive investment; resource allocation

Acknowledgements:

We thank Fransisco Brahm, Catherine Maritan, Will Mitchell, Sucheta Nadkarni, Elena Novelli, Timo Sohl, and the participants of the SMS Paris 2018, AOM Boston 2019 and SMS 2019 Minneapolis conferences for their feedback on an early version of this paper. The remaining errors are ours. We thank the Economic and Social Research Council (ESRC) for financial support.

The authors declare that there is no conflict of interest.

Abstract:

Productivity depends on how financial resources are deployed, combined, and aligned in diversified firms. In this paper, we address the structural trade-off between adjustment and stability in investment allocation by developing understanding of the performance effects of the extent to which firms adjust their financial resource allocation over time. Our results show that the relationship between a firm's extent of adjustment and performance is inverse U-shaped, indicating that neither adjustment nor stability in investment allocation is generally preferable, but rather that firms with the ability to balance the two deliver superior performance. We find that 96% of observations are located to the left of the turning point. This asymmetry indicates that firms more commonly under-adjust than over-adjust their productive investment allocation. In addition, we find that the turning point of the inverse U-shaped curve shifts right in fast-paced environments, and the relationship becomes steeper in highly competitive environments. With these findings, we help explain why decades of work on productive allocation efficiency has produced mixed results on the investment allocation-performance relationship: most studies did not distinguish the performance drag of under-adjustment from that of over-adjustment, effectively averaging two distinct tendencies.

THE ADJUSTMENT–STABILITY TRADE-OFF IN INVESTMENT ALLOCATION

INTRODUCTION

Productivity depends on how financial resources are deployed, combined, and aligned in diversified firms (Liebeskind, 2000; Mann, 2024, 2026). Hence, the allocation of financial resources among strategic business units (SBUs) is a critical strategic activity for diversified firms (Lieberman et al., 2017; Alayande and Coyle, 2023; O'Mahony and van Ark, 2026). Appropriately, this issue has a long history in finance, strategic management, and economics (Golubova and Roper, 2026; Rumelt et al., 1994). Past research has provided important insights on how efficiently diversified firms allocate resources in their internal capital markets (Mann, 2026; O'Mahony and van Ark, 2026; Levinthal, 2017). In particular, studies have examined whether HQs allocate capital to the most promising business units (Arrfelt et al., 2015; Bardolet et al., 2017; Feldman, 2016; Khanna and Tice, 2001; Stein, 1997). However, studies on on productive investment report "little consistent substantive relation between capital allocation […] and firm performance" (Busenbark et al., 2017, p. 2430) and the literature "has diverged in a number of directions that reflect different and often incompatible perspectives, underlying frameworks, and outcomes." This incompatibility is problematic, but not entirely surprising because studies paid limited attention to heterogeneity in the extent to which diversified firms adjusted financial resource allocations to their units (Alayande and Coyle, 2023; Almeida Costa and Gimeno, 2025). In this paper, we argue that accounting for heterogeneity in how substantially firms adjust resource allocation and the impact of such adjustments will improve understanding of the investment allocation-firm performance relationship and help resolve inconsistencies in the financial resource allocation literature.

Prior studies indicate that there is a structural trade-off between adjustment and stability in investment allocation. Resource allocation adjustments allow firms to adapt to changes in the external environment (Alayande and Coyle, 2023; Roper and Velu, 2026) and enable renewal. Increasing adjustments between the previous and the current investment allocation can help improve the fit between the firm's resources and the current opportunity set in the external environment (Levinthal, 2017;

Levinthal and Wu, 2025). However, adjustments in investment allocation are not frictionless. Resource-based research shows the importance of stability in resource allocation, because resource and capability development are cumulative, path-dependent, and require time for adaptation (Dierickx and Cool, 1989; Penrose, 1959). In addition, budgets must be absorbed and turned into projects, routines, teams, and capabilities, which can result in coordination challenges and costly frictions (Helfat and Maritan, 2023; Maritan and Lee, 2017a). Firms that adjust their financial resource allocation face heightened administrative and organizational challenges. Implementing increased or decreased allocations from the HQ to the units – or re-allocations among units – involves recruitment, dismissal, and re-training of managers and employees, along with development of new operational processes (Kor and Leblebici, 2005; Penrose, 1959).

Hence, while adjustments improve resource–opportunity alignment, stability preserves the continuity of ongoing processes without disruption. However, existing theories of investment allocation struggle to adjudicate when adjustment versus stability is performance-enhancing. It is also unclear how payoffs from these alternative approaches vary with the environment in which the firm operates. As resource allocation is closely linked to a firm's competitiveness (Levinthal and Wu, 2010; Lieberman et al., 2017), it is important to clarify our theoretical and empirical understanding of which of these two strategic approaches confers greater advantage to firms. With this focus, we ask: *How do greater adjustments versus stability in investment allocation impact firm performance? How do environmental characteristics influence the impact of adjustment versus stability in investment allocation on firm performance?* Answering these questions will improve understanding of the structural trade-off between adjustment and stability in investment allocation.

We test our predictions with a panel dataset of 354 diversified listed firms in the U.S. from 2001 to 2017 (2,814 firm-years). Results support our predictions and demonstrate an inverse U-shaped relationship between the extent to which firms adjust financial resource allocation and their performance. We also find that the vast majority of firms are situated to the left of the turning point of the inverse U-shaped curve. In addition, the turning point shifts right in fast-paced environments, and the relationship becomes steeper in highly competitive environments. These results suggest that firms can improve their performance through greater investment allocation adjustments when environments change quickly and by recognizing that penalties for miscalibration are more severe when competition is intense.

Our paper makes two contributions to the financial resource allocation literature (Feldman, 2016; Levinthal, 2017; Lieberman et al., 2017; Sengul et al., 2019). First, we contribute by helping to resolve the structural trade-off firms face between adjustment and stability in investment allocation. While the literature provides important insights about whether internal resource allocation is efficient, it has largely overlooked an important dimension of resource allocation: the extent to which firms adjust their resource allocation over time. We show that the relationship between resource allocation adjustments and performance is inverse U-shaped, where profitability increases with greater adjustments, but then declines at high levels of adjustments. This suggests that neither adjustment nor stability in investment allocation is generally preferable, but that firms able to balance the two deliver superior performance. We find that 96% of observations are located to the left of the turning point. This asymmetry indicates that firms more commonly under-adjust than over-adjust their investment allocation. We develop insights regarding whether adjustment or stability in financial resource allocation leads to superior performance. Hence, our paper helps to explain why decades of work on allocation efficiency has produced mixed results on the resource allocation-performance relationship: most studies did not distinguish the performance drag of under-adjustment from that of over-adjustment, effectively averaging two distinct tendencies.

Second, our paper contributes by further clarifying *when* greater adjustments to investment allocation are superior to stability. We show how the structural trade-off between adjustment and stability shifts with the environment in which firms operate. In particular, results show that the estimated turning point shifts right in fast-changing environments, which means that firms operating in these environments will benefit from greater adjustments in their resource allocation. Further, we show that firms in highly competitive environments that do not appropriately adjust their resource allocations miss significant gains. Thus, our study provides insights on how firms can make well-informed choices about the structural trade-off between adjustment and stability, contingent on the environment in which they operate.

Our paper aims to reorient the conversation in the financial resource allocation literature beyond its traditional static focus (Lieberman et al., 2017; Liebeskind, 2000), i.e., the question of whether internal resource allocation is efficient. Instead, our theory and results suggest that adopting a dynamic perspective of investment allocation unearths two overlooked allocation challenges: under- and over-adjustments. Our paper takes a first step to understanding how strongly firms adjust their resource allocation, by showing the performance implications of this choice. More broadly, this dynamic perspective adds to research on productive investment (Mann, 2024, 2026; O'Mahony and van Ark, 2026) by showing that the outcomes associated with capital expenditure depend not only on its level, but also on how strongly its internal allocation is revised over time.

THEORY AND HYPOTHESES

Adjustment Versus Stability in Investment Allocation

Noda and Bower's (1996) case study of telecom firms and subsequent work by Bower and Gilbert (2005) highlight the evolutionary and iterative nature of resource allocation. These studies suggest that firms regularly engage in a spectrum of continuous iterative adjustments in resource allocation. These adjustments take place when the HQ increases (or decreases) the resource allocations of several SBUs simultaneously if multiple markets become more (less) attractive, requiring greater (lower) investment overall, and when the HQ reallocates resources from one SBU to another (if one or some markets become more attractive and others less attractive). Alternatively, firms may opt for stability and choose not to adjust their investment allocation.

Resource Adjustment Economies

Adjustments to corporate-level investment allocation offer multiple benefits. *Resource adjustment economies* refer to improving the fit between the firm's resource allocation and the current opportunity set. Let A_{t-1} refer to the prior resource allocation, A_t to the new allocation, and O_t to the current opportunity set. Increasing the distance between A_t and A_{t-1} can help improve fit with O_t; this is what resource adjustment economies capture. The HQ may increase the allocation to multiple business units where the firm has the potential to take advantage of a positive outlook, which enables both resource picking and resource development activities (Makadok, 2001; Maritan, 2001; Sengul et al., 2019). Such allocation adjustments enable firms to pursue opportunities in new markets or product segments. Mitchell (1989, 1991) shows that entering an emerging subfield when it threatens the firm's core business can offset external threats and enhance adaptation. Resource allocation adjustments also offer a mechanism for re-allocating resources from less attractive to more attractive markets (Helfat et al., 2007). Thus, adjustments to resource allocation are a way for diversified firms to adapt and undertake new investments (Lovallo et al., 2020; Teece, 2007) as external market conditions change, consumer demand shifts, and new technologies emerge (Sengul et al., 2019).

While the HQ may increase the allocations of multiple (or even all) units at the same time, taking advantage of new external opportunities can also involve contractionary adjustments in resource allocation to some SBUs, to release capital for expansionary adjustments in other SBUs (Vidal and Mitchell, 2018). When resources are re-allocated within the firm, they can be used for the development and maintenance of capabilities in other existing and new business units (Helfat et al., 2007).[1] Thus, resource allocation adjustments can enable the firm to improve the fit with the current opportunity set.

Further, firms that do not adjust their investment allocation sufficiently over time may be deprived of important renewal initiatives and may miss the opportunity to develop new capabilities and competencies (Peteraf, 2005; Coen and Maritan, 2011). Failing to make adequate allocation adjustments may prevent SBUs from investing in new markets or product segments (in the case of positive adjustments) or prevent the firm from freeing up resources (in the case of negative adjustments). Insights from research on technological change suggest that some firms may not undertake these value-generating

[1] We highlight that different mechanisms may be at play simultaneously when firms adjust their resource allocation. It is frequently argued in the literature that resource allocation strategies should follow performance prospects of SBUs, sometimes called the 'winner picking' approach to resource allocation (Stein, 1997; Arrfelt et al., 2013, 2015). However, alternative mechanisms and motives exist, such as exploiting synergies across SBUs, which can be closely linked to the development of capabilities (Busenbark et al., 2017b).

adjustments. For instance, Eggers and Kaplan (2009), Kaplan (2008), Tripsas (2009), and Tripsas and Gavetti (2000) show how established organizational identity and inflexible managerial cognition can impede adaptation to technological change. Further, this literature has shown how structural reasons (such as adopting formal process management practices) can result in inertia (Benner, 2009; Benner and Tushman, 2002; Chaturvedi and Prescott, 2022).[2]

We note that investment allocation adjustments can be triggered by both unit-specific and corporate strategy reasons (Busenbark et al., 2017b, 2022). Firms may make resource allocation changes to meet the capital needs of specific SBUs arising from business opportunities (Sengul and Obloj, 2017), due to a change in the firm's strategy or to realize synergies among SBUs. These adjustments collectively help the firm to adapt to changing environmental conditions. As our theory deals with the issue of whether firm-level resource allocation is stable or whether it is adjusted significantly by the HQ, we focus on how its aggregate resource allocation adjustments shape firm-level performance. Focusing on resource allocation and performance at the *firm level* allows us to provide a theory and test the appropriateness of the extent of such adjustments as a means to improve the overall performance of the firm.

Resource Adjustment Diseconomies

In addition to value creation through resource adjustment economies, firms also face *resource adjustment diseconomies*. Using the notation above, while increasing the distance between A_t and A_{t-1} can help improve fit with O_t, it also raises the costs of moving away from prior investment allocations. Resource adjustment diseconomies capture the idea that adjustments in resource allocation are not frictionless: budgets must be absorbed and turned into projects, routines, teams, and capabilities. Insights from the resource-based view suggest that excessive adjustments can put administrative and organizational stress on the firm and disrupt the process of building capabilities and competencies. Capability development is cumulative and path-dependent (Penrose, 1959; Dierickx and Cool, 1989), requiring some level of stability in resource allocation over time (Mahoney and Pandian, 1992; Peteraf, 1993). Substantial

[2] While drawing insights from how firms allocate resources to deal with issues such as disruptive technology and complementary assets, we do not focus on how resources are used within product and technology levels (e.g., Bower and Gilbert, 2005; Collis, Young, and Goold, 2007).

adjustments in resource allocation to business units can disrupt the process of building competencies, alliances, and managerial and employee human capital development.

The stress on the firm's human resources, especially managerial resources, can be particularly high because of the need to train new employees, manage workforce reductions, and develop and implement new routines and processes following resource adjustment activities (Kor and Leblebici, 2005; Penrose, 1959). Substantial investment allocation adjustments can also impair the development of managerial and employee human capital (Adner and Helfat, 2003; Grant, 1996), leading to a loss of productivity and diminished product and service quality (Galli Geleilate et al., 2021; Penrose, 1959). Adjustments have ramifications for the firm's strategic alliances and supply chain partners, whose operations may be disrupted and fail to meet the firm's expectations. Ultimately, substantial resource allocation adjustments may harm a firm's capabilities or jeopardize its advantages in some markets (Lovallo et al., 2020).

Hence, investment allocation adjustments offer both benefits and costs. As Figure 1 shows, the initial set of resource allocation adjustments is likely to be more obvious in potential benefits (akin to low-hanging fruits) while additional adjustments may bear higher costs and outcome risks. For example, a clear declining trend in one business may justify reduced resource allocation to that unit; however, where the trajectory and pacing of the event are less certain, later resource allocation adjustments may entail greater risks and offer diminishing benefits. Yet, at higher levels of adjustments, resource allocation adjustment costs are likely to escalate because of disruption in the firm's routines and operations, cumulative capability development, and key alliances. Figure 1 shows both resource adjustment economies and diseconomies. When adjustment diseconomies surpass corresponding economies, further resource allocation adjustments result in negative effects on firm performance. Based on the combination of these effects, we predict:

> ***Hypothesis 1:*** There is an inverse U-shaped relationship between a multi-business firm's extent of adjustments in its financial resource allocation to SBUs and its firm-level performance.

Insert Figure 1 here

Adjustment Versus Stability in Fast-Paced Environments

Extant resource allocation research highlights that alignment with the external environment is important for efficient internal resource allocation (Capron and Mitchell, 1998; Levinthal and Wu, 2010; Feldman, 2019) because external conditions shape the demand and opportunity for capital investments (Arrfelt et al., 2015; Sengul and Gimeno, 2013). Integrating this argument into our theory, we submit that the benefits of adjustment versus stability will depend on the environment in which the firm operates. We go beyond studying *whether* substantial adjustments or stability in resource allocation promotes performance to theorize *when* resource allocation adjustments are superior to stability (and vice versa). We specifically focus on how environmental pace of change and industry competition shape the performance effects of investment allocation adjustments.[3, 4]

First, the payoffs a firm can expect from a certain level of adjustment in investment allocation depend on *the pace of change in the environment*. Environments with a high pace of change are characterized by rapid technological change and short product life cycles (Kor and Mahoney, 2005). In these environments, customer preferences tend to change rapidly (Tripsas, 2008). This rapid pace of change generates more value creation opportunities, compared with slower-paced environments, where stable conditions offer fewer opportunities (Barr et al., 1992; Müller and Kunisch, 2018). Firms can take advantage of these opportunities through adjustments in resource allocation to SBUs, to realign with the changing conditions in specific environments and to take advantage of the synergies among SBUs.

[3] Industry munificence (growth) may motivate the firm to increase its resource allocation to relevant SBUs. However, because H1 focuses on the association between absolute level of change in resource allocation (which includes both increases and reductions in resource allocation) and firm performance, it is not clear whether/how industry munificence would moderate the resource adjustment-performance relationship. Thus, we do not hypothesize industry munificence as a moderator but examine its impact empirically as a control.
[4] Sengul et al. (2019) also argued that industry growth cycles or shocks in specific industries can influence resource allocation. We focus on the moderating effects of the pace of environmental change and industry competitiveness (while controlling for industry growth) but agree that the impact of industry-specific shocks on resource allocation merits further examination.

It is critical for firms to achieve strategic fit between their capabilities and the external environment (Maritan and Lee, 2017a; Peteraf, 2005). Fast-paced environments are likely to require firms to undertake greater adjustments, for example, by rapidly developing, modifying, or replacing capabilities (Helfat et al., 2007; Taylor and Helfat, 2009). Increasing or reducing investments in certain SBUs due to changing customer preferences or entering (or leaving) a new market segment are important ways for diversified firms to maintain or improve their performance (Nauhaus et al., 2021). In a fast-paced environment, it may be necessary for a firm to undertake a greater extent of adjustments in resource allocation to SBUs to improve fit between resource allocation and the pace of environmental change (Sengul et al., 2019) and to improve the outcomes of adjustments. Thus, high levels of resource allocation adjustments in fast-changing environments with more opportunities may lead to improved performance. Accordingly, we hypothesize that the inverse U-shaped relationship between the extent of adjustment in resource allocation and firm performance will shift right in fast-paced environments.[5] This suggests that, to achieve peak performance, firms operating in high pace of change environments need to undertake greater levels of resource allocation adjustments than firms operating in low pace of change environments. Specifically, we hypothesize:

> ***Hypothesis 2:*** The inverse U-shaped relationship between a multi-business firm's extent of adjustments in its financial resource allocation to SBUs and firm-level performance shifts to the right for firms operating in fast-paced environments relative to firms operating in slow-paced environments.

Adjustment Versus Stability in Competitive Environments

The payoffs for firms undertaking adjustment in investment allocation also depend on the level of environmental competitiveness. When a firm engages in an action in a highly competitive environment, the reactions of rivals tend to be more aggressive than in a less competitive environment (Ferrier et al.,

[5] As Haans et al. (2016, p. 1184) state, depending on the specific theoretical rationale, a moderator can affect a quadratic relationship in two alternative ways: it can "shift the turning point of the curve left or right" or "flatten or steepen the curve". Drawing on our theory development, our prediction in H2 concerns the former – a right shift in the turning point (i.e., the peak occurs at a higher extent of adjustment value under high pace of environmental change).

1999; Young et al., 1996). Competitive reactions can involve matching the focal firm's business initiative (e.g., new market entry) or swiftly capitalizing on mistakes. These responses can allow rival firms to capture additional market share and protect or improve their position and performance (Ferrier, 2001; Miller and Chen, 1994).

These insights from the competitive dynamics literature have important implications for a multi-business firm's resource allocation adjustment and its effects on firm performance. In highly competitive environments, rivals are likely to be aggressive in capitalizing on the missed opportunities or mistakes made by the focal firm, such as failing to enter a new market segment or making pricing or product errors. In less competitive environments, the responses of rival firms are likely to be more muted, which may limit the performance loss a firm may experience. Thus, even though inertia is generally undesirable (Arrfelt et al., 2013; Bardolet et al., 2011; Lovallo et al., 2020), firms may choose relative stability in resource allocation in less competitive environments, as this will have less negative impact than in more competitive environments. Similarly, resource allocation over-adjustment can be particularly harmful in highly competitive environments where rival companies are likely to respond more aggressively to allocation mistakes.

Taken together, an inappropriate level of change in headquarters-level investment allocation (i.e., under- or over-adjustments) is likely to be challenged more strongly by rival firms in more competitive environments. In these environments, the resource adjustment cost curve in our model becomes steeper, increasing the steepness of the overall hypothesized inverse U curve. Firms that fail to sufficiently adjust their resource allocation will be punished more strongly in highly competitive environments than in less competitive ones. Accordingly, we predict:

> ***Hypothesis 3:*** The inverse U-shaped relationship between a multi-business firm's extent of adjustments in its financial resource allocation to SBUs and firm-level performance is steeper for firms operating in highly competitive environments than for firms operating in less competitive environments.

DATA AND METHODS

Data and Sample

Our study is based on U.S. firms listed in the Standard and Poor's (S&P) 1500 index in 2001. We collected data on these firms for 2001–2017. In 1998, the Securities and Exchange Commission (SEC) replaced Financial Accounting Standard (FAS) 14 with FAS 131, requiring companies to report financial data on the segment level in a more detailed manner, which enables us to examine firms' financial resource allocation changes at the SBU level. Allowing firms two years to adjust to the reporting rule change, we calculate allocation changes from 2001. We conclude the sample in 2017 to avoid the confounding effects of the new Accounting Standards Codification (ASC) 606, which became effective for public firms in 2018. ASC 606 fundamentally changed how and when companies recognize revenue and, by implication, affects multiple earnings- and net-income related variables at both firm and industry levels, making changes in key variables difficult to compare.

As our theory relates to diversified firms, we follow previous studies (Arrfelt et al., 2013, 2015; Duchin and Sosyura, 2013) in excluding single-business firms. Similarly, given that returns from the financial services and utilities industries (SIC codes 6000–6999 and SIC codes 4900–4999) are not comparable to other industries, we exclude these firms (McGahan and Porter, 1997; Misangyi et al., 2006). After accounting for missing data, our final dataset comprises 2,814 firm-year observations of 354 diversified firms. We collected firm-level and industry-level financial data from the *Compustat* database and board governance and managerial ownership data from the *MSCI GMI Ratings*.

Dependent Variable

Our dependent variable is firm performance, which we measure by change in return on assets (ROA), where ROA is calculated as net income divided by total assets. ROA is a key metric of the ability to generate profits given a company's stock of assets (Hill and Snell, 1988; Brealey and Myers, 2003). As the change in ROA in a single year can be noisy and transient, we calculate change in ROA over a two-year period (t+1 to t+3) and also allow for a one-year lag between performance change and the explanatory variables (t). As an example, this means we regress the explanatory variables measured in 2001 on the change that occurred in ROA during 2002–2004. In robustness checks, we test hypotheses with alternative performance indicators, including changes in return on equity (ROE) and market value.

Independent and Moderating Variables

Extent of adjustment in financial resource allocation to SBUs. Our key independent variable is a firm's extent of adjustment in financial resource allocation to SBUs. We use Compustat segment data based on companies' annual Form 10-K filings to develop this measure. Compustat data suffers from limitations concerning what constitutes an SBU; firms may assume and use different definitions (e.g., creating segments around SIC codes, geographical areas, or a mix of the two). Also, firms may change the definition of what constitutes an SBU over time, making different observations difficult to compare. To address this issue, strategy and corporate finance researchers aggregate reported segments by four-digit SIC codes to create SBUs that are consistent within each firm and comparable across firms (Bardolet et al., 2010, 2011; Lamont, 1997; Ozbas and Scharfstein, 2010). Following this procedure, in our sample, the number of SBUs in a firm is based on the number of four-digit SIC codes the company operates in each year.

To operationalize our key independent variable, we extend the standard approach used in strategy and finance literatures to capture corporate-level resource allocation in diversified firms (Arrfelt et al., 2013, 2015; Bardolet et al., 2011; Glaser et al., 2013; Khanna and Tice, 2001; Rajan et al., 2000). This approach accounts for the capital investments a multi-business firm makes in its SBUs, as indicated by the total capital expenditure budget allocated to individual SBUs each year. Starting with these numbers, we follow a three-step procedure to calculate a firm's extent of adjustment in resource allocation to SBUs.

First, we compute SBU-level capital expenditure ratios by dividing the total capital expenditure budget allocated to each SBU by its total assets (Duchin and Sosyura, 2013; Rajan et al., 2000; Xuan, 2009). Second, we calculate the annual percentage point change in the capital expenditure ratio for each SBU. For example, if an SBU had a capital expenditure ratio of 10 percent in one year and of 12.5 percent in the next, the difference is 2.5 percentage points. We take the absolute value of the change as our theoretical predictions are focused on the magnitude of change (versus the direction of the change). Third, to compute the firm's overall extent of adjustment in its resource allocation to SBUs, we take the weighted average of annual changes in the capital expenditure ratios of all SBUs. Because SBUs differ in importance, we multiply the absolute difference by the SBU's importance weight. We use the percentage of the firm's total assets represented by each SBU as its weight. This ensures that an adjustment in resource allocation to a very small SBU is not given the same importance as the adjustment in the allocation to a large unit. To obtain the overall firm-level extent of adjustment in resource allocation to SBUs, we sum the weighted individual change figures (the absolute values of change) for all SBUs of the firm. The formula for this variable is:

$$\textit{Extent of adjustment in financial resource allocation to SBUs} = \sum_{i=1}^{N} \left|\left(CapEx_{i,t0} - CapEx_{i,t-1}\right)\right| * W_i ,$$

where N is the number of strategic business units, $CapEx_{i,t0}$ refers to the capital expenditure ratio of the i^{th} SBU in year t_0, and W_i is the weight of the i^{th} SBU based on its percentage of total firm assets.

Pace of environmental change. The pace of environmental change reflects the volatility and unpredictability of change in a firm's external environment (Goll and Rasheed, 1997; Herrmann and Nadkarni, 2014; Keats and Hitt, 1988). We operationalize this variable by examining the volatility of industry sales over five years. Following Misangyi *et al.* (2006), we calculate the pace of environmental change for each four-digit SIC code (using all firms available in Compustat) by first regressing total industry sales over five years, containing the focal year as a midpoint, on the year variable. For example, pace of environmental change for the year 2001 is based on a regression for the years 1999-2003. Then, the standard error of the regression slope coefficient is divided by the mean of total industry sales for those years (Boyd, 1990; Dess and Beard, 1984). Given the multi-business nature of the firms in our sample, we calculate a weighted average of the pace of environmental change for each industry in which a firm operated, and use the relative SBU size as the weight (i.e., percentage of total firm assets represented by the SBU).

Industry competitiveness. Following previous studies, we use the Herfindahl index to calculate the level of industry competitiveness (Boyd, 1990, 1995; Herfindahl, 1950). The Herfindahl index is computed as the sum of the squared market shares of all companies operating in a particular four-digit SIC industry (using all firms available in Compustat). This index accounts for the number of firms in the industry and their relative market power, which diminish the opportunities for coordination and thereby increase competitive activity in the industry (Boyd, 1990, 1995; Oster, 1999). As with other industry indicators, we use a weighted average approach to calculate the overall industry competitiveness, using SBU size as a weight (percentage of total firm assets represented by the SBU). The resulting index is multiplied by (-1) to help with interpretation, such that higher values of the index serve as a proxy for higher levels of competitive activity. The formula for this variable is:

Industry competitiveness = $\sum_{i=1}^{N}(\sum_{j}^{M} s_j^2 \; * \; W_i)$,

where N refers to the number of SBUs, s_j is the market share of firm j and M is the number of firms in a particular industry. W_i refers to the weight of the i^{th} SBU based on its percentage of total firm assets.

Control Variables

We use several control variables in our regression analyses. Firm-level control variables capture the availability of resources in each firm and the strategic orientation of the firm with respect to diversification and technology development. *Firm size* is an indicator of the overall availability of resources in the firm (Gupta et al., 2018), which may impact a firm's resource allocation adjustments. *Financial leverage*, measured as the debt to asset ratio, controls for the firm's debt capacity, which influences the availability of funds for further initiatives. Further, we control for the *capital intensity ratio* for each firm, calculated as the value of capital expenditures divided by total assets, reflecting a firm's corporate investment orientation (Feldman, 2021). We control for the availability of short-term financial resources with the *current ratio*, which may facilitate change in resource allocation (Arrfelt et al., 2013). Current ratio is calculated as current assets divided by current liabilities (Carnes et al., 2019; Cheng and

Kesner, 1997). The extent of diversification may affect the efficiency of resource allocation processes at the corporate level (Bower and Gilbert, 2005). We control for *diversification*, using the entropy measure of total diversification (Palepu, 1985; Arrfelt et al., 2013), calculated as:

Total entropy = $\sum_{i=1}^{N} P_i \ln(1/P_i)$,

where P_i is the percentage of firm sales in four-digit SIC code i for a firm with N different four-digit SIC strategic business units.

R&D intensity indicates a firm's investments in technology development, which is operationalized as R&D expenses divided by total revenues (Carpenter and Fredrickson, 2001). To account for the potential influence of a firm's recent profitability on resource allocation, we control for *ROA in year t-1*. *Industry munificence* controls for growth in the external environment (Dess and Beard, 1984). We calculate industry munificence by first regressing the total industry sales over five years, containing the focal year as a midpoint, on the year variable (Misangyi et al., 2006). We then divide the slope coefficient of the regression by the mean of total industry sales for those years (Dess and Beard, 1984). Finally, we compute an asset-weighted average of the munificence values for different areas of the firm's business.

The corporate governance and agency theory literatures highlight the importance of the board of directors, as well as of directors' and executives' ownership in corporate investment and allocation decisions (Filatotchev and Boyd, 2009). We control for *board size,* the *percentage of inside directors*, and *CEO duality* (Westphal and Zajac, 1995; Withers and Fitza, 2017). *Board size* influences the rigor of board debates. Strong representation of inside directors may reduce board monitoring effectiveness (Boivie et al., 2016). *CEO duality* may diminish the effectiveness of board monitoring. This variable is measured with a dummy variable that takes the value of 1 if the CEO is also the chair of the board. To account for incentive alignment for the top management team and directors, we control for *ownership by executives and directors*, calculated as the percentage of outstanding common stock owned by them

(Boyd and Solarino, 2016; Gupta et al., 2018; Xuan, 2009). Finally, *CEO change* takes the value of 1 in the year a new CEO is appointed as this may lead to changes in strategy (Beatty and Zajac, 1987).

RESULTS

We test our hypotheses with a panel dataset, based on repeated observations on the same set of cross-sectional units. A robust Hausman test rejects the null hypothesis of no systematic difference between random effects and fixed effects models. Thus, we estimate fixed effects panel regressions, including firm-clustered standard errors (Wooldridge, 2010). With this methodology, we control for industry effects (primary industry SIC) and other time-invariant factors.

Descriptive statistics and correlations are provided in Table I. Results of regression analyses are reported in Table II. Model 1 is the base model comprising control variables. In Hypothesis 1, we predict an inverse U-shaped relationship between the extent of adjustments in resource allocation to SBUs and firm-level performance. As shown in Model 2 of Table II, the coefficient of the extent of overall adjustments in resource allocation (main term) is positive (β = 0.721; *p-value* = 0.005), and the coefficient of the squared term is negative (β = -5.126; *p-value* = 0.005), supporting an inverse U-shaped relationship. We plotted the results in Figure 2(a). Interestingly, results show that approximately 96% of firm observations are to the left of the turning point, and only 4% are located to the right. We performed the three-step test developed by Lind and Mehlum (2010), which provides a more robust way of establishing an inverse U-shaped relationship (Haans et al., 2016). Specifically, this test simultaneously considers (1) whether the coefficients are significant and have the expected signs; (2) whether the slope of the inverse U-shape is sufficiently steep at both ends of the sample range; and (3) whether the maximum point of the curve is placed well within the sample range. Results of the Lind and Mehlum test (p = 0.004) confirm that the three conditions are satisfied and support the inverse U-shaped relationship between the extent of adjustment of resource allocation to SBUs and firm performance predicted in Hypothesis 1. We performed this test for Models 2 to 5, and results are reported in the final row of Table II.

Insert Table I, Table II and Figure 2 here

Our results indicate substantial effects of how a firm balances the competing strategic approaches of adjustment vs. stability. Specifically, when a firm's extent of adjustment in resource allocation is one standard deviation below the turning point, the firm is associated with a loss of 0.30 percentage points in change in ROA (a reduction from 2.02% to 1.72%). Given that the average ROA in our sample is 5.2%, a loss of 0.30 percentage points in ROA equals a 5.8% loss of a firm's profitability. For the average firm in our sample, this corresponds to a loss of US$51.1 million in profits. Given the curvilinear nature of the resource adjustment-performance relationship, this effect substantially increases for firms further from the turning point; at two standard deviations below the turning point, the loss increases to 23.1% of a firm's profitability, which corresponds to a loss of US$204.5 million. These are economically significant amounts.

Hypothesis 2 predicts that the relationship between the extent of adjustment of resource allocation to SBUs and firm performance is moderated by the pace of environmental change. Specifically, for firms operating in fast-paced industries, the turning point of the inverse U-shaped relationship between the extent of adjustment and firm performance shifts right. Model 3 of Table II supports this moderation hypothesis (β = -2.017; *p-value* of the *pace of environmental change x extent of adjustments* = 0.013, and β = 19.175; *p-value* of the squared term = 0.012). We plotted the hypothesized change in the inverse U-shaped relationship in Figure 2(b). In this figure, the dotted line refers to firms in fast-changing industries (i.e., at the 75th percentile), and the solid line to firms in slower-changing industries (i.e., at the 25th percentile). Markers in Figure 2(b) denote the estimated turning points. Model 3 shows that the turning point in low pace of change industries is located at an extent of adjustment value of 0.067, whereas in high pace of change industries it is at 0.073 – a shift to the right of 0.006; this indicates that about 9% greater adjustment is required to reach the turning point in high pace of change industries. Consistent with our theoretical reasoning, these results indicate that there are greater returns to high levels of resource adjustments in fast-changing than in slow-changing industries. At lower levels of resource adjustments, performance effects are not systematically different under low and high pace of industry change. This could be due to greater predictability and similarity of lower-level (less risky) adjustments across slower- and faster-paced industries. However, beyond these low-risk adjustments, firms need to undertake a higher extent of resource allocation adjustments in fast-paced industries to achieve higher levels of performance. These results support H2.

In Hypothesis 3, we posited that for firms operating in highly competitive industries, the inverse U-shaped relationship between the extent of adjustment in resource allocation and firm performance becomes steeper. Model 4 in Table II supports this hypothesis. To test the "steepening" of the inverse U-shaped effect, we follow the procedure recommended by Haans *et al.* (2016). Specifically, they recommend that in testing moderation relationships associated with a nonlinear variable, "a steepening occurs for inverted U-shaped relationships when β_4 [i.e., the coefficient of the interaction term between the moderator variable and the squared independent variable of interest] is negative" (Haans et al., 2016, p. 1187). Model 4 of Table II shows that this is indeed the case for the *extent of adjustments in resource allocation*^{2} *x industry competitiveness*, which has a value of -21.015. In addition, Model 4 of Table II provides support for the hypothesized moderation effect (β = 2.937; *p-value* of *extent of adjustment x industry competitiveness* = 0.006, and β = -21.015; *p-value* of the squared term = 0.013).[6] We plotted the hypothesized change in the inverse U-shaped relationship in Figure 2(c). In this figure, the dotted line refers to firms operating in industries with high levels of competition (i.e., at the 75th percentile), and the solid line refers to firms operating in industries with low levels of competition (i.e., at the 25th percentile). This graph shows that, for firms in highly competitive industries, the inverse-U curve is steeper.

The results suggest that firms operating in more competitive industries are punished more severely for failing to reach the highest point of the inverse U curve. For example, at one standard deviation below the turning point of the curve, firms in *less* competitive industries incur a profitability loss from under-adjustment of 0.16 percentage points. Yet, in *more* competitive industries, the percentage

[6] We also conducted a power test; for an alpha of 0.05, this test showed that our regression analysis achieved a power of 0.95, i.e., above the commonly accepted threshold of 0.80 (Cohen, 1988).

point loss from being one standard deviation below the turning point equals 0.46 percentage points. Thus, in highly competitive industries, the punishment effect of failing to reach the turning point appears to be almost three times as great as in less competitive industries (0.46 versus 0.16 percentage points). This amounts to an extra 0.30 percentage point loss from failing to reach the turning point of the curve, which corresponds to a lost opportunity of US$51.2 million in profits.

Robustness Checks

We conducted a series of robustness tests. First, we examined whether results hold for alternative indicators of firm performance by considering change in return on equity (ROE) and in the firm's overall market value (annual percentage change). Results from these are consistent with the findings reported above, including results from the Lind-Mehlum test.

Second, we test whether performance effects of allocation adjustments may unfold over multiple years. We re-estimated our baseline model with longer performance windows. When increasing the time window by one year to three years, the inverse-U remains significant ($\beta = 0.968$, $p = 0.023$ for the extent of adjustments; $\beta = -5.131$, $p = 0.048$ for the squared term). When increasing the time window by two years, coefficients retain their signs but there is reduced significance ($\beta = 0.349$, $p = 0.246$ for the extent of adjustments; $\beta = -2.379$, $p = 0.255$ for the squared term). When increasing the time window by three years to five years, we continue to find significant curvature and squared term ($\beta = -4.902$, $p = 0.039$) with a positive but imprecise linear term ($\beta = 0.430$, $p = 0.227$). One reason for these results may be that longer windows reduce the number of observations, lowering statistical power. Additional years also increase exposure to independent events (such as macro shocks, supplier disruptions, or competitor moves), which dilute the effects a given year's resource allocation adjustment. We report these estimates in Appendices A to C.

Third, in calculating the extent of adjustments in resource allocation, we added a robustness specification for the weights of SBU changes by using the SBU's share of total firm revenues (instead of total assets). The main effect (H1) retained its signs and statistical significance; $\beta = 0.721$; p-value = 0.017 for the extent of adjustments in resource allocation, and $\beta = -5.256$; p-value = 0.028 for the squared term

(Appendix D, Model 2). Similarly, the effects of the interaction terms (H2/H3) are the same as in the main model.

Fourth, we evaluated concerns about possible endogenous effects where past firm performance might influence both resource allocation adjustments and future firm performance (for example, see Fainshmidt et al., 2017, and Sengul et al., 2019). As a potential initial remedy for this possibility, we ran an OLS model in which we included an additional control for *change* in ROA to further capture the effects of past performance. In our main analysis, we controlled for the lagged firm performance (ROA in t-1) in all regression models. In addition to the above control, in this robustness check we included the past value of the mirrored dependent variable in our regressions, i.e., the change in ROA between years t-4 and t-2. We focused on this period because our main models evaluate the extent of adjustment in resource allocation between years t-1 and t0, and our dependent variable looks at the performance change between t+1 and t+3; hence this analysis captures change in performance over two years, leaving a one-year lag between performance change and the adjustment in resource allocation. The added control of change in ROA (between t-4 and t-2) follows the same logic, capturing two years of change and leaving a one-year lag between performance change and the adjustment in resource allocation (between t-1 and t0). This added control variable accounts for the potential effect of change in performance on the firm's adjustment level. With this added control, we obtained very similar results for both the main and moderation hypotheses.[7, 8] Further, we test whether our findings may hinge on any time-series dynamics associated with the level of ROA in t-1 and estimate all models without the inclusion of ROA in t-1. Results in this model are unchanged, both for the main effect and the interaction effects (β = 0.730; p =

[7] We instituted similar additional controls for the two models using alternative measures of firm performance as the dependent variable (i.e., change in ROE and change in market value) and obtained highly similar results. Full regression result tables for these robustness checks are available from the authors.

[8] Further, we conducted a two-stage least squares (2SLS) regression. As a potential instrument, we considered the extent of adjustment in resource allocation to three-digit SIC code businesses of peer firms (firms operating in the same primary SIC code). This instrument exhibits the required statistical properties with regard to the relevance criterion, as the first-stage F-statistic of 20.155 exceeds the recommended critical value (Stock and Yogo, 2005). In the 2SLS analysis, we found statistical support for the main effect and the pace of environmental change interaction, but not the industry competitiveness interaction. We acknowledge limitations of our instrument regarding the exclusion restriction and report results in Appendix E.

0.005 for the extent of adjustments in resource allocation, and β = -5.202; p = 0.004 for the squared term; Lind–Mehlum test $p < 0.01$ across Models 1–5; p of all interaction effects ≤ 0.02; Appendix F).

Fifth, we performed the impact threshold of a confounding variable (ITCV) test to examine the possible impact of an omitted variable to develop deeper understanding of potential endogeneity issues in our paper (Busenbark, Lange, et al., 2017; Busenbark et al., 2021; Frank, 2000). The ITCV test indicates that to invalidate our results, an omitted variable would have to be correlated with both the extent of adjustment in resource allocation and firm performance at 0.12; this corresponds to an ITCV impact value of 0.0145 (0.120 x 0.120). To put this in perspective, it would take a correlated omitted variable with an impact nearly as large as our strongest variable to overturn the results. When used with "a reasonable set of control variables" (Hubbard et al., 2017, p. 2262), this result suggests that it is unlikely that our findings are driven by an omitted variable bias. The results from the ITCV analysis also show that 30.48 percent of our cases would have to be substituted with cases with no effect in order to invalidate our estimates. The fact that such a large part of our sample would have to be replaced by cases with effects of zero to overturn our inferences leads us to conclude that our results are not likely to occur due to an omitted variable bias. Overall, the ITCV analysis provides additional support for the robustness of our findings.

Sixth, we tested whether our results hold for the shortened period of 2001-2010. As reported in Appendix G, the main effect (H1) retained its signs and statistical significance; β = 0.535; p = 0.042 for the extent of adjustments in resource allocation, and β = -3.574; p = 0.031 for the squared term. However, results for the interaction terms are less strong than in the main model: p = 0.057 for the main interaction effect for *pace of environmental change*, and p = 0.133 for the squared term (H2); similarly, p = 0.096 for the main interaction effect for *industry competitiveness*, and p = 0.138 for the squared term (H3). This attenuation is expected because restricting the window to 2001–2010 reduces statistical power and compresses the variance in our moderators. Our pace of environmental change moderator is built using five-year rolling windows; with a shorter panel there is less independent variation. Because interactions –

particularly the squared interactions in H2/H3 – are power-intensive, this loss of independent information raises standard errors, yielding somewhat larger *p*-values (Cohen, 1988).

Seventh, we examined whether our results depend on simultaneously including financial leverage and the current ratio. When we drop financial leverage and retain only the current ratio, results remain unchanged. Finally, to address the concern that the main variables of interest largely build off the same size proxy, we re-estimated our results without the firm-size control. The main effect (H1) retained its signs and statistical significance; $\beta = 0.715$; *p*-value = 0.005 for the extent of adjustments in resource allocation, and $\beta = -5.080$; *p*-value = 0.005 for the squared term. Similarly, the effects of the interaction terms (H2/H3) are the same as in the main model. These results provide us with confidence that our results are not dependent on the inclusion of firm size (see Appendix H, Model 2).

Supplementary Analyses

We note that because our theory is about heterogeneity in *firms'* conduct of resource allocation adjustments, our analysis is at the firm level rather than at the SBU level. With few exceptions (e.g., Busenbark et al., 2022), studies on resource allocation have focused on SBU level (Busenbark et al., 2017b). At this level, adjustments can be made for unit-specific reasons, and/or be driven by overall HQ preferences and changing inter-SBU synergies (Busenbark et al., 2017b, 2022). Our theory does not focus on SBU performance effects of adjustments; however, as a supplementary analysis, we ran our regressions at the SBU level to examine the relationship between SBU-level allocation adjustments and SBU performance. We added several new control variables at the SBU level, such as past performance of the specific SBU, SBU size, and SBU capital intensity ratio, pace of environmental change, industry competitiveness and munificence, industry profitability and capital expenditure ratio. Results from the SBU-level analysis are largely consistent with our findings from the firm-level regressions, with statistical support for the main effect and for the pace of environmental change interaction, but not for the industry competitiveness interaction (see Appendix I).

We note that resource allocation adjustment goals at the SBU level may differ from those at the firm level. Through allocation adjustments in various units, firms aim to improve their overall performance. Some adjustments may not improve the performance of an individual unit but may instead improve the performance of other units in the firm due to synergies across SBUs. Therefore, it may not be possible for firms to maximize returns of all individual SBUs simultaneously. Accordingly, performance effects of resource allocation adjustments at the SBU and firm levels may differ. Hence, we are particularly encouraged that our findings from the SBU-level analyses are largely consistent with the firm-level analyses.

Further, we noted earlier that different mechanisms are likely to be at play when firms adjust their HQ resource allocation to SBUs. It is frequently assumed in the literature that resource allocation strategies should follow performance prospects of SBUs, i.e., the 'winner picking' approach to resource allocation (Stein, 1997; Arrfelt et al., 2013, 2015). It is possible that alternative mechanisms and motives such as the exploitation of synergies drive resource allocation (Busenbark et al., 2017b). For additional insights, we ran two supplementary analyses to examine whether resource adjustments are motivated by winner picking (i.e., allocations following SBU prospects) or go beyond that.

In the first supplementary analysis, we control for resource allocation adjustments that are based on the performance prospects of individual SBUs as indicated by business unit Tobin's Q (Arrfelt et al., 2015; Lang and Stulz, 1994). Because Tobin's Q cannot be directly measured for a business unit, we followed prior research by Arrfelt et al. (2013, 2015) and approximated the unit's prospects by the mean Tobin's Q of the single-business firms in the same industry as the focal SBU, using the closest SIC level where there are at least five single-business firms. We started at the four-digit level and considered three- and two-digit levels if there were too few firms within specific SICs. As shown in Appendix J, results suggest that the inverse U-shaped relationship between the extent of adjustments at the SBU level and SBU performance continues to hold. This suggests that adjustments are not solely motivated by winner picking (i.e., SBU business prospects), and the inverse U-shaped relationship exists even when other adjustment mechanisms are in play. In terms of the moderating effects, they are supported at the $p<0.10$ level in the full model.

Second, we ran a supplementary analysis controlling for the level of SBU resource misallocation. We follow Arrfelt et al. (2013) in identifying two forms of misallocation (i.e., underinvestment and overinvestment). We check whether each SBU in a given year is (a) getting too much capital relative to its future prospects, as proxied by the average Tobin's q of single-business firms in the same SIC industry (overinvestment); or is (b) getting too little capital relative to its future prospects (underinvestment). If one of those conditions applies, misallocation equals the size of the gap; otherwise, it is zero for that SBU-year. This analysis follows the logic that, by controlling for situations when there is resource misallocation, we essentially control for cases where the firm did *not* follow a winner picking approach. Accordingly, this analysis reveals whether the inverse U-shaped relationship between resource allocation adjustments and performance exists even after accounting for resource misallocation at the SBU level. Results in Appendix K support an inverse U-shaped effect on firm performance when this control is included. The results indicate that the moderating effect of the pace of environmental change, but not of industry competitiveness, is consistent with the main results.

These two supplemental analyses (Appendices J and K) support our theory of the inverse U-shaped relationship between resource allocation adjustments and performance, even after controlling for winner-picking and misallocation. Thus, other mechanisms, including synergy realization (coordinated investments across SBUs) and internal insights into capability development (unknown to outsiders and external capital markets), play an important role in explaining the performance effects of firms' resource allocation adjustments.

In answering our research question, we believe it is important to study internal resource allocations holistically (including both capital flows from HQ to units and flows among units). It would also be useful to evaluate the effects of resource shifts among units; however, Compustat and other datasets do not provide data on the directions of specific flows of investment. Thus, it is not possible to know whether capital was allocated from the HQ to an SBU, or whether it was re-allocated among specific units. One way to study only resource shifts among SBUs is by introducing *the percentage change in total firm CapEx investment* as an additional control. This variable absorbs uniform, across-the-board increases/decreases (i.e., if the HQ increases/decreases the overall investment levels), leaving us with shifts in allocation between the different business units. While this control approach is imperfect, it allows inferences about resource shifts among units. Appendix L reports that the main effect remains significant with expected signs ($\beta = 0.700$, $p = 0.005$ for the extent of adjustments; $\beta = -5.179$, $p = 0.004$ for the squared term) even when controlling for uniform, across-the-board investment increases/decreases. As in the main models, we find support for both moderating effects ($p = 0.016$ for the main interaction effect for pace of environmental change, and $p = 0.015$ for the squared term; $p = 0.006$ for the main interaction effect for industry competitiveness, and $p = 0.009$ for the squared term). In addition, we re-estimated our model with an alternative control variable, *percentage point change in the firm's capital intensity ratio*, i.e., total firm CapEx/total firm assets (rather than changes in the firm's total CapEx investment). Similarly, in these additional tests (Appendix M), we find that the main and moderating effects both persist, even when controlling for uniform, across-the-board increases/decreases in investment levels.

Furthermore, we examined if results vary in a subsample of years where the firm *neither* conducted an exit nor entry. Both the main effect and the competitiveness interaction remained significant (see Appendix N). Substantively, these results suggest that discrete portfolio moves (i.e., exits/entries) are not necessarily the dominant driver of the performance effects behind resource allocation adjustments.

Finally, to capture the temporal patterns of resource allocation adjustments over time, we compute a firm's *resource allocation adjustment rhythm*. To operationalize this concept, we extend the approach of Vermeulen and Barkema (2002) and Shi and Prescott (2012), who study foreign subsidiaries and the process of internationalization, and calculate the kurtosis of a firm's annual extent of adjustments over the window t-3 to t0. A firm's resource allocation adjustment rhythm reflects whether a company changes its resource allocation at an irregular pace, as opposed to a constant pace. Higher adjustment rhythm values indicate infrequent-but-large adjustment spikes combined with substantial periods of inactivity (high kurtosis), while lower adjustment rhythm values reflect steady, constant adjustments over time (low kurtosis). We then estimate models using a firm's *resource allocation adjustment rhythm* as the independent variable of interest – instead of the *extent of adjustment*. This alternative model yields a negative, linear association between a firm's *resource allocation adjustment rhythm* and performance (β = -0.016, p = 0.008; Model 2 in Appendix O). We also test for a quadratic effect of a firm's *resource allocation adjustment rhythm* but do not find evidence of an inverse U-shaped relationship. These results indicate that firms benefit when resource allocation adjustments are paced evenly over time (change values have a flatter distribution) rather than executed in a few bursts (change values have a more concentrated distribution). Hence, concentrating resource allocation adjustments into sporadic spikes of adjustments is detrimental to performance, relative to making stable, regular allocation adjustments. These insights move beyond "how much" change to how change unfolds over time. Together, the results imply that successful firms not only calibrate the *amount* of resource allocation change but also the *rhythm* of change.

DISCUSSION

Adjustment Versus Stability in Investment Allocation

In this paper, we address the structural trade-off between adjustment and stability in investment allocation and open a new line of inquiry in resource allocation research: the extent of adjustments in resource allocation. To develop an initial understanding of the extent of adjustment, we evaluate its performance effects. Our empirical results demonstrate that there is an inverse U-shaped relationship between a multi-business firm's extent of adjustments and its financial performance. The finding of an inverse U-shaped relationship helps to explain the inconsistent results in prior literature about the relationship between resource allocation and firm performance (Busenbark et al., 2017). Our study brings clarity to the puzzle of whether adjustment or stability is superior for resource allocation in diversified firms by demonstrating that neither is generally preferable; rather, firms able to balance the two achieve stronger performance. Our results also show that despite the performance merits of following a balanced approach to resource allocation adjustments, the majority of firms in our sample fall to the left side of the estimated turning point. This pronounced asymmetry helps explain why earlier work reported mixed performance effects – most studies implicitly averaged the drag from under-adjustment with the losses from over-adjustment.

Implications for Productive Investment

Productivity research often focuses on the volume of business investment, yet the outcomes associated with investment also depend on how firms organize their allocation and implementation. Our findings add a within-firm perspective to this debate. They show that the performance consequences of internal investment adjustment are non-linear: insufficient adjustment may leave allocations too rigid as opportunities change, whereas excessive adjustment can disrupt the routines, teams, and capabilities through which expenditure is converted into productive capabilities and operating outcomes. The pronounced concentration of observations below the turning point suggests that insufficient adjustment is the more common organizational problem in our sample. This finding has important implications for understanding productivity – we identify a fundamental mechanism through which headquarters' investment governance shapes the outcomes associated with committed capital. This complements TPI research emphasizing that investment alone is insufficient without organizational alignment, complementary assets, and effective implementation (O'Mahony and van Ark, 2026; Roper and Velu, 2026; Mann, 2026).

Theoretical Implications

Our paper uncovers an alternative, currently overlooked mechanism through which financial resource allocation strategies influence firm performance. Traditionally, studies examined resource allocation statically – i.e., primarily capturing the effects of inefficiencies in resource allocation at one point in time (Busenbark, Wiseman, et al., 2017; Sengul et al., 2019). While acknowledging the importance of this perspective, we argue that an additional driver of the efficiency of resource allocation relates to astute management of *the extent of adjustment* a multi-business firm makes to its resource allocation.

Our theory development and empirical results highlight our contributions to the literature on corporate-level resource allocation. First, we contribute by helping to resolve the structural trade-off firms face between adjustment and stability in resource allocation. While previous literature has provided important insights about whether internal resource allocation is efficient, it has largely overlooked an important dimension of resource allocation: the extent to which firms adjust their resource allocation over time. By empirically validating the performance effects of the extent of resource allocation adjustments, we highlight how corporate headquarters can create value through balancing adjustment and stability in resource allocation.

We aim to reorient the conversation in the financial resource allocation literature beyond its historical focus on static allocation efficiency in diversified firms to the issue of how firms are rewarded for dynamically adjusting their allocation of resources to SBUs. Our perspective allows for examining the performance consequences of the problems faced by diversified firms that have not been adequately captured in the extant resource allocation literature: under-adjustment and over-adjustment in resource allocation. We find that 96% of firms are on the left side of the inverse U curve, indicating that resource allocation under-adjustments are more common than resource allocation over-adjustments. This opens a promising avenue for future research on the extent of resource allocation adjustment as a distinct construct, with particular attention to the prevalent problem of resource allocation under-adjustments.

These perspectives reflect the paradoxical realities firms face when it comes to investment allocation adjustments. Firms can enjoy substantial rewards from undertaking appropriate and increased levels of adjustments in fast-changing or competitive environments, yet face constraints that create inertia and result in under-adjustment. Prior work has highlighted a range of structural and organizational constraints, agency-theoretic issues, and managerial cognition as key drivers of allocation inefficiencies (Arrfelt et al., 2013; Bardolet et al., 2011; Cerar et al., 2023; Scharfstein and Stein, 2000; Xuan, 2009). While our paper does not study the specific cause of resource allocation inertia, our theory suggests that these factors may not only result in misallocations for certain SBUs but are also likely to contribute to an overall firm-wide resource allocation inertia, decreasing the adaptive capability of the firm.

Second, our paper contributes by moving from an average association to a contingency framework that explains not only whether greater adjustment is generally beneficial up to a point (which is also observed by Lovallo et al., 2020), but also *when* greater adjustments to resource allocation are superior to stability, and vice versa. Specifically, we show how the performance payoff of the structural trade-off between adjustment and stability shifts with the environment in which the firm operates. In particular, our results show that the estimated turning point of adjustments moves to the right in fast-changing environments, indicating that firms benefit from greater adjustments in their resource allocation in fast-paced environments. An implication is that attention to the pace of change in the environment provides the opportunity to recalibrate resource allocation to SBUs to achieve superior returns. Firms that can balance sustaining and adjusting their resource allocation, and then modify this balance to take advantage of opportunities in the changing environment are likely to achieve better performance. We also found preliminary evidence that firms operating in highly competitive environments that fail to appropriately adjust their resource allocations will miss significant gains.

With these findings and theory, we aim to shift the financial resource allocation literature beyond its traditional static focus on whether internal resource allocation is efficient and whether HQ allocates capital to the most promising business units. Our theory and results suggest that adopting a dynamic perspective of resource allocation unearths two overlooked allocation challenges: under- and over-adjustments.

Future Research

Our key motivation was to shift the conversation in the financial resource allocation literature beyond its traditional static focus. As a next step, having established the extent of adjustment as a key concept for resource allocation research, we outline what such a shift in the conversation may look like. Future research can build on our finding that the extent of resource allocation adjustment substantially contributes to differences in firm performance by further examining this dimension of resource allocation. The first issue to consider would be why firms differ in their extent of adjustment in the first place. This question becomes important, given that we now know it substantially affects performance. A particularly interesting aspect would be to answer why the majority of multi-business HQs tend to err on the side of under-adjustment. Another puzzle is why some firms make large resource allocation adjustments, while others do not.

An intriguing question is whether the drivers of investment allocation under-adjustment are fundamentally different from those of over-adjustment, or whether common forces lead to both in different contexts. Answering this question can offer insights into how organizations can avoid both extremes. Firms with more modular or flexible structures could redeploy capital more fluidly across units, potentially improving adaptiveness and mitigating structural adjustment challenges (Helfat and Eisenhardt, 2004). Centralized versus decentralized allocation authority is another structural trade-off: a highly centralized HQ might impose rapid adjustments in response to new priorities (leading to abrupt swings), whereas decentralized units might cling to their own resources, resulting in under-adjustment at the corporate level (Sengul and Gimeno, 2013). Yet, a centralized HQ combined with an inertial managerial mindset might steer the firm further away from dynamic adjustments. Thus, a highly germane direction of future research involves how internal governance structures, such as decision rights delegation and budgeting rules, condition a firm's propensity to adjust or not adjust its resource allocation. Does tight central control prevent excessive resource allocation adjustments or foster inertia that misses timely market shifts? Do firms that balance autonomy and control achieve more calibrated adjustments over time? Do internal allocation processes, such as annual CapEx planning or zero-based budgeting, drive or moderate how stable a firm's internal resource allocation becomes? At the same time, it raises the intriguing possibility that structural conditions designed to ensure objectivity and allocation efficiency inadvertently promote excessive stability in adjustments. Understanding these factors will help clarify whether the mechanisms underlying resource allocation under-adjustment and over-adjustment are fundamentally different or whether they stem from common challenges.

A further promising next step is to examine CEO succession and other leadership changes as antecedents of investment allocation adjustments. A new CEO may increase adjustment intensity because succession loosens attachment to inherited capital budgets and creates incentives to signal decisiveness. Yet the opposite may also occur early in tenure, because limited firm-specific knowledge can make newly appointed CEOs cautious about revising unit-level budgets too quickly. Future research should also distinguish one-year adjustment intensity from multi-year adjustment sequences. Firms may achieve substantial portfolio renewal through a sequence of modest annual revisions rather than through large episodic shifts, whereas delayed corrections may appear prudent in single-year data but costly when viewed over longer horizons.

Another promising avenue is to focus on how the key actors at the HQ – and the coalitions and stakeholders that surround them – shape the adjustment versus stability tension. Power dispersion within the top-management team or among SBU heads can tilt outcomes toward either adjustment or stability; when political influence is concentrated, dominant actors can drive bold adjustments, whereas more balanced coalitions tend to dampen movement and preserve the status quo (Greve and Zhang, 2017; Zhang and Greve, 2019). External stakeholders matter as well: securities analysts and the business press can amplify penalties for visible "errors", nudging executives toward incrementalism in some settings yet pressing for dramatic portfolio shuffles in others (Benner and Ranganathan, 2012; Busenbark et al., 2022; Chaturvedi, 2023). A promising next step is to embed decision-maker attributes into the theory of the competing payoffs of adjustment versus stability we developed in our paper. For example, it would be interesting to ask whether CEO power, TMT diversity, or SBU-head tenure shifts the firm toward under- or over-adjustment, and whether heightened analyst coverage or hostile media tenor steepens the penalties for resource allocation mis-adjustments. Doing so would connect our aggregate, firm-level findings to the micro-foundations of resource allocation and open a new dialogue between resource allocation research and the literatures on managerial cognition, power, and stakeholder scrutiny.

Managerial Implications

First, our findings have implications for managers at corporate HQs who are responsible for converting investment budgets into productive assets, capabilities, and growth (Jörden, Adaramoye, and Kuenning, 2024). Calibrating a firm's extent of adjustments in resource allocation in an appropriate way involves several important elements. First, managers need to be cognizant that the extent to which a firm adjusts its resource allocation over time can have a substantial influence on its financial performance. While firms may not be able to place themselves at the highest point of the inverse U curve in a given year for a variety of reasons, they can aim to avoid significantly performance-reducing ranges of too little adjustment and overactive adjustments. Insufficient adjustments over multiple years can be a sign of organizational inertia, potentially jeopardizing successful strategic renewal. In fact, such persistent under-adjustments may be seen as a red flag by the board of directors and investors. Boards can obtain important cues about the extent of adjustments suitable for their firm by evaluating the pace of environmental change and the level of competitiveness. Investment governance – not only investment volume – may therefore be an important lever for improving the effective use of capital within firms.

CONCLUSION

Productivity depends on how financial resources are deployed, combined, and aligned in diversified firms (Alayande and Coyle, 2023; O'Mahony and van Ark, 2026). Productivity research often focuses on the volume of business investment, yet the outcomes associated with investment also depend on how firms organize their allocation and implementation. Our findings add a within-firm perspective to this debate. In this paper, we address the structural trade-off between adjustment and stability in resource allocation by developing understanding of the performance effects of the extent to which firms adjust their resource allocation over time. Our results show that the relationship between a firm's extent of adjustment and performance is inverse U-shaped, indicating that neither adjustment nor stability in resource allocation is generally preferable, but rather that firms with the ability to *balance* the two deliver superior performance. Further, our findings suggest that it is more common for firms to suffer from resource allocation under-adjustments than from resource allocation over-adjustments.

The static perspective adopted in most work on corporate-level investment allocation – focused on whether HQ allocates capital to the most promising business units – has largely overlooked these insights. With these findings, we help explain why decades of work on allocation efficiency has produced mixed results on the resource allocation-performance relationship: most studies did not distinguish the performance drag of under-adjustment from that of over-adjustment, effectively averaging two distinct tendencies. In so doing, the paper has important implications for understanding productivity – we identify a fundamental mechanism through which headquarters' investment governance shapes the outcomes associated with committed capital.

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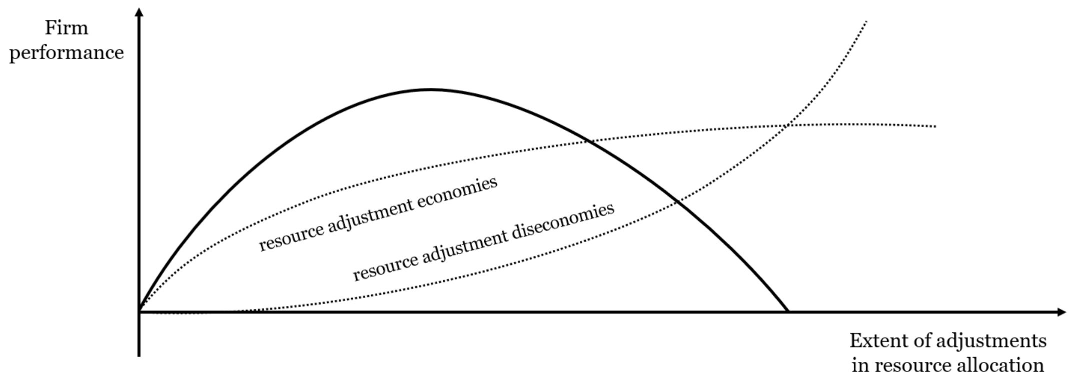
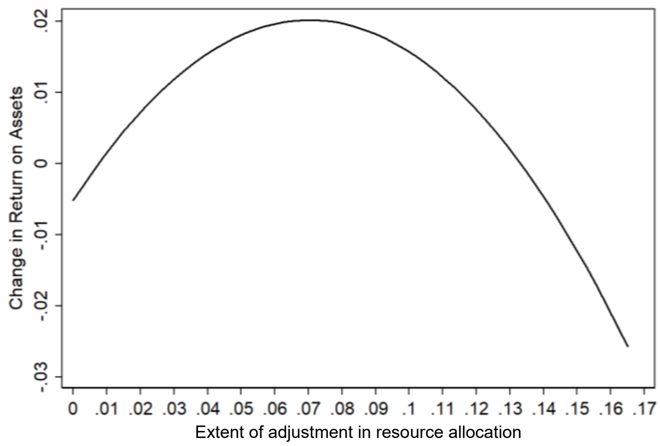
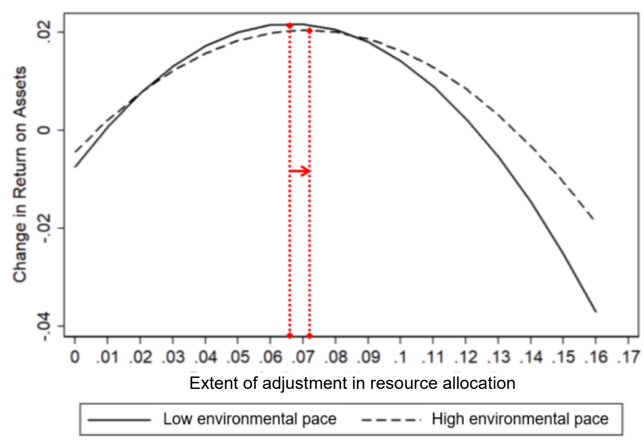


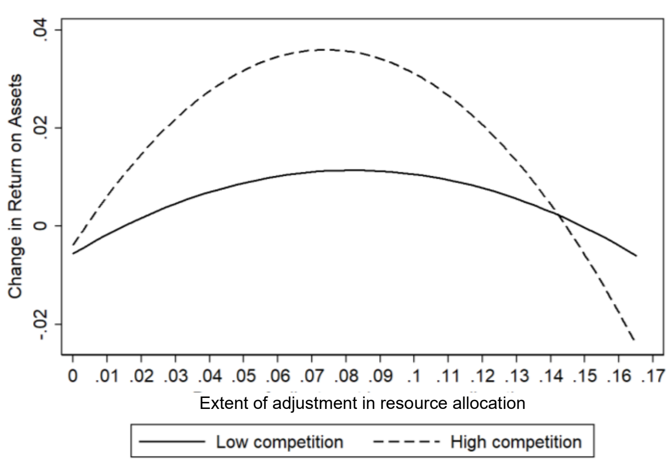
Figure 1. The extent of adjustment in financial resource allocation and firm performance



(a) Main relationship (H1)



(b) Moderating effect of the pace of environmental change (H2)



(c) Moderating effect of industry competitiveness (H3)

Figure 2. Extent of adjustment in financial resource allocation and firm performance

Table I. Descriptive statistics and correlations

		Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Change in ROA between t+1 and t+3	0.00	0.11	1.00																			
2	Change in ROE between t+1 and t+3	0.01	0.16	0.73	1.00																		
3	Extent of adjustments in resource allocation	0.02	0.03	0.03	0.02	1.00																	
4	Pace of environmental change	0.17	1.04	0.00	-0.01	0.05	1.00																
5	Industry competitiveness	0.30	0.18	0.03	0.04	0.06	-0.02	1.00															
6	Firm size	8.24	1.49	-0.01	-0.01	-0.14	-0.02	0.12	1.00														
7	Financial leverage	0.55	0.18	0.04	0.02	-0.13	0.01	0.01	0.31	1.00													
8	Capital intensity ratio	0.05	0.04	-0.04	-0.01	0.43	0.02	0.13	0.04	-0.09	1.00												
9	Current ratio	2.09	1.35	0.01	0.00	0.12	0.01	0.00	-0.39	-0.51	-0.10	1.00											
10	Diversification	0.71	0.36	0.03	0.01	-0.04	0.02	-0.10	0.16	0.08	-0.17	-0.08	1.00										
11	R&D intensity	0.02	0.03	0.09	0.07	0.05	0.00	0.19	0.02	-0.12	-0.16	0.27	0.11	1.00									
12	ROA in t-1	0.05	0.09	-0.08	-0.03	-0.02	-0.04	-0.04	0.09	-0.21	0.12	0.05	-0.05	-0.05	1.00								
13	Change in ROA between t-4 and t-2	0.00	0.09	-0.04	-0.05	0.06	-0.05	0.00	0.02	-0.03	0.08	-0.02	-0.02	-0.05	0.18	1.00							
14	ROE in t-1	0.03	0.12	-0.10	-0.07	-0.02	-0.03	-0.03	0.07	-0.18	0.09	0.00	0.00	-0.11	0.68	0.16	1.00						
15	Industry munificence	0.05	0.85	0.00	0.01	-0.04	-0.67	0.02	-0.02	0.00	-0.03	0.02	0.00	0.02	-0.06	-0.05	-0.05	1.00					
16	Board size	10.19	2.08	-0.02	0.00	-0.10	-0.01	0.01	0.52	0.25	-0.01	-0.31	0.12	-0.06	0.03	0.01	0.04	0.00	1.00				
17	Percentage of inside directors	0.16	0.09	0.02	0.02	0.14	0.03	0.04	-0.23	-0.26	0.11	0.15	-0.07	-0.06	0.00	-0.01	0.00	0.00	-0.15	1.00			
18	Ownership of TMT and directors	0.11	0.16	0.05	0.03	0.09	0.00	-0.04	-0.28	-0.12	-0.02	0.03	-0.06	-0.12	-0.03	0.01	0.02	-0.01	-0.06	0.32	1.00		
19	CEO duality	0.63	0.48	-0.01	-0.03	-0.10	-0.04	0.00	0.16	0.04	-0.10	-0.03	0.01	0.07	0.05	0.01	0.04	0.02	0.02	-0.15	-0.15	1.00	
20	CEO change	0.11	0.31	0.00	-0.01	-0.01	0.02	-0.01	0.02	0.06	-0.01	-0.03	0.02	0.03	-0.09	-0.04	-0.09	0.01	0.03	0.01	0.00	-0.20	1.00

Correlations greater than 0.04 are significant at $p < 0.05$, and those greater than 0.05 are significant at $p < 0.01$

Table II. Fixed effects regression firm-level analysis of change in ROA

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.721	0.005	0.980	0.001	1.561	0.001	1.745	0.000
Extent of adjustments in resource allocation^2			-5.126	0.005	-7.590	0.000	-10.728	0.001	-12.551	0.000
Extent of adjustments X Environmental change					-2.017	0.013			-1.910	0.016
Extent of adjustments^2 X Environmental change					19.175	0.012			18.114	0.015
Extent of adjustments X Competitiveness							2.937	0.006	2.704	0.011
Extent of adjustments^2 X Competitiveness							-21.015	0.013	-18.925	0.024
Pace of environmental change			-0.004	0.071	0.034	0.031	-0.004	0.056	0.031	0.040
Industry competitiveness			0.044	0.069	0.048	0.052	0.008	0.782	0.013	0.626
Firm size	0.001	0.889	0.003	0.606	0.002	0.650	0.002	0.666	0.002	0.703
Financial leverage	0.056	0.078	0.059	0.065	0.060	0.062	0.057	0.075	0.058	0.071
Capital intensity ratio	-0.102	0.362	-0.155	0.158	-0.165	0.127	-0.167	0.141	-0.175	0.118
Current ratio	0.002	0.708	0.001	0.809	0.001	0.823	0.001	0.901	0.001	0.904
Diversification	0.040	0.004	0.039	0.005	0.037	0.006	0.039	0.005	0.037	0.006
R&D intensity	0.695	0.009	0.682	0.010	0.688	0.008	0.667	0.010	0.674	0.009
ROA in t-1	-0.020	0.706	-0.020	0.708	-0.021	0.702	-0.019	0.732	-0.019	0.723
Industry munificence	-0.001	0.846	-0.004	0.275	-0.010	0.008	-0.004	0.237	-0.010	0.008
Board size	-0.001	0.677	-0.001	0.625	-0.001	0.602	-0.001	0.594	-0.002	0.576
Percentage of inside directors	0.062	0.026	0.057	0.036	0.057	0.036	0.053	0.046	0.054	0.045
Ownership of TMT and directors	0.069	0.006	0.063	0.013	0.060	0.017	0.060	0.015	0.058	0.021
CEO duality	-0.007	0.181	-0.007	0.173	-0.007	0.188	-0.007	0.193	-0.007	0.208
CEO change	-0.009	0.224	-0.009	0.218	-0.009	0.227	-0.009	0.198	-0.009	0.206
Constant	-0.076	0.213	-0.079	0.188	-0.077	0.203	-0.081	0.174	-0.080	0.187
Observations	2,814		2,814		2,814		2,814		2,814	
Number of firms	354		354		354		354		354	
F-value	2.904	0.000	2.615	0.000	3.029	0.000	2.575	0.000	2.942	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.004		0.000		0.002		0.000

ONLINE APPENDICES

Appendix A. Robustness test: Fixed effects regression firm-level analysis of change in ROA, using an increased time window in the dependent variable (one additional year)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.968	0.023	1.219	0.005	1.661	0.022	1.837	0.012
Extent of adjustments in resource allocation^2			-5.131	0.048	-7.464	0.008	-7.686	0.087	-9.416	0.041
Extent of adjustments X Environmental change					-2.082	0.028			-2.043	0.028
Extent of adjustments^2 X Environmental change					19.920	0.027			19.506	0.027
Extent of adjustments X Competitiveness							2.083	0.149	1.808	0.216
Extent of adjustments^2 X Competitiveness							-5.424	0.606	-3.097	0.777
Pace of environmental change			-0.004	0.178	0.034	0.061	-0.004	0.138	0.033	0.065
Industry competitiveness			0.053	0.157	0.057	0.131	0.023	0.597	0.030	0.497
Firm size	0.008	0.447	0.010	0.374	0.010	0.388	0.010	0.383	0.010	0.396
Financial leverage	0.033	0.301	0.034	0.282	0.033	0.289	0.033	0.303	0.032	0.307
Capital intensity ratio	-0.036	0.798	-0.116	0.343	-0.124	0.313	-0.112	0.366	-0.118	0.337
Current ratio	-0.006	0.326	-0.007	0.273	-0.007	0.274	-0.007	0.266	-0.007	0.270
Diversification	0.043	0.011	0.040	0.016	0.038	0.021	0.039	0.017	0.037	0.023
R&D intensity	0.951	0.003	0.857	0.007	0.824	0.006	0.836	0.008	0.805	0.008
ROA in t-1	-0.002	0.961	-0.004	0.932	-0.006	0.906	-0.006	0.900	-0.008	0.873
Industry munificence	-0.007	0.128	-0.010	0.033	-0.016	0.001	-0.011	0.024	-0.017	0.001
Board size	-0.002	0.662	-0.002	0.600	-0.002	0.565	-0.002	0.577	-0.002	0.545
Percentage of inside directors	0.068	0.061	0.064	0.071	0.064	0.070	0.062	0.081	0.062	0.078
Ownership TMT and directors	0.126	0.001	0.115	0.001	0.112	0.002	0.114	0.001	0.111	0.002
CEO duality	-0.010	0.153	-0.009	0.167	-0.009	0.177	-0.009	0.184	-0.009	0.194
CEO change	-0.002	0.820	-0.002	0.807	-0.002	0.825	-0.002	0.757	-0.002	0.775
Constant	-0.125	0.132	-0.124	0.133	-0.119	0.147	-0.127	0.123	-0.123	0.137
Observations	2,584		2,584		2,584		2,584		2,584	
Number of firms	341		341		341		341		341	
F-value	3.405	0.000	3.055	0.000	3.119	0.000	2.920	0.000	3.004	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.057		0.008		0.140		0.068

Appendix B. Robustness test: Fixed effects regression firm-level analysis of change in ROA, using an increased time window in the dependent variable (two additional years)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.349	0.246	0.404	0.181	0.278	0.631	0.351	0.540
Extent of adjustments in resource allocation^2			-2.379	0.255	-2.199	0.310	-0.609	0.882	-0.712	0.862
Extent of adjustments X Environmental change					0.045	0.960			-0.035	0.969
Extent of adjustments^2 X Environmental change					-4.526	0.585			-3.621	0.655
Extent of adjustments X Competitiveness							-0.526	0.734	-0.466	0.762
Extent of adjustments^2 X Competitiveness							10.105	0.447	9.070	0.490
Pace of environmental change			-0.008	0.151	0.015	0.601	-0.008	0.143	0.015	0.589
Industry competitiveness			0.037	0.297	0.040	0.255	0.039	0.358	0.042	0.323
Firm size	0.016	0.166	0.016	0.153	0.016	0.163	0.016	0.151	0.016	0.161
Financial leverage	0.046	0.282	0.047	0.273	0.049	0.251	0.047	0.275	0.049	0.254
Capital intensity ratio	0.186	0.244	0.152	0.336	0.145	0.355	0.158	0.320	0.150	0.339
Current ratio	-0.004	0.317	-0.005	0.284	-0.005	0.251	-0.005	0.292	-0.005	0.259
Diversification	0.054	0.012	0.054	0.012	0.052	0.017	0.053	0.013	0.051	0.019
R&D intensity	1.019	0.030	1.017	0.032	1.006	0.035	1.019	0.032	1.007	0.036
ROA in t-1	0.039	0.380	0.036	0.418	0.039	0.381	0.034	0.459	0.037	0.419
Industry munificence	-0.028	0.007	-0.033	0.007	-0.035	0.001	-0.033	0.007	-0.035	0.001
Board size	-0.000	0.908	-0.000	0.947	-0.000	0.930	-0.000	0.938	-0.000	0.921
Percentage of inside directors	0.091	0.017	0.090	0.018	0.090	0.018	0.090	0.018	0.091	0.017
Ownership TMT and directors	0.144	0.000	0.139	0.000	0.136	0.000	0.140	0.000	0.137	0.000
CEO duality	-0.012	0.105	-0.012	0.117	-0.012	0.118	-0.012	0.119	-0.012	0.121
CEO change	0.001	0.882	0.000	0.948	0.001	0.906	0.000	0.969	0.001	0.926
Constant	-0.238	0.030	-0.234	0.033	-0.230	0.034	-0.234	0.033	-0.230	0.033
Observations	2,344		2,344		2,344		2,344		2,344	
Number of firms	319		319		319		319		319	
F-value	3.281	0.000	2.613	0.000	2.915	0.000	2.462	0.000	2.813	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.146		0.231		1.000		1.000

Appendix C. Robustness test: Fixed effects regression firm-level analysis of change in ROA, using an increased time window in the dependent variable (three additional years)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.430	0.227	0.640	0.059	0.914	0.176	1.079	0.106
Extent of adjustments in resource allocation^2			-4.902	0.039	-6.250	0.007	-8.955	0.050	-9.947	0.029
Extent of adjustments X Environmental change					-1.207	0.179			-1.086	0.222
Extent of adjustments^2 X Environmental change					8.731	0.295			7.430	0.363
Extent of adjustments X Competitiveness							1.950	0.243	1.834	0.266
Extent of adjustments^2 X Competitiveness							-18.236	0.216	-17.386	0.230
Pace of environmental change			-0.004	0.426	0.034	0.191	-0.004	0.412	0.032	0.215
Industry competitiveness			0.017	0.561	0.022	0.443	-0.005	0.872	0.001	0.969
Firm size	0.022	0.105	0.023	0.092	0.022	0.101	0.022	0.099	0.022	0.108
Financial leverage	0.030	0.559	0.033	0.510	0.034	0.499	0.032	0.526	0.033	0.513
Capital intensity ratio	0.204	0.172	0.171	0.241	0.163	0.259	0.166	0.249	0.159	0.268
Current ratio	-0.001	0.885	-0.002	0.731	-0.002	0.655	-0.002	0.697	-0.003	0.626
Diversification	0.044	0.073	0.044	0.071	0.041	0.101	0.045	0.063	0.041	0.091
R&D intensity	0.038	0.953	0.124	0.852	0.092	0.886	0.107	0.869	0.078	0.902
ROA in t-1	0.075	0.275	0.079	0.242	0.081	0.234	0.081	0.225	0.083	0.218
Industry munificence	-0.019	0.036	-0.022	0.050	-0.025	0.006	-0.022	0.050	-0.025	0.006
Board size	-0.002	0.515	-0.002	0.554	-0.002	0.533	-0.002	0.545	-0.002	0.525
Percentage of inside directors	0.103	0.010	0.102	0.010	0.102	0.010	0.099	0.012	0.100	0.012
Ownership TMT and directors	0.064	0.071	0.065	0.062	0.062	0.079	0.063	0.073	0.059	0.091
CEO duality	-0.016	0.052	-0.016	0.054	-0.016	0.057	-0.016	0.056	-0.016	0.059
CEO change	0.009	0.318	0.008	0.359	0.008	0.334	0.008	0.360	0.008	0.333
Constant	-0.240	0.059	-0.246	0.051	-0.239	0.057	-0.246	0.051	-0.240	0.057
Observations	2,110		2,110		2,110		2,110		2,110	
Number of firms	303		303		303		303		303	
F-value	2.518	0.000	2.599	0.000	3.134	0.000	2.429	0.000	2.952	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.113		0.029		0.088		0.053

Appendix D. Robustness test: Fixed effects regression firm-level analysis of change in ROA, using SBU revenue share as an alternative weight

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.721	0.017	0.992	0.003	1.618	0.004	1.818	0.002
Extent of adjustments in resource allocation^2			-5.256	0.028	-7.456	0.005	-12.044	0.008	-13.660	0.004
Extent of adjustments X Environmental change					-1.883	0.054			-1.755	0.072
Extent of adjustments^2 X Environmental change					15.885	0.052			14.801	0.069
Extent of adjustments X Competitiveness							3.068	0.014	2.882	0.019
Extent of adjustments^2 X Competitiveness							-24.293	0.024	-22.707	0.032
Pace of environmental change			-0.004	0.071	0.035	0.089	-0.004	0.061	0.032	0.117
Industry competitiveness			0.045	0.068	0.049	0.047	0.005	0.849	0.012	0.678
Firm size	0.001	0.889	0.002	0.647	0.003	0.627	0.002	0.721	0.002	0.696
Financial leverage	0.056	0.078	0.058	0.070	0.059	0.064	0.056	0.078	0.057	0.071
Capital intensity ratio	-0.102	0.362	-0.160	0.141	-0.158	0.148	-0.174	0.122	-0.171	0.129
Current ratio	0.002	0.708	0.001	0.801	0.001	0.845	0.001	0.891	0.000	0.924
Diversification	0.040	0.004	0.038	0.005	0.036	0.007	0.038	0.005	0.036	0.006
R&D intensity	0.695	0.009	0.695	0.009	0.690	0.008	0.677	0.009	0.674	0.009
ROA in t-1	-0.020	0.706	-0.023	0.677	-0.023	0.672	-0.022	0.688	-0.022	0.682
Industry munificence	-0.001	0.846	-0.004	0.276	-0.007	0.079	-0.004	0.254	-0.007	0.078
Board size	-0.001	0.677	-0.001	0.639	-0.001	0.586	-0.001	0.614	-0.002	0.567
Percentage of inside directors	0.062	0.026	0.059	0.033	0.058	0.038	0.057	0.035	0.056	0.040
Ownership TMT and directors	0.069	0.006	0.062	0.013	0.060	0.017	0.060	0.015	0.058	0.019
CEO duality	-0.007	0.181	-0.007	0.175	-0.007	0.165	-0.007	0.196	-0.007	0.185
CEO change	-0.009	0.224	-0.009	0.222	-0.009	0.234	-0.009	0.198	-0.009	0.210
Constant	-0.076	0.213	-0.076	0.207	-0.077	0.205	-0.079	0.188	-0.080	0.187
Observations	2,814		2,814		2,814		2,814		2,814	
Number of firms	354		354		354		354		354	
F-value	2.904	0.000	2.567	0.000	2.567	0.000	2.427	0.000	2.432	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.029		0.005		0.011		0.005

Appendix E. Two-stage least-squares (2SLS) firm-level regression analysis of change in ROA

	Model 1		Model 2		Model 3		Model 4	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustment in resource allocation	1.052	0.034	1.118	0.033	4.470	0.156	3.280	0.152
Extent of adjustments in resource allocation^2	-7.232	0.033	-8.031	0.031	-30.414	0.222	-20.735	0.206
Extent of adjustments x Environmental change			-1.912	0.047			-2.063	0.086
Extent of adjustments^2 x Environmental change			18.103	0.047			19.241	0.089
Extent of adjustments x Competitiveness					9.730	0.215	5.935	0.245
Extent of adjustments^2 x Competitiveness					-70.635	0.306	-36.316	0.369
Pace of environmental change	-0.004	0.065	0.032	0.086	-0.005	0.046	0.035	0.127
Industry competitiveness	0.048	0.051	0.050	0.041	-0.072	0.431	-0.028	0.669
Firm size	0.003	0.583	0.002	0.670	0.002	0.660	0.002	0.716
Financial leverage	0.063	0.051	0.063	0.052	0.058	0.071	0.060	0.061
Capital intensity ratio	-0.180	0.069	-0.180	0.062	-0.267	0.048	-0.224	0.034
Current ratio	0.001	0.887	0.001	0.858	-0.002	0.709	-0.000	0.924
Diversification	0.038	0.005	0.037	0.005	0.036	0.005	0.035	0.006
R&D intensity	0.668	0.012	0.671	0.011	0.582	0.028	0.607	0.019
ROA in t-1	-0.020	0.706	-0.022	0.682	-0.011	0.837	-0.019	0.727
Industry munificence	-0.004	0.278	-0.010	0.016	-0.004	0.196	-0.010	0.021
Board size	-0.002	0.580	-0.002	0.565	-0.002	0.491	-0.002	0.509
Percentage of inside directors	0.061	0.023	0.062	0.024	0.047	0.098	0.054	0.048
Ownership TMT and directors	0.053	0.031	0.051	0.039	0.043	0.092	0.044	0.085
CEO duality	-0.008	0.129	-0.008	0.138	-0.007	0.179	-0.007	0.183
CEO change	-0.008	0.251	-0.008	0.264	-0.010	0.190	-0.009	0.215
Constant	-0.081	0.173	-0.076	0.208	-0.096	0.111	-0.088	0.144
Observations	2,790		2,790		2,790		2,790	
Number of firms	353		353		353		353	
F-value	2.510	0.000	2.557	0.000	2.356	0.000	2.436	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)		0.024		0.022		0.143		0.143

Appendix F. Robustness test: Fixed effects regression firm-level analysis of change in ROA, without controlling for ROA in t-1

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.730	0.005	0.989	0.001	1.575	0.001	1.760	0.000
Extent of adjustments in resource allocation^2			-5.202	0.004	-7.668	0.000	-10.879	0.001	-12.706	0.000
Extent of adjustments X Environmental change					-2.018	0.012			-1.909	0.015
Extent of adjustments^2 X Environmental change					19.158	0.012			18.076	0.015
Extent of adjustments X Competitiveness							2.967	0.006	2.736	0.010
Extent of adjustments^2 X Competitiveness							-21.390	0.011	-19.320	0.020
Pace of environmental change			-0.004	0.081	0.034	0.030	-0.004	0.064	0.032	0.038
Industry competitiveness			0.044	0.071	0.047	0.053	0.007	0.798	0.013	0.640
Firm size	0.000	0.960	0.002	0.679	0.002	0.723	0.002	0.735	0.002	0.772
Financial leverage	0.059	0.095	0.062	0.081	0.063	0.078	0.060	0.092	0.061	0.089
Capital intensity ratio	-0.117	0.295	-0.170	0.124	-0.180	0.098	-0.180	0.110	-0.189	0.091
Current ratio	0.002	0.710	0.001	0.813	0.001	0.827	0.001	0.905	0.001	0.909
Diversification	0.040	0.004	0.039	0.005	0.037	0.007	0.039	0.005	0.037	0.006
R&D intensity	0.706	0.008	0.693	0.009	0.699	0.007	0.676	0.009	0.684	0.008
Industry munificence	-0.000	0.873	-0.003	0.315	-0.010	0.010	-0.004	0.271	-0.010	0.010
Board size	-0.001	0.686	-0.001	0.632	-0.001	0.609	-0.001	0.599	-0.001	0.581
Percentage of inside directors	0.062	0.027	0.057	0.036	0.057	0.036	0.053	0.046	0.054	0.045
Ownership TMT and directors	0.069	0.006	0.063	0.013	0.060	0.018	0.060	0.016	0.057	0.022
CEO duality	-0.007	0.182	-0.007	0.173	-0.007	0.188	-0.007	0.194	-0.007	0.209
CEO change	-0.008	0.237	-0.009	0.231	-0.008	0.240	-0.009	0.208	-0.009	0.216
Constant	-0.075	0.220	-0.079	0.189	-0.077	0.203	-0.081	0.176	-0.080	0.188
Observations	2,814		2,814		2,814		2,814		2,814	
Number of firms	354		354		354		354		354	
F-value	2.940	0.000	2.683	0.000	3.142	0.000	2.619	0.000	3.019	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.003		0.000		0.001		0.000

Appendix G. Robustness test: Fixed effects regression firm-level analysis of change in ROA, restricted to the time period 2001-2010

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.535	0.042	0.804	0.004	1.140	0.029	1.352	0.011
Extent of adjustments in resource allocation^2			-3.574	0.031	-5.368	0.003	-7.145	0.031	-8.527	0.012
Extent of adjustments X Environmental change					-1.527	0.057			-1.462	0.065
Extent of adjustments^2 X Environmental change					11.419	0.133			10.806	0.148
Extent of adjustments X Competitiveness							2.108	0.096	1.932	0.124
Extent of adjustments^2 X Competitiveness							-13.071	0.138	-11.769	0.187
Pace of environmental change			-0.004	0.349	0.042	0.081	-0.005	0.306	0.040	0.093
Industry competitiveness			0.039	0.132	0.048	0.065	0.008	0.793	0.019	0.530
Firm size	0.012	0.229	0.013	0.190	0.012	0.223	0.012	0.205	0.011	0.239
Financial leverage	0.024	0.534	0.024	0.531	0.025	0.520	0.023	0.556	0.024	0.541
Capital intensity ratio	-0.121	0.245	-0.161	0.109	-0.172	0.086	-0.164	0.103	-0.175	0.082
Current ratio	0.004	0.527	0.003	0.586	0.003	0.686	0.003	0.640	0.002	0.732
Diversification	0.054	0.008	0.055	0.009	0.050	0.015	0.054	0.009	0.050	0.016
R&D intensity	0.713	0.028	0.697	0.030	0.669	0.033	0.690	0.029	0.663	0.032
ROA in t-1	0.013	0.787	0.013	0.783	0.015	0.756	0.014	0.777	0.015	0.752
Industry munificence	-0.012	0.088	-0.014	0.097	-0.019	0.005	-0.014	0.097	-0.018	0.005
Board size	0.001	0.791	0.001	0.783	0.001	0.811	0.001	0.808	0.000	0.835
Percentage of inside directors	0.067	0.061	0.066	0.063	0.067	0.060	0.063	0.072	0.064	0.068
Ownership TMT and directors	0.092	0.001	0.087	0.001	0.083	0.002	0.085	0.002	0.081	0.002
CEO duality	-0.007	0.328	-0.006	0.357	-0.006	0.403	-0.006	0.404	-0.005	0.448
CEO change	-0.016	0.087	-0.017	0.075	-0.016	0.084	-0.017	0.074	-0.016	0.083
Constant	-0.183	0.077	-0.181	0.076	-0.171	0.094	-0.182	0.073	-0.172	0.090
Observations	2,038		2,038		2,038		2,038		2,038	
Number of firms	322		322		322		322		322	
F-value	2.906	0.000	2.636	0.000	3.480	0.000	2.466	0.000	3.233	
Lind-Mehlum test for presence of inverse U (*p-value*)				0.021		0.002		0.024		0.010

Appendix H. Robustness test: Fixed effects regression firm-level analysis of change in ROA, without controlling for firm size

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.715	0.005	0.975	0.001	1.559	0.001	1.743	0.000
Extent of adjustments in resource allocation^2			-5.080	0.005	-7.555	0.000	-10.719	0.001	-12.546	0.000
Extent of adjustments X Environmental change					-2.022	0.012			-1.914	0.016
Extent of adjustments^2 X Environmental change					19.226	0.012			18.151	0.015
Extent of adjustments X Competitiveness							2.951	0.006	2.716	0.011
Extent of adjustments^2 X Competitiveness							-21.133	0.013	-19.024	0.023
Pace of environmental change			-0.004	0.068	0.034	0.031	-0.004	0.054	0.031	0.040
Industry competitiveness			0.043	0.073	0.046	0.053	0.006	0.820	0.012	0.654
Financial leverage	0.056	0.080	0.058	0.069	0.059	0.066	0.057	0.079	0.057	0.075
Capital intensity ratio	-0.103	0.358	-0.156	0.153	-0.166	0.123	-0.168	0.136	-0.176	0.115
Current ratio	0.002	0.707	0.001	0.804	0.001	0.819	0.001	0.897	0.001	0.901
Diversification	0.040	0.004	0.039	0.005	0.037	0.007	0.039	0.005	0.037	0.006
R&D intensity	0.696	0.008	0.685	0.009	0.691	0.008	0.670	0.010	0.677	0.008
ROA in t-1	-0.020	0.712	-0.019	0.722	-0.020	0.715	-0.018	0.743	-0.018	0.734
Industry munificence	-0.001	0.841	-0.004	0.262	-0.010	0.008	-0.004	0.227	-0.010	0.008
Board size	-0.001	0.694	-0.001	0.672	-0.001	0.643	-0.001	0.633	-0.001	0.611
Percentage of inside directors	0.061	0.028	0.054	0.046	0.055	0.045	0.050	0.057	0.052	0.054
Ownership TMT and directors	0.068	0.002	0.060	0.008	0.057	0.012	0.058	0.010	0.056	0.014
CEO duality	-0.007	0.181	-0.007	0.170	-0.007	0.185	-0.007	0.191	-0.007	0.206
CEO change	-0.009	0.224	-0.009	0.220	-0.009	0.228	-0.009	0.199	-0.009	0.207
Constant	-0.070	0.043	-0.058	0.094	-0.058	0.095	-0.064	0.064	-0.064	0.066
Observations	2,814		2,814		2,814		2,814		2,814	
Number of firms	354		354		354		354		354	
F-value	3.082	0.000	2.710	0.000	3.125	0.000	2.621	0.000	2.990	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.004		0.000		0.002		0.000

Appendix I. Supplementary analysis: Fixed effects SBU-level regression analysis of change in ROA

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.352	0.036	0.356	0.035	-0.035	0.894	-0.018	0.946
Extent of adjustments in resource allocation^2			-0.378	0.038	-0.417	0.023	0.037	0.902	0.031	0.919
Extent of adjustments X Environmental change					-0.229	0.001			-0.208	0.002
Extent of adjustments^2 X Environmental change					1.213	0.011			0.943	0.084
Extent of adjustments X Competitiveness							1.415	0.097	1.445	0.092
Extent of adjustments^2 X Competitiveness							-1.701	0.221	-2.025	0.134
Pace of environmental change			0.003	0.334	0.010	0.005	0.003	0.288	0.010	0.005
Industry competitiveness			-0.008	0.858	-0.006	0.883	-0.028	0.534	-0.027	0.553
Unit size	-0.004	0.718	-0.004	0.724	-0.004	0.713	-0.004	0.722	-0.004	0.708
Financial leverage	0.042	0.234	0.043	0.241	0.043	0.239	0.044	0.225	0.045	0.223
SBU capital intensity ratio	-0.085	0.514	-0.133	0.305	-0.136	0.292	-0.146	0.279	-0.151	0.261
Current ratio	-0.004	0.545	-0.004	0.571	-0.003	0.613	-0.003	0.603	-0.003	0.635
Diversification	0.018	0.295	0.018	0.293	0.018	0.303	0.018	0.303	0.017	0.316
R&D intensity	2.604	0.004	2.529	0.005	2.527	0.005	2.555	0.004	2.553	0.005
ROA in t-1	-0.158	0.034	-0.160	0.035	-0.160	0.035	-0.161	0.033	-0.161	0.033
Industry munificence	-0.010	0.042	-0.009	0.070	-0.009	0.132	-0.008	0.089	-0.009	0.129
Industry ROA	-0.000	0.981	-0.000	0.991	-0.000	0.987	-0.000	0.947	-0.000	0.949
Industry capital intensity ratio	0.266	0.157	0.266	0.163	0.261	0.175	0.247	0.199	0.243	0.206
Board size	-0.003	0.275	-0.003	0.245	-0.003	0.258	-0.003	0.269	-0.003	0.281
Percentage of inside directors	0.066	0.240	0.068	0.235	0.070	0.223	0.068	0.231	0.071	0.217
Ownership of TMT and directors	0.087	0.010	0.085	0.013	0.085	0.012	0.086	0.012	0.086	0.012
CEO duality	-0.007	0.294	-0.007	0.310	-0.007	0.327	-0.008	0.281	-0.007	0.305
CEO change	-0.002	0.836	-0.002	0.831	-0.002	0.811	-0.002	0.805	-0.002	0.796
Constant	-0.033	0.758	-0.033	0.760	-0.034	0.748	-0.029	0.786	-0.030	0.777
Observations	4,496		4,496		4,496		4,496		4,496	
F-value	3.141	0.000	3.900	0.000	5.224	0.000	3.254	0.000	4.228	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.031		0.018		0.457		0.473

Appendix J. Supplementary analysis: Fixed effects SBU-level regression analysis of change in ROA controlling for SBU prospects

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.444	0.048	0.417	0.085	-0.163	0.684	-0.407	0.406
Extent of adjustments in resource allocation^2			-0.526	0.032	-0.561	0.021	0.305	0.615	1.062	0.214
Extent of adjustments X Environmental change					-0.208	0.356			-1.265	0.074
Extent of adjustments^2 X Environmental change					2.028	0.219			11.627	0.055
Extent of adjustments X Competitiveness							3.641	0.121	5.119	0.079
Extent of adjustments^2 X Competitiveness							-5.716	0.237	-15.159	0.071
Pace of environmental change	-0.001	0.819	-0.001	0.605	0.000	0.983	-0.001	0.583	0.014	0.472
Industry competitiveness	0.063	0.552	0.068	0.525	0.068	0.524	0.014	0.913	-0.004	0.976
Unit size	-0.014	0.364	-0.014	0.360	-0.014	0.350	-0.013	0.348	-0.013	0.349
Financial leverage	0.000	0.997	-0.001	0.989	-0.001	0.978	0.003	0.959	0.003	0.950
SBU capital intensity ratio	-0.123	0.465	-0.142	0.398	-0.132	0.443	-0.164	0.364	-0.155	0.360
Current ratio	-0.010	0.239	-0.010	0.245	-0.010	0.239	-0.009	0.243	-0.010	0.231
Diversification	-0.022	0.297	-0.021	0.329	-0.021	0.322	-0.017	0.434	-0.018	0.399
R&D intensity	2.837	0.010	2.725	0.013	2.715	0.013	2.764	0.011	2.748	0.012
ROA in t-1	-0.198	0.044	-0.205	0.043	-0.205	0.043	-0.206	0.041	-0.204	0.040
SBU prospects	0.000	0.329	0.000	0.308	0.000	0.298	0.000	0.398	0.000	0.378
Industry munificence	-0.009	0.185	-0.009	0.184	-0.009	0.245	-0.009	0.170	-0.007	0.340
Industry ROA	0.314	0.190	0.322	0.183	0.318	0.191	0.307	0.203	0.299	0.217
Industry capital intensity ratio	0.001	0.872	0.002	0.827	0.002	0.826	0.002	0.836	0.002	0.800
Board size	-0.004	0.258	-0.004	0.224	-0.004	0.214	-0.004	0.233	-0.004	0.235
Percentage of inside directors	0.136	0.124	0.141	0.118	0.141	0.117	0.139	0.126	0.138	0.128
Ownership of TMT and directors	0.088	0.043	0.087	0.044	0.089	0.042	0.086	0.049	0.089	0.044
CEO duality	-0.006	0.493	-0.006	0.527	-0.006	0.512	-0.006	0.518	-0.006	0.482
CEO change	0.004	0.735	0.005	0.730	0.005	0.730	0.005	0.724	0.005	0.711
Constant	0.070	0.636	0.068	0.640	0.071	0.622	0.070	0.623	0.072	0.611
Observations	2,699		2,699		2,699		2,699		2,699	
F-value	2.730	0.000	3.460	0.000	3.960	0.000	2.220	0.002	2.510	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.024		0.043		0.342		0.203

Appendix K. Supplementary analysis: Fixed effects SBU-level regression analysis of change in ROA controlling for SBU misallocation

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.372	0.024	0.378	0.023	0.012	0.964	0.028	0.914
Extent of adjustments in resource allocation^2			-0.446	0.011	-0.481	0.006	-0.057	0.845	-0.064	0.824
Extent of adjustments X Environmental change					-0.209	0.002			-0.188	0.006
Extent of adjustments^2 X Environmental change					1.052	0.034			0.785	0.155
Extent of adjustments X Competitiveness							1.314	0.120	1.344	0.113
Extent of adjustments^2 X Competitiveness							-1.572	0.249	-1.839	0.164
Pace of environmental change	0.003	0.210	0.003	0.280	0.009	0.007	0.003	0.239	0.010	0.007
Industry competitiveness	-0.015	0.731	-0.012	0.787	-0.010	0.811	-0.031	0.503	-0.030	0.519
Unit size	-0.005	0.661	-0.005	0.625	-0.005	0.616	-0.005	0.626	-0.005	0.614
Financial leverage	0.038	0.311	0.039	0.302	0.039	0.300	0.040	0.282	0.041	0.280
SBU capital intensity ratio	-0.196	0.290	-0.243	0.184	-0.244	0.181	-0.250	0.181	-0.252	0.174
Current ratio	-0.004	0.546	-0.004	0.573	-0.003	0.609	-0.003	0.603	-0.003	0.629
Diversification	0.018	0.316	0.018	0.307	0.018	0.317	0.017	0.316	0.017	0.328
R&D intensity	2.632	0.003	2.559	0.004	2.556	0.004	2.581	0.004	2.579	0.004
ROA in t-1	-0.155	0.037	-0.159	0.035	-0.159	0.036	-0.160	0.033	-0.160	0.034
SBU misallocation	0.249	0.143	0.268	0.107	0.263	0.115	0.254	0.123	0.251	0.130
Industry munificence	-0.008	0.082	-0.008	0.096	-0.008	0.160	-0.007	0.124	-0.008	0.154
Industry ROA	0.001	0.905	0.001	0.895	0.001	0.900	0.000	0.942	0.000	0.940
Industry capital intensity ratio	0.265	0.152	0.262	0.157	0.257	0.168	0.244	0.192	0.241	0.198
Board size	-0.003	0.314	-0.003	0.280	-0.003	0.294	-0.003	0.302	-0.003	0.314
Percentage of inside directors	0.065	0.251	0.068	0.234	0.070	0.222	0.068	0.230	0.071	0.216
Ownership of TMT and directors	0.084	0.015	0.082	0.017	0.083	0.017	0.084	0.016	0.083	0.016
CEO duality	-0.007	0.323	-0.007	0.330	-0.007	0.349	-0.007	0.302	-0.007	0.326
CEO change	-0.002	0.850	-0.002	0.854	-0.002	0.834	-0.002	0.828	-0.002	0.817
Constant	-0.024	0.828	-0.023	0.837	-0.024	0.826	-0.020	0.858	-0.021	0.850
Observations	4,496		4,496		4,496		4,496		4,496	
F-value	3.335	0.000	3.545	0.000	5.210	0.000	3.209	0.000	3.968	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.012		0.012		0.482		0.457

Appendix L. Supplementary analysis: Fixed effects regression firm-level analysis of change in ROA, controlling for the percentage change in total (U.S. dollar) firm CapEx investment

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.700	0.005	0.953	0.001	1.535	0.001	1.713	0.000
Extent of adjustments in resource allocation^2			-5.179	0.004	-7.567	0.000	-10.973	0.001	-12.724	0.000
Extent of adjustments X Environmental change					-1.949	0.016			-1.834	0.020
Extent of adjustments^2 X Environmental change					18.508	0.015			17.381	0.019
Extent of adjustments X Competitiveness							2.950	0.006	2.725	0.010
Extent of adjustments^2 X Competitiveness							-22.071	0.009	-20.037	0.016
Pace of environmental change			-0.004	0.064	0.032	0.038	-0.004	0.051	0.030	0.049
Industry competitiveness			0.043	0.071	0.046	0.052	0.006	0.812	0.012	0.656
Firm size	0.001	0.770	0.003	0.529	0.003	0.571	0.003	0.591	0.003	0.627
Financial leverage	0.055	0.074	0.058	0.060	0.059	0.058	0.056	0.071	0.057	0.068
Capital intensity ratio	-0.001	0.997	-0.056	0.777	-0.070	0.722	-0.070	0.728	-0.082	0.684
Percentage change in total firm CapEx investment	-0.011	0.431	-0.010	0.456	-0.010	0.475	-0.010	0.457	-0.010	0.474
Current ratio	0.002	0.713	0.001	0.823	0.001	0.835	0.000	0.927	0.000	0.928
Diversification	0.041	0.003	0.040	0.004	0.038	0.005	0.040	0.004	0.038	0.005
R&D intensity	0.608	0.021	0.600	0.023	0.607	0.020	0.581	0.025	0.590	0.022
ROA in t-1	-0.021	0.696	-0.021	0.701	-0.021	0.694	-0.019	0.728	-0.019	0.719
Industry munificence	-0.000	0.950	-0.003	0.317	-0.009	0.011	-0.004	0.275	-0.009	0.011
Board size	-0.001	0.709	-0.001	0.656	-0.001	0.630	-0.001	0.624	-0.001	0.603
Percentage of inside directors	0.060	0.028	0.055	0.038	0.056	0.038	0.051	0.050	0.052	0.048
Ownership TMT and directors	0.062	0.018	0.056	0.034	0.053	0.044	0.054	0.042	0.051	0.051
CEO duality	-0.007	0.187	-0.007	0.175	-0.007	0.190	-0.007	0.195	-0.006	0.209
CEO change	-0.010	0.188	-0.010	0.185	-0.009	0.193	-0.010	0.167	-0.010	0.175
Constant	-0.084	0.153	-0.087	0.134	-0.085	0.147	-0.088	0.127	-0.086	0.138
Observations	2,808		2,808		2,808		2,808		2,808	
Number of firms	354		354		354		354		354	
F-value	2.586	0.001	2.391	0.001	2.816	0.000	2.380	0.001	2.752	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.003		0.000		0.001		0.000

Appendix M. Supplementary analysis: Fixed effects regression firm-level analysis of change in ROA, controlling for the percentage point change in capital intensity ratio

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.668	0.009	0.926	0.001	1.515	0.002	1.697	0.001
Extent of adjustments in resource allocation^2			-5.159	0.006	-7.570	0.001	-11.064	0.001	-12.825	0.000
Extent of adjustments X Environmental change					-1.963	0.016			-1.844	0.020
Extent of adjustments^2 X Environmental change					18.623	0.015			17.452	0.019
Extent of adjustments X Competitiveness							3.003	0.006	2.775	0.010
Extent of adjustments^2 X Competitiveness							-22.542	0.009	-20.480	0.016
Pace of environmental change			-0.004	0.066	0.033	0.038	-0.004	0.054	0.030	0.049
Industry competitiveness			0.044	0.072	0.047	0.054	0.006	0.813	0.012	0.657
Firm size	0.000	0.929	0.002	0.657	0.002	0.697	0.002	0.730	0.002	0.762
Financial leverage	0.056	0.079	0.060	0.065	0.060	0.062	0.058	0.076	0.058	0.072
Capital intensity ratio	0.011	0.947	-0.044	0.793	-0.062	0.709	-0.055	0.745	-0.070	0.676
Percentage point change in capital intensity	-0.195	0.174	-0.177	0.203	-0.164	0.241	-0.182	0.189	-0.170	0.222
Current ratio	0.002	0.641	0.001	0.745	0.001	0.762	0.001	0.841	0.001	0.847
Diversification	0.040	0.003	0.039	0.004	0.037	0.006	0.039	0.004	0.037	0.005
R&D intensity	0.603	0.022	0.605	0.021	0.613	0.018	0.585	0.023	0.595	0.020
ROA in t-1	-0.022	0.689	-0.022	0.694	-0.022	0.688	-0.020	0.721	-0.020	0.713
Industry munificence	-0.000	0.919	-0.004	0.289	-0.010	0.009	-0.004	0.252	-0.009	0.009
Board size	-0.001	0.688	-0.001	0.645	-0.001	0.621	-0.001	0.614	-0.001	0.596
Percentage of inside directors	0.059	0.031	0.054	0.042	0.055	0.042	0.050	0.056	0.051	0.054
Ownership TMT and directors	0.062	0.016	0.056	0.029	0.054	0.038	0.054	0.036	0.051	0.045
CEO duality	-0.007	0.194	-0.007	0.179	-0.007	0.193	-0.007	0.199	-0.007	0.213
CEO change	-0.009	0.202	-0.009	0.198	-0.009	0.206	-0.010	0.179	-0.010	0.186
Constant	-0.078	0.199	-0.080	0.180	-0.078	0.195	-0.082	0.171	-0.080	0.183
Observations	2,808		2,808		2,808		2,808		2,808	
Number of firms	354		354		354		354		354	
F-value	2.690	0.001	2.373	0.001	2.798	0.000	2.326	0.001	2.732	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.005		0.001		0.001		0.000

Appendix N. Subsample analysis: Fixed effects regression firm-level analysis of change in ROA during years with no entry/exit

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Extent of adjustments in resource allocation			0.781	0.007	1.007	0.003	1.471	0.006	1.676	0.003
Extent of adjustments in resource allocation^2			-5.446	0.010	-7.434	0.006	-10.273	0.009	-12.065	0.005
Extent of adjustments X Environmental change					-1.581	0.176			-1.504	0.194
Extent of adjustments^2 X Environmental change					14.356	0.207			13.544	0.229
Extent of adjustments X Competitiveness							2.486	0.040	2.447	0.044
Extent of adjustments^2 X Competitiveness							-18.622	0.055	-18.252	0.060
Pace of environmental change			-0.003	0.161	0.028	0.191	-0.004	0.140	0.027	0.212
Industry competitiveness			0.032	0.221	0.033	0.216	0.003	0.919	0.004	0.894
Firm size	-0.004	0.456	-0.002	0.745	-0.002	0.723	-0.002	0.703	-0.002	0.679
Financial leverage	0.031	0.463	0.034	0.424	0.035	0.412	0.031	0.457	0.032	0.445
Capital intensity ratio	-0.104	0.398	-0.155	0.198	-0.162	0.175	-0.167	0.178	-0.173	0.160
Current ratio	0.002	0.709	0.001	0.824	0.001	0.861	0.000	0.919	0.000	0.952
Diversification	0.038	0.011	0.037	0.012	0.036	0.015	0.037	0.012	0.036	0.015
R&D intensity	0.475	0.123	0.430	0.164	0.432	0.161	0.419	0.174	0.421	0.171
ROA in t-1	-0.051	0.395	-0.049	0.412	-0.049	0.410	-0.048	0.419	-0.048	0.416
Industry munificence	-0.010	0.090	-0.011	0.110	-0.015	0.020	-0.011	0.106	-0.015	0.019
Board size	-0.002	0.516	-0.002	0.479	-0.002	0.484	-0.002	0.457	-0.002	0.464
Percentage of inside directors	0.024	0.385	0.018	0.497	0.020	0.469	0.015	0.586	0.016	0.548
Ownership TMT and directors	0.071	0.009	0.066	0.015	0.064	0.019	0.064	0.018	0.062	0.022
CEO duality	-0.003	0.650	-0.003	0.640	-0.003	0.648	-0.003	0.648	-0.003	0.659
CEO change	-0.008	0.325	-0.007	0.333	-0.008	0.321	-0.008	0.299	-0.008	0.286
Constant	-0.005	0.932	-0.013	0.808	-0.014	0.789	-0.014	0.796	-0.015	0.779
Observations	2,469		2,469		2,469		2,469		2,469	
Number of firms	344		344		344		344		344	
F-value	2.385	0.004	1.976	0.011	2.586	0.000	1.843	0.016	2.429	0.000
Lind-Mehlum test for presence of inverse U (*p-value*)				0.009		0.006		0.009		0.005

Appendix O. Supplementary analysis: Fixed effects firm-level regression of change in ROA, using a firm's resource allocation adjustment rhythm

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Resource allocation adjustment rhythm			-0.016	0.008	-0.017	0.005	-0.024	0.024	-0.024	0.022
Adjustment rhythm X Environmental change					0.004	0.600			0.004	0.623
Adjustment rhythm X Competitiveness							-0.024	0.376	-0.024	0.384
Pace of environmental change			-0.003	0.173	-0.009	0.439	-0.003	0.172	-0.009	0.460
Industry competitiveness			0.038	0.171	0.038	0.169	0.081	0.181	0.081	0.185
Firm size	0.001	0.889	-0.003	0.600	-0.003	0.591	-0.003	0.597	-0.003	0.589
Financial leverage	0.056	0.078	0.065	0.084	0.065	0.083	0.065	0.087	0.065	0.086
Capital intensity ratio	-0.102	0.362	-0.211	0.075	-0.213	0.075	-0.214	0.071	-0.215	0.071
Current ratio	0.002	0.708	0.000	0.920	0.000	0.916	0.000	0.938	0.000	0.934
Diversification	0.040	0.004	0.036	0.021	0.036	0.021	0.036	0.022	0.036	0.022
R&D intensity	0.695	0.009	1.071	0.000	1.068	0.000	1.074	0.000	1.071	0.000
ROA in t-1	-0.020	0.706	-0.035	0.563	-0.035	0.563	-0.035	0.560	-0.035	0.561
Industry munificence	-0.001	0.846	-0.009	0.177	-0.010	0.184	-0.009	0.177	-0.010	0.185
Board size	-0.001	0.677	-0.002	0.507	-0.002	0.516	-0.002	0.522	-0.002	0.531
Percentage of inside directors	0.062	0.026	0.069	0.028	0.070	0.027	0.070	0.026	0.070	0.025
Ownership TMT and directors	0.069	0.006	0.047	0.073	0.046	0.074	0.046	0.074	0.046	0.075
CEO duality	-0.007	0.181	-0.010	0.083	-0.010	0.090	-0.010	0.083	-0.010	0.090
CEO change	-0.009	0.224	-0.008	0.175	-0.008	0.174	-0.008	0.172	-0.008	0.171
Constant	-0.076	0.213	0.010	0.898	0.011	0.886	0.023	0.773	0.023	0.764
Observations	2,814		2,262		2,262		2,262		2,262	
Number of firms	354		286		286		286		286	
F-value	2.904	0.000	3.262	0.000	3.132	0.000	3.145	0.000	3.020	0.000