Determinants and Consequences of Budget Reallocations*

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ABSTRACT

We investigate the determinants and consequences of budget reallocations—that is, corrective changes to the budget made during the year. Using proprietary data from a large consumer goods manufacturer, we analyze the extent to which initial budgeting decisions drive reallocations. Examining this relationship is important because initial budget negotiations are often troubled by power struggles and politicking, which may give rise to the need for reallocations. We hypothesize that one important driver of reallocation decisions is the firm's aim to correct systematic deviations from the optimal initial budget that were driven by lobbying during the initial budgeting process. We find evidence that is consistent with this prediction. In a more exploratory analysis, we show that reallocations do not have the desired effects on market performance. In particular, budget cuts are negatively associated with a product's change in market share. More surprisingly, while budget increases do help product lines achieve their sales targets in the last quarter, they do not boost market share. Our results demonstrate that efficient investment planning is essential to achieve an improvement in market performance.

Keywords: budgeting, efficient budget allocation, budget reallocation, rent-seeking

Déterminants et conséquences des réaffectations de crédits budgétaires

RÉSUMÉ

Les auteurs s'intéressent aux déterminants et aux conséquences des réaffectations de crédits budgétaires — soit les rectifications apportées au budget en cours d'année. À l'aide de données exclusives à un grand manufacturier de produits de consommation, ils analysent la mesure dans laquelle les décisions initiales relatives à l'établissement du budget déterminent les réaffectations. L'étude de ce lien est importante, car les négociations budgétaires initiales sont souvent teintées par des luttes de pouvoir et des manigances, ce qui peut engendrer la nécessité de réaffectations ultérieures. Les auteurs posent l'hypothèse selon laquelle un important vecteur de décisions de réaffectation est la volonté de l'entreprise de redresser les écarts systématiques par rapport au budget initial optimal qu'a entraîné le lobbyisme pendant le processus initial d'établissement du budget. Les auteurs relèvent des données qui sont conformes à cette prédiction. Dans une analyse plus exploratoire, ils montrent que les réaffectations n'ont pas l'incidence espérée sur la performance de l'entreprise sur le marché. Les compressions budgétaires affichent notamment un lien négatif avec

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la variation de la part de marché d'un produit. Constatation plus étonnante, bien que les augmentations de crédits budgétaires contribuent bel et bien à l'atteinte des objectifs de vente des gammes de produits au dernier trimestre, elles n'élargissent pas la part de marché. Les résultats de l'étude montrent que la planification efficiente de l'investissement est essentielle à l'amélioration de la performance sur le marché.

Mots-clés : établissement du budget, affectation efficiente des crédits budgétaires, réaffectation des crédits budgétaires, recherche de profit

1. Introduction

In light of the increasing uncertainty in the environment and complexity of operations, it is not surprising that many companies allow for the reallocation of resources across entities during the budget period. After an initial budget allocation, they update their beliefs about the expected (relative) performance of the budgeted entities. Given the scarcity of resources, reallocations cannot be made in isolation. Changes to the budget of one entity typically require the allocations of others to be reconsidered as well.

When managers must decide whose budget to cut to free needed resources, they are confronted with a trade-off between increasing the opportunities for one entity and hampering those of another. In this study, we investigate the extent to which management takes the initial budget allocation into account when making reallocations. In particular, we examine whether decision makers use this opportunity to try to correct errors made in the initial allocation. While these errors can be caused by a number of factors, research shows that one important cause is internal power struggles and politicking (Rajan et al. 2000; Scharfstein and Stein 2000; Wulf 2009). In particular, systematic deviations from the optimal initial allocation (i.e., misallocations) have been shown to be partly due to rent-seeking by "weaker" entities; that is, those with lower productivity lobby for more resources than warranted (Meyer et al. 1992). This behavior often succeeds, as lower level managers can exploit their informational advantages over top management regarding performance expectations and growth opportunities of their entities. We argue that one important driver of reallocations is the firm's attempt to correct deviations from the optimal initial budget allocation that are driven by lobbying during initial budgeting. We expect that, in the presence of cross-subsidization of weaker entities by stronger ones during initial budgeting, initial misallocations influence the likelihood of budget cuts in an attempt to achieve a more efficient reallocation. Over the course of the budgeting period, some of the uncertainties of the initial budget allocation typically resolve. This increases the likelihood that management can identify rent-seekers, whose budgets we argue are then more likely to be cut if resources are needed elsewhere. Although the aim of reallocations is to increase the efficiency of capital investment, whether this materializes is an open question, which is why we also explore the performance consequences of budget reallocations.

Using the allocation of the marketing budget among product line managers and proprietary data from a large consumer goods manufacturer, we apply the allocation method developed by Fischer et al. (2011) to determine the optimal allocation (share) of marketing investments per product line as well as deviations from it (i.e., misallocations). A misallocation refers to the fraction of the budget share that is disproportionate to the product line's growth potential, sales elasticities, and the other characteristics accounted for in the allocation model.

Given that our theory regarding budget reallocations relies on (i) the presence of cross-subsidization in the initial budget allocation that is (ii) driven by rent-seeking, we first validate these facts in two ways. First, we show that (i) misallocations, with respect to the optimal allocation rule, indeed consist of systematic deviations consistent with cross-subsidization, rather than being random, and that (ii) this cross-subsidization cannot be explained by the alternative explanation of managers' cognitive bias for equal allocation (Bardolet et al. 2011). Second, given that rent-seeking implies that weaker entities are more likely to be over-allocated and unable to exploit this resource advantage, we hypothesize and show that, on average, budget over-allocation is negatively associated with the subsequent achievement of sales targets. Likewise, on average, the more under-allocated entities are, the worse they perform, as they increasingly lack the necessary resources needed to reach their customers. To further corroborate our theoretical assumptions, we develop a proxy for the productivity ("strength") of a product line, which captures the

expected effectiveness of additional marketing investments. This allows us to identify product lines with a higher likelihood of being rent-seekers ("weak") and those with a higher likelihood of being subsidizers ("strong"). We then show that the relation between over- and under-allocation and sales performance is significantly different for weak versus strong product lines in a way consistent with (only) weaker product lines engaging in rent-seeking.

In our main analysis, we find that—as hypothesized—deviations from the optimal initial budget share drive reallocations but that this effect is asymmetric, at least on average. While initially over-allocated entities are, on average, indeed more likely to be cut, entities that initially receive less than the optimal allocations are not more likely to subsequently receive extra resources. Subsequent analysis again shows significant differences between weak and strong product lines in a way consistent with reallocations being driven by corrections for rent-seeking. However, given the inability of companies and researchers alike to directly observe rent-seeking behavior, it is entirely possible that the cross-subsidization we observe in the initial budget allocation is also driven by additional factors other than rent-seeking. Consequently, additional considerations other than corrections for successful rent-seeking might also drive reallocation decisions. While we try to discount alternative explanations with a set of consistent empirical tests, we cannot rule out the possibility that other drivers of cross-subsidization might (partly) explain our results.

In a more exploratory analysis, we analyze the consequences of budget reallocations for market performance. We show that reallocations do not have the desired effects on performance, which suggests that managers plan on the basis of their initially allocated resources. Receiving more resources than expected does not make them use this money efficiently with respect to the external competition. In contrast, managers whose allocations are cut cannot stick to their plans, which leads to performance decreases.

Although budgeting is one of the most extensively studied topics in management accounting research, we contribute to this literature by providing insights into a so far unexplored part of the budgeting process, the determinants and consequences of reallocations during the year. Given the increasing uncertainty in the macro environment and complexity of firm operations, the initial budgeting process has become more difficult and more firms appear to allow some flexibility after initial budgets are set. Examples are the use of flexible and rolling budgets or forecasts to complement the annual budget (e.g., Merchant and van der Stede 2012). Usually, these tools aim to improve planning and coordination and ultimately the performance of budgeted entities by incorporating information that arrives after the annual budget is set. Importantly, the option to incorporate information that becomes available after the initial budget allocation affects the allocation of a fixed pool of resources, given that resources are scarce and changes in one entity rebound on others. This triggers two important, yet so far unexplored, questions. First, what drives reallocations? We contribute to the literature by showing that one important reason for reallocations is corrections of inefficiencies that occurred during initial budgeting. Most importantly, we show that reallocations are not just a reaction to the weaker entities' poor performance but rather to the initial over-allocations per se. This highlights the importance of taking a dynamic perspective to budgeting in general and gaming behavior in particular. Second, while allowing some flexibility after initial budgeting is aimed at improving performance, the question remains at to whether it does. We contribute to the literature by showing that reallocations cannot undo the harm of poor budgeting. Our results demonstrate that efficient investment planning is essential to improve performance, explaining the significant time and money that many firms devote to budgeting. These findings are consistent with the practitioners' view that the planning and coordination role of budgets might be even more important than their use for control purposes (Sivabalan et al. 2009).

2. Literature and hypotheses

The budget allocation process

The efficient and effective allocation of resources is one of the most important responsibilities of (top) managers to maximize firm value. An emerging stream of research on internal capital

markets has pointed to the difficulties of efficient intra-firm resource allocation as well as the determinants and consequences of misallocations (Rajan et al. 2000; Scharfstein and Stein 2000; Wulf 2009). In particular, this literature provides insights into the budget negotiations between a headquarters and its divisions and explains budget allocations among organizational entities. Several studies in corporate finance (e.g., Berger and Ofek 1995; Ozbas and Scharfstein 2010) have documented that multidivisional firms tend to cross-subsidize, that is, they spend "relatively too much in some divisions, and too little in others" (Scharfstein and Stein 2000, 2538). According to Scharfstein and Stein (2000), cross-subsidies are prone to be "socialist" in nature, because stronger entities end up subsidizing weaker ones. Therefore overinvestment in one division has the consequence of underinvestment in another more profitable division.

In this literature, a common explanation for the subsidization of underperforming entities is that these deviations from optimal allocation decisions result from managers engaging in rent-seeking; that is, they lobby the CEO for more resources, compensation, and power (Meyer et al. 1992). In line with the cross-subsidization argument, Scharfstein and Stein (2000) find that rent-seeking is mostly undertaken by managers of weaker divisions, as the opportunity costs of taking time away from productive work is lower for them. Receiving more resources than warranted helps them achieve their targets, that is, target difficulty decreases.

Rent-seeking often succeeds. Lower level managers have an informational advantage over top management regarding their divisions' operating environment and can better assess—and deliberately overstate—performance expectations and growth opportunities. Thus top management lacks both private information on the expected value of the proposed investments as well as the resources required to carefully audit every request for funds, which is why rent-seeking during initial budgeting is difficult to detect (Bardolet et al. 2011, 1466).

While some of these uncertainties will resolve over time, the informational advantage of division managers is likely to persist. This implies that rent-seeking remains difficult to detect and the possibility that rent-seekers will not be identified and thus evade potential punishment either in the current period via a budget cut or via a lower future budget exists.[1]

Besides the possibility that cross-subsidization is driven by rent-seeking, such systematic deviations might also be caused by other factors. For example, Bardolet et al. (2011) propose that cross-subsidization can be observed even in the absence of any agency conflicts. In particular, they argue that managers have a cognitive, though not necessarily conscious, bias toward an even resource allocation, implying that benefits and costs are allocated relatively evenly among divisions, irrespective of their investment opportunities. Consistent with this prediction, they show that the number of divisions and the relative size of the division within the firm relate to budget allocations, after controlling for measures of the divisions' expected productivity. They conclude that cross-subsidization might not only be the result of stronger entities subsidizing weaker ones, because of rent-seeking, but more generally the result of subsidization of smaller divisions by larger ones. Finally, while cross-subsidization in general reflects a systematic deviation from optimal allocations, it is highly likely that there will also be random errors in initial allocation decisions, due to the inherent uncertainty about investment opportunities (Wulf 2009).

The marketing budget

One category of expenses that must be planned annually is marketing spending. These expenses include, among others, advertising or media, sales promotions, and physical distribution (Schwartz 2012). This "marketing portion of the budget considers what resources are to be used, and in what mix, to move products from the firm to its customers" (Schwartz 2012, 381). The ultimate impact of marketing expenditures on firm performance is hard to predict and difficult to

1. For example, while management can identify that a division manager has not met performance expectations, it is often not clear why. For example, it could be due to the weakness of the division per se or due to bad luck or other external factors. Given that weak entities will try to disguise their weakness (e.g., finding excuses for their shortcomings), management cannot perfectly identify rent-seeking.

evaluate (Schwartz 2012). Thus, research in marketing suggests that the marketing budgeting is characterized by social interaction and negotiation (Piercy 1987). Accordingly, the organizational politicking involved in marketing budgeting is argued "to act as just the type of internal capital market that organizational theorists have associated with the multidivisional form" of an organization (Piercy 1987, 56). Relatedly, previous research on marketing budget decisions shows that the level of investment does not matter as much as *how* money is invested (e.g., Tull et al. 1986; Mantrala et al. 1992; Fischer et al. 2011).

While the accounting and finance literature has dealt at great length with the (capital) budgeting process in general, marketing researchers have specifically addressed the allocation process of the marketing budget, and identified its distinctive features. Combining the insights of these literature streams, we develop hypotheses regarding the determinants of (re)allocations of the marketing budget.

Hypotheses

Misallocation and rent-seeking of weaker divisions

As discussed above, research has shown that the initial budget allocation is likely to be distorted, in the sense that stronger entities cross-subsidize weaker ones. In addition to managers' potential bias for equal allocation (Bardolet et al. 2011), we argue that misallocations due to cross-subsidization are also driven by rent-seeking by weaker entities. Given the discretionary nature of the marketing budget, politicking can be expected to be a natural part of annual budgeting, because managers are given a lot of opportunity to influence the initial allocation and they can then exploit their informational advantages (Piercy 1987; Bernardo et al. 2004). This implies that, as the result of the initial allocation, stronger entities are likely to be allocated, on average, a smaller share of the budget than would be optimal, while weaker ones will receive more than warranted.

This observation has important implications for the entities' performance during the year. Cross-subsidized entities, that is, over-allocated entities, are more likely to be less productive (weaker) types and therefore more likely to perform poorly. In particular, under the assumption that sales plans do not systematically take the relative strength of entities into account, over-allocated entities are less likely to achieve their plans, even with relatively more resources, because they cannot exploit their resource advantage.[2] Therefore, a negative association between a current over-allocation and future sales performance compared to plans is consistent with misallocations being driven by cross-subsidization, due to rent-seeking, rather than by random errors due to uncertainty. Given this expectation, we also expect that over-allocation is associated with subsequent lower sales performance, as compared to plans.

HYPOTHESIS 1a (H1a). *Over-allocation, relative to the optimal initial budget share, is negatively associated with subsequent sales performance as compared to plans.*

Under the same assumption that sales plans do not systematically take the strength of entities into account, the effect of under-allocation on subsequent sales performance is not as straightforward. On the one hand, it can be argued that under-allocated entities are on average more productive and more successful and therefore able to outperform their plans, even with

2. This assumption holds in our empirical setting. Specifically, sales plans are set by headquarters prior to the allocation of the marketing budget, without the involvement of the managers of the "entities," and the plans are mostly driven by corporate political pressure—as is typical for firms that face extensive pressures to meet or beat communicated corporate targets (Feichter et al. 2018). All these factors suggest that the plans do not take into account the weakness or strength of the entities but rather are anchored on some common corporate target. As a result, all else equal, sales plans are "too difficult" for weak entities and "too easy" for strong ones. We elaborate more on the process of setting sales plans when we describe the empirical setting as well as in our conclusion.

fewer resources. However, one can also argue that they cannot outperform their plans because the under-allocation is too severe and they lack the necessary resources. Which effect dominates is an empirical question, and therefore we state the hypothesis in the non-directional form.

HYPOTHESIS 1b (H1b). *Under-allocation, relative to the optimal initial budget share, is associated with subsequent sales performance as compared to plans.*

Determinants of reallocation decisions

In response to increasing uncertainty with respect to competition and customer demands, more and more companies allow top management to reallocate resources, as they update their beliefs about relative expected performance. In other words, new information on the entities' sales and profits throughout the year can trigger the need for remedies to optimize the bottom line. However, reacting to a contingency in one entity typically requires changes in another given that reallocations involve at least two parties. Therefore, reallocation expands to the decision of whose budgets will need to be cut. We expect that in making this difficult decision management will take the initial budget allocation into account. During initial budgeting, many decisions must be made with incomplete information, due to resource constraints and time pressure (Bernardo et al. 2004), which leads to misallocations caused by, among other factors, rent-seeking. At the outset, management lacks both private information on the expected value of the proposed investments as well as the resources to carefully audit every request for funds (Bardolet et al. 2011, 1466). However, we expect that over time some of the uncertainties regarding investment opportunities resolve, either through observations of realized performance or acquisition of better information on expected market developments.[3] Thus, in reallocation decisions, management will attempt to take resources away from managers that have been identified to have overstated their investment prospects.

One important reason why a potential correction is likely is that the reallocation process differs substantially from initial budgeting. Reallocations are typically triggered by external events that require an immediate response. Examples of such events are the unexpected disappearance of a competitor or an unexpected change in customer preferences. Thus, the response needs to be improvised and the decision whether to reallocate is usually urgent, which limits the number of lower level managers (i.e., potential rent-seekers) who will be involved.[4] Thus, in contrast to initial budgeting, which is characterized by ongoing negotiations between a large number of self-interested participants (e.g., Hansen et al. 2003; Libby and Lindsay 2010), reallocations are likely to be executed within a much smaller scope, partly because of resource constraints. In sum, when management reallocates resources to exploit arising opportunities and to react to changes in the marketplace, the organizational politicking will be less pronounced. Consequently, we expect that the decision on which divisions' budgets to cut to free needed resources is less likely to be affected by lobbying, which makes budget cuts of weaker entities (typically the rent-seekers) more likely. In particular, we expect that those entities that received more than optimal resources during the initial allocation are more likely to have their budgets cut during reallocation in an attempt to correct initial distortions. Given the inherent difficulty of detecting rent-seeking even ex post, we do not expect

3. For example, a manager might have (deliberately) drawn a too pessimistic picture regarding changes in the preferences of the target customer group to justify extra marketing efforts, but the pessimistic reality never materialized.
4. For example, reallocation decisions at our research site are made by the management committee together with the controlling department. Product line managers who are in charge of the budgets to be potentially cut are typically not involved. Further, our discussion with an industry expert also confirms that reallocation decisions are typically made ad hoc by upper-level management, given their urgency. See also section 3.

that management will identify every instance. However, we do expect that, in determining budget cuts, managers will prioritize those entities they have identified as potential rent-seekers. Following the same logic, we predict that under-allocated entities that received less budget than they should have are less likely to be cut.[5] Stated formally:

HYPOTHESIS 2a (H2a). *Over-allocation, relative to the optimal initial budget share, increases the likelihood of subsequent budget cuts.*

HYPOTHESIS 2b (H2b). *Under-allocation, relative to the optimal initial budget share, decreases the likelihood of subsequent budget cuts.*

The purpose of reallocations is to increase the efficiency of invested capital, ultimately increasing overall firm performance. If reallocations do indeed correct, at least partly, initial misallocations, positive performance effects can be expected, particularly for the entities that receive additional capital. However, the initial misallocations presumably harm performance (Scharfstein and Stein 2000; Wulf 2009) and it is not clear to what extent subsequent corrections can mitigate this. Therefore, it is an empirical question whether, and in which direction, budget reallocations impact the affected entities' performance. To explore the performance consequences of budget reallocations, we state the following nondirectional hypothesis.

HYPOTHESIS 3 (H3). *Budget reallocation is associated with subsequent performance.*

3. The research site: ConsumerCo

We conduct a field study with ConsumerCo, one of the divisions of a multinational corporation, which we refer to as MotherCo, operating in the fast-moving consumer goods industry.[6] With its approximately 30 product lines, ConsumerCo is among the largest divisions of MotherCo. The consumer goods industry is characterized by the substitutability of its products. Therefore, it is a marketing-driven industry, making market and media presence a top priority. ConsumerCo spends about 50% of yearly net sales on marketing to maintain or increase the market share of its product lines and to keep pace with fierce competition. Consequently, the market share of each division is an important measurement tool for overall firm performance, compared to competitors. Not surprisingly, marketing is the largest yearly expenditure of ConsumerCo and has a marked effect on the bottom line. The marketing budget is also used as a performance monitoring tool for the division. Frequent evaluations of budgeted versus actual expenses are performed, and budget reallocations are executed when necessary.[7]

The budgeting process

Figure 1 illustrates the initial budgeting process (panel A) as well as the marketing budget reallocation process (panel B).

5. To be complete, the same reasoning applies when money becomes available. That is, initially under-allocated entities will be assigned more of the surplus capital. This scenario is, however, less likely, given that we expect that the trigger for reallocations is capital demand, rather than capital surplus.
6. The information presented in this section is based on discussions with the managing director, the head of controlling, and business controllers of ConsumerCo as well as secondary documents received from ConsumerCo.
7. A discussion with a consumer goods industry expert at one of the largest global media agencies worldwide confirmed that the marketing budgeting at our research site represents the state-of-the art in the consumer goods industry, rather than being an exception.

Figure 1 Budget process

Panel A: Initial budgeting process

Steps in the Budgeting Process

SALES TARGETS

① Sales targets are set top down by headquarters based on corporate objectives and communicated to divisions and product lines (no involvement of product line managers and little involvement of division management)

MARKETING BUDGET

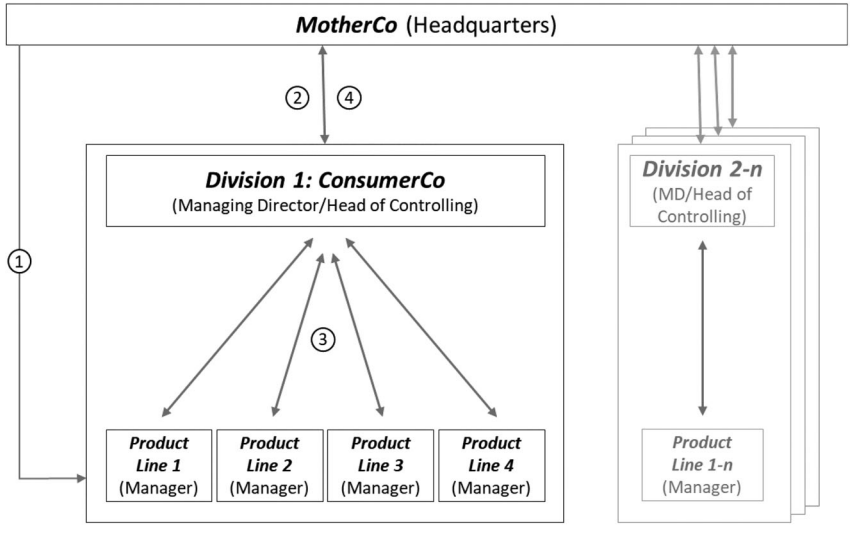
Based on sales targets, the marketing budget is determined by an iterative process between headquarters, division management, and product line managers

② Level of marketing budget for the division (size of the pie) is negotiated between HQ and division management

FOCUS OF OUR STUDY

③ Allocation of budget is negotiated between division management and product line managers (no involvement of HQ). Based on input during STEP 3, renegotiations of STEP 2 could take place

④ Final approval of marketing budget by HQ



(The figure is continued on the next page.)

Figure 1 (continued)

Panel B: Budget reallocation process

Steps in the Reallocation Process

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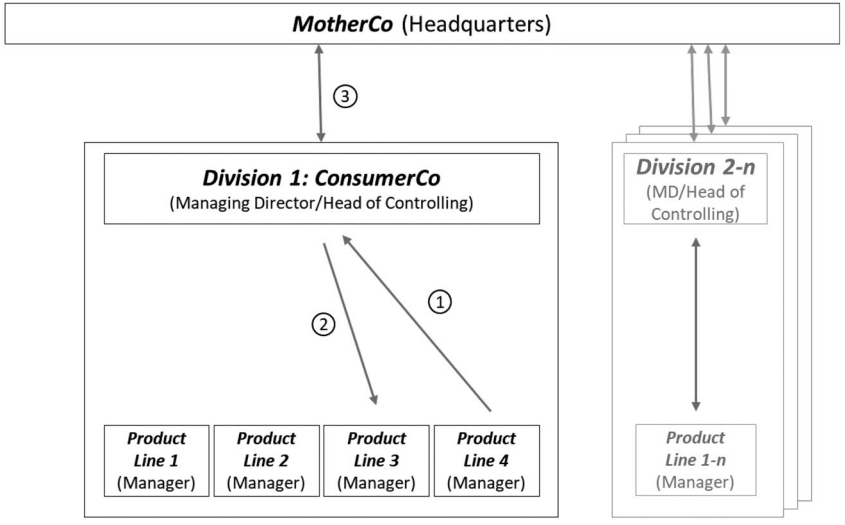
① **Communication of reallocation need**
- Mostly triggered by unexpected developments in the market, that is, the product line manager reports need for more resources (more likely a bottom-up process)

② **Determination of reallocations**
- Based on performance monitoring by division management and resolution of uncertainty, i.e., more information regarding true potential than during initial budget process is available, identification of one or more product lines to be cut (more likely top-down process)
- Unlike during the negotiations in the initial budget allocation (STEP 3 in Figure 1 Panel A), not all product line managers are involved in the reallocation discussions for specific product lines!
- The outcome of STEP 1 and STEP 2 are the reallocation decisions for each involved product line (for example, a budget boost for Product Line 4 and budget cut for Product Line 3)

③ **Final approval of changes to division marketing budget by Headquarters**
- Purely a formality



The initial marketing budget is determined in the course of the annual sales budgeting process of MotherCo, in which sales and profit plans as well as the corresponding marketing budgets are set.[8] Budgeting begins at least three months before the start of the next fiscal year. In the first step, sales and profit plans are set in a top-down process from headquarters. MotherCo first sets top-line sales and profit plans at the corporate level, which are then broken down to division sales and profit plans and further broken down to the individual product lines, which is our unit of analysis. According to our discussions, division management of ConsumerCo has very little influence on its final sales and profit plans. As the head of controlling stated, "We can make recommendations and are involved in the discussions, but, in the end, the political pressure (from headquarters) will set the targets." Product line managers are not at all involved in the sales and profit planning process.

Once the sales and profit plans are set, MotherCo communicates the annual sales plans. Based on these plans, the divisional marketing budget is then developed via iterations between headquarters and the division. The level of the marketing budget for the division, that is, the *size of the pie*, is negotiated between headquarters and division management. Based on input gathered from product line managers, the division's controlling department, in cooperation with the managing director of the division, develops an initial suggestion for the marketing budget, which is then negotiated with headquarters. Once the level of the overall marketing budget for the division has been determined, the individual marketing budgets per product line, that is, the *allocation of the pie*, is negotiated between division management and product line managers. MotherCo does not participate in the budget allocations to the different product lines within a division. Based on input from product line managers during this latter step, renegotiations between headquarters and division management regarding the size of the pie can occur. Once this process is finalized, the final marketing budget is then proposed to headquarters for approval.

After approval from MotherCo, the spending level per product line is normally fixed. Nevertheless, the managing director of ConsumerCo, together with the controlling department, can request shifts between the budgets of the different product lines (i.e., reallocations) during the year. Although such changes do not affect the level of the divisional marketing budget, they still need to be approved by MotherCo, which, as our discussions confirm, is a formality. Reallocations not only enable the exploitation of arising opportunities and responses to changes in the marketplace but also help optimize the division's bottom line. Note that the sales plan is used as a performance monitoring tool for the division, and the division's controlling department plays an important role in this process. The business controllers perform frequent, sometimes even weekly, evaluations of product line performance, that is, they closely monitor the firm's three most important key performance indicators—market share, net sales, and product line profit—as well as track budgeted versus actual marketing expenses.

Performance evaluation and incentives

The management committee of ConsumerCo has explicit incentive contracts based on sales target achievement at the aggregate division level. While there are no explicit performance targets linked to the achievement of the profit targets, these are considered in the overall evaluation of the management committee's performance. This implies that members of the division's management committee have incentives to ensure an efficient budget allocation and reallocation to maximize the division's (sales) performance and, in turn, their own compensation. Product line managers do not have explicit incentives based on the achievement of the sales plans for their respective product lines. However, this is an important component of the evaluation of the product line manager's performance at year-end and one of the most important factors in promotion decisions.

Field evidence regarding rent-seeking and its role in reallocations

Given the difficulty of capturing rent-seeking, we provide qualitative evidence to supplement our quantitative analyses and corroborate our theory. Our discussions confirm that product line managers indeed

8. While the market share at all different levels of aggregation is considered the most important performance indicator (KPI), no explicit targets are set, as these are implicitly captured by the sales plans.

have incentives to rent-seek. They, in effect, have no influence on their sales targets, so the only way to make targets easier is to obtain a greater allocation of marketing resources. Thus they have incentives to lobby for excess resources, especially when sales targets are more difficult because they are weaker entities. It is also worth mentioning that a product line's bottom line is typically not considered in performance evaluations and promotion decisions, which implies that product line managers are not bearing the consequences of higher marketing budgets being allocated to them.

Our discussions describe budget reallocation as a balancing act between the product line portfolio's market share, net sales, and profit performance. To achieve balance across product lines, the initial budget allocation is updated. Our discussions additionally reveal that the most important trigger for budget increases is the response to *unexpected* competitor activities, as these most directly influence market share. Information about these activities is not initially available, and adjustments to the budget therefore happen over the course of the business year, with an aim of keeping up with competitors.

Regarding decisions on which budgets to cut to free needed resources, the first thing that the management committee considers is changes to a product line's profitability, which are best reflected in changes in the ratio of sales-to-date performance to marketing costs. Thus, if profitability drops, the marketing budget is shifted away from the underperforming product lines to safeguard the targeted bottom line. Our discussions also confirm that the initial budget allocation is indeed factored into the decision of which budgets to cut. In particular, product lines that, in hindsight, received "too much" budget will be cut to restore the balance described above. When asked to describe how "too much" is defined, two things were mentioned: (i) too much as compared to realized sales-to-date performance and (ii) too much as compared to the realization of *expected* external forces such as *expected* competitor actions or changes to customer preferences, both of which are in line with our expectations underlying H2a and H2b.

While product line managers are heavily involved in the initial budget allocation, reallocation decisions are typically made by the management committee, in cooperation with the controlling department. Most importantly, while product line managers might approach the management committee for extra resources, once new information about competitor activities arrives, product line managers are typically not involved in the decisions on which budgets to cut to free resources. Thus it is safe to say that reallocation is much less affected by politicking than initial budgeting, consistent with the premise of H2a and H2b.

Sample, data, and measures

The data cover the period from 2007 to 2010, resulting in 122 product line–year observations for the four years. For each product line, we gathered budget as well as actual data for the following variables: net sales (less returns), contribution margin, and total marketing expenditures. Moreover, we received actual data on market shares and quarterly net sales at the product line level for the period of 2006 until 2010. Further, the marketing director rated the degree of competition per product line, resulting in an indicator variable for high versus low competition. We also collected data on launches within a product line or launches of entirely new product lines occurring during each year. Based on historical sales growth and a subjective classification by the marketing director with respect to each product line's stage in the product life cycle, we classify each product as being either in the growth or maturity stage.

4. Empirical design

Marketing budget allocation: The near-optimal allocation rule

To determine the optimal share of the marketing budget per product line, we rely on the allocation method developed by Fischer et al. (2011), which optimally allocates a fixed marketing budget among a diverse product portfolio. The optimal allocation rule maximizes the discounted total profits of the portfolio. More importantly, Fischer et al. (2011) develop a near-optimal allocation rule that is easy to implement and, as they show using a simulation, converges to the optimal solution under varying conditions.

Given that their context of a fixed marketing budget and a diverse product portfolio fits with our setting, we follow their approach to determine the near-optimal shares of the marketing budget. The allocation rule incorporates information about (i) the size of the product line, (ii) the contribution margin, (iii) the (long-term) effectiveness of marketing investments, (iv) the growth potential, and (v) the time value of money.[9] A full description of the allocation rule, its assumptions, and its application to our setting are reported in the online Appendix.[10]

Measures of budget misallocation and reallocation

We use the near-optimal share of the marketing budget to develop variables associated with the over- or under-allocation of the initial marketing budget induced by other factors not included in, and consequently not explained by, the economic optimal solution. Specifically, we use the difference between the budgeted share of total marketing expenditure of product line i of product-category k at time t and the near-optimal share of product line i of product-category k at time t as a proxy for the misallocated marketing budget at the product line level in a given year ($MISALLOCATION_{ikt}$). Second, we separate the over-allocation of marketing expenditures from the under-allocation by creating two variables based on $MISALLOCATION_{ikt}$. $\%OVERALLOCATION_{ikt}$ ($\%UNDERALLOCATION_{ikt}$) equals $MISALLOCATION_{ikt}$ ($-1 \times MISALLOCATION_{ikt}$) if $MISALLOCATION_{ikt}$ is positive (negative) and zero otherwise.

Furthermore, during the business year, new information on profitability and growth opportunities of the product lines may arise. As a consequence, reallocations in the budget and therefore marketing investment may occur. While $MISALLOCATION_{ikt}$ represents the impact of factors other than those included in the near-optimal solution on ex ante budget allocation decisions, $\%REALLOCATION_{ikt}$ reflects changes to the share of marketing expenditures ex post. Consistent with the variables for ex ante misallocation, we measure $\%REALLOCATION_{ikt}$ as the difference between the *actual* share of marketing expenditures at year-end and the initial *budgeted* share of marketing expenditures received. We further define $IND\_SHARECUT_{ikt}$ as an indicator variable set equal to one for observations for which $\%REALLOCATION_{ikt}$ is negative, indicating a budget share cut.

5. Results

Descriptives

The descriptive statistics, presented in Table 1, show the following noteworthy results. The budgeted share of the marketing budget (*BUDGETSHARE*) that a product line on average receives is 3.25%, while the maximum share is less than 20%, which indicates that there is not a single product line that dominates the budget. A similar pattern is observed for the near-optimal share, with an average of 3.28% and a maximum of less than 26%. Furthermore, 38.52% of the product line–year observations contain over-allocations, which indicates that, although under-allocations are more likely, over-allocations are larger when they occur.[11] The reallocations during the year (*%REALLOCATION*)

9. The extent to which the near-optimal allocation rule correctly captures the optimal budget shares crucially depends on whether the input factors (parameters) are correct. Of particular importance for our empirical analysis is that the parameters we need to estimate, are unbiased estimates of the parameters that are available to the firm when they plan the marketing investments. Supporting Information in the Online Appendix provides a detailed explanation and substantiation of our estimated parameters. Some of the parameters do not have to be estimated because they come directly from the firm's information system and these are thus free from measurement error by the researcher. It is of course possible that this information itself is not fully correct. For example, contribution margins, which were provided to us, can be influenced by discretionary variable cost allocations. If these allocations do not correctly capture the underlying process, the near-optimal allocation rule also does not correctly capture the "real" optimal budget shares. Even though this type of measurement error is possible, it neither affects our empirical analysis nor our inferences. As stated before, what is important for our study is that the parameters we use, reflect the parameters that are available to the firm when they plan the marketing investments, which is by definition the case for the parameters that were provided by the firm.
10. Please see supporting information, as an addition to the online article.
11. This conclusion follows from the fact that the misallocations sum up to zero and are thus on average zero.

TABLE 1
Descriptive statistics

	n	Mean	SD	Min.	Max.
BUDGETSHARE	122	0.0325	0.0467	0	0.1993
OPTIMALSHARE	122	0.0328	0.0489	0	0.2572
IND_OVERALLOCATION	122	0.3852	0.4887	0	1
%OVERALLOCATION	122	0.0075	0.0145	0	0.0638
%UNDERALLOCATION	122	0.0078	0.0165	0	0.0802
IND_SHARECUT	122	0.4098	0.4938	0	1
%REALLOCATION	122	0.0003	0.0090	−0.0231	0.0522
NPL	122	30	3	26	34
SHARE_EQUAL	122	0.0340	0.0033	0.0294	0.0385
SHARE_SIZE	122	0.0328	0.0461	0	0.2081
NEWPL	122	0.0738	0.2625	0	1
LCYCLE	122	0.1885	0.3927	0	1
B_CM%	122	0.4687	0.2478	0	0.7410
CH_CM%	122	0.0908	0.2303	−0.2344	0.8976
COMP	122	0.6721	0.4714	0	1
LMSHARE	122	0.0422	0.0681	0	0.2511
LAUNCH	122	0.4016	0.4923	0	1
Q1_PERF_YTD	122	0.2468	0.9151	−1	5.7110
Q2_PERF_YTD	122	0.2089	0.8145	−1	4.9302
Q3_PERF_YTD	122	0.1617	0.7587	−1	4.9744
Q4_PERF_YTD	122	0.0994	0.7549	−1	4.6781
CH_MSHARE	122	0.0009	0.0095	−0.0361	0.0651
Q4_SALESPERF	122	−0.0493	0.9473	−5.296	4.824
%SHAREBOOST	122	0.0028	0.0065	0	0.0522
%SHARECUT	122	0.0025	0.0049	0	0.0231
%LEVELBOOST	122	0.4512	0.7321	0	3.5087
%LEVELCUT	122	0.0989	0.2062	0	−1
TV	122	0.4936	0.5018	0	1

Notes: See the Appendix for variable definitions.

range from a share cut of 2.31% to a share boost of 5.22%, which is significant given the average share of the marketing budget allocated to product lines. Moreover, none of the correlations between the independent variables used in our analysis (untabulated) cause multicollinearity concerns.

Initial analysis of misallocations

In section 2, we provided a number of reasons for why the share of the marketing budget allocated to a product line might deviate from the optimum. There could be random error due to information asymmetry, cognitive bias in favor of naïve diversification, or rent-seeking. Or there could be a combination of these factors. First, we examine whether naïve diversification drives budget allocation decisions in our setting. An allocation based on naïve diversification implies a cognitive bias toward spreading resources over all product lines more evenly than would be dictated by the optimal allocation of resources—specifically, a bias toward an allocation that equals $1/n$, with n being the number of product lines (Bardolet et al. 2011). Under the assumption that an unbiased allocation should take the relative size of a product line into account in the allocation decision (Bardolet et al. 2011), in the sense that larger lines should get a larger share, a bias toward an allocation that equals $1/n$ automatically implies that larger lines are at a disadvantage. As a result, if an allocation based on naïve diversification is at play, then the allocation is positively related to $1/n$ and, *conditional on this*, negatively related to the relative size of the product line. We closely follow Bardolet et al. (2011) and estimate

TABLE 2
Pattern of budget misallocation

Panel A: Test whether budget allocation is driven by naïve diversification (cf. Bardolet et al. 2011)

Variable	Pred. sign	*BUDGETSHARE*	*BUDGETSHARE*
Intercept		−0.013	0.008
		[0.014]	[0.021]
OPTIMALSHARE		0.878***	0.664***
		[0.098]	[0.119]
SHARE_EQUAL	(+)	0.387	0.347
		[0.410]	[0.417]
SHARE_SIZE	(−)		0.286*
			[0.166]
Product-category fixed effects		Yes	Yes
Adjusted R^2		0.866	0.878
n		122	122

Panel B: Average misallocation for different levels of productivity (with 5 being the highest level)

	CAT_ PRODUCTIVITY				
	1	2	3	4	5[a]
MISALLOCATION	0.14%	0.33%	0.56%	0.02%	−1.19%

Notes: Indicated *p*-values are one-tailed for coefficients with predicted signs (i.e., "(+)" or "(−)") in case the estimated sign is consistent with the predicted sign and two-tailed otherwise. Standard errors in brackets are adjusted for clustering within product lines over time. See the Appendix for variable definitions. [a]Only category 5 is significantly different from all other categories ($p < 0.10$ two-tailed or better). * and *** represent significance levels of 0.10 and 0.01, respectively.

model (1) to test whether naïve diversification is driving the allocation of the marketing budget in our setting (see the online Appendix for a formal derivation of this equation).

$$BUDGETSHARE = \beta_0 + \beta_1 OPTIMALSHARE + \beta_2 SHARE\_EQUAL + \beta_3 SHARE\_SIZE + \mu, \quad (1)$$

where *OPTIMALSHARE* is the near-optimal share, *SHARE_EQUAL* is $1/n$, and *SHARE_SIZE* is the product line's sales in year $t-1$ divided by the sum of all product lines' sales in year $t-1$. For naïve diversification to be present, a necessary condition is that $\beta_2 > 0$. If the relative size argument *also* holds, then the additional condition is that $\beta_3 < 0$.

Panel A of Table 2 presents the results of estimating model (1), both without including the relative size of the product line and including it. We find that, while the near-optimal share (*OPTIMALSHARE*) is positive and significant in both regressions, as expected, the variable *SHARE_EQUAL* is not significant in both regressions. We thus fail to find evidence in favor of the *necessary* condition for the presence of naïve diversification. In addition, the coefficient on *SHARE_SIZE* is positive and significant, which is contrary to the expectation of naïve diversification via relative size.[12] In sum, we find no evidence that the allocation of the marketing budget is being driven by naïve diversification, which allows us to rule out that the results of our upcoming analyses are so driven.

12. The positive coefficient can be explained by the observation that lagged actual sales correlate with currently planned sales, with the latter being part of the near-optimal allocation rule, that is, *OPTIMALSHARE*. The small drop in the coefficient on *OPTIMALSHARE* is consistent with this interpretation, and, more importantly, this interpretation comports with naïve diversification not playing a role in our setting.

Ruling out naïve diversification does not, however, imply that rent-seeking is at play. To provide initial evidence for the presence of rent-seeking, we focus on the rent-seeking prediction that cross-subsidization relates systematically to "productivity." In particular, theory predicts that rent-seeking occurs for weak product lines, that is, those with productivity below some threshold, leading to an over-allocation, while product lines above the threshold ("strong") are used to cross-subsidize and are thus under-allocated. We therefore examine how misallocations are distributed over different levels of productivity. To create these subgroups of productivity, we exploit the fact that the theory of optimal allocation predicts that, all else equal, more productive product lines should be allocated a greater share of the resources. For example, all else equal, product lines with greater marketing effectiveness should receive a greater share. Similarly, all else equal, product lines with greater growth potential should receive a greater share. Given that all these productivity components monotonically increase the near-optimal share, it follows that subgroups based on our measure of the near-optimal share by construction overlap with subgroups based on (unobserved) productivity.[13] As a result, we split the near-optimal share in quintiles and examine the average misallocation of each quintile. First, the results presented in panel B of Table 2 show that misallocations increase from the first to the third quintile and drop after that. Second, the average misallocation is positive in quintiles 1–4 and negative in quintile 5, which implies that there is on average an over-allocation in quintiles 1–4 and an under-allocation in quintile 5. Third, the over-allocation is marginally significantly different from zero in quintiles 2 and 3 ($p = 0.11$ and $p = 0.02$ two-tailed, respectively), while the under-allocation in quintile 5 is not significantly different from zero ($p = 0.19$ two-tailed). Finally, while the average misallocation is not significantly different among the first four quintiles, all four differ significantly from quintile 5 ($p < 0.10$ two-tailed or better).

Overall, these results show that the pattern of misallocations is not random. More importantly, while the pattern does not provide evidence of rent-seeking per se, it is consistent with the rent-seeking prediction that misallocations are a function of productivity. The highest quintile is clearly distinct from the rest and, if the rent-seeking story holds, most likely represents the absence of rent-seeking, that is, product lines that are used for cross-subsidization. We use this observation to create an indicator variable for "high productivity," which allows for more specific tests of our rent-seeking hypotheses.

Misallocation and rent-seeking of weaker divisions (H1a and H1b)

H1 predicts that budget misallocations regarding the initial budget are associated with subsequent year-to-date performance. We test H1 with the following OLS models.

$$DV_{ikt} = \beta_0 + \beta_1 \%OVERALLOCATION_{ikt} + \beta_2 \%UNDERALLOCATION_{ikt} + \sum_{j=1}^{m} \gamma_j X_{ikt} + \nu_{ikt}, \quad (2)$$

where the dependent variable is *Q1_PERF_YTD*, *Q2_PERF_YTD*, or *Q3_PERF_YTD*, representing year-to-date performance regarding sales after each of the first three quarters.[14] That is, for each quarter, we compare the sales to date to the sales plan to date, and measure percentage differences.[15] Consistent with H1a, we argue that, on average, over-allocations are negatively

13. See the online Appendix for a formal derivation.
14. The timing of the measurement of year-to-date performance is based on discussions with the head of controlling, indicating that most reallocations happen in the second half of the year and preferably, at the latest, after the third quarter to allow the reallocations an opportunity to affect performance in the current year. Therefore only the first three quarters allow for a clean test of H1.
15. In measuring sales plan to date, we create quarterly sales plans by dividing the annual sales plan equally over the year. The equal divide seems reasonable in our empirical setting, and an additional seasonality test confirms this.

associated with year-to-date performance ($\beta_1 < 0$), while per H1b we have a nondirectional prediction for under-allocations (β_2). In all models, we control for the product line's stage in the product life cycle (*LCYCLE*), with the variable equaling one when a product line is in the growth stage and zero when it is in the maturity stage. We add another indicator variable accounting for the impact of a launch within a product line. *LAUNCH* equals one in the case of at least one launch in the product line at time *t* and zero otherwise. Similarly, a launch may not only represent one new product added to a product line but the launch of a whole new line. To account for this, we include an indicator variable for the launch of a new product line: *NEWPL* equals one if a new line is launched in a product category and zero otherwise. We further control for the natural log of the lagged market share of the product line (*LMSHARE*) and the degree of competition in the market for the product line, where *COMP* equals one if the degree of competition in the product line's market is high and zero otherwise. Finally, we include *B_CM%*, which is the budgeted contribution margin percentage of the product line. We also include year and product-category fixed effects and cluster the standard errors by product line.

The results are reported in Table 3. Consistent with our expectation, we find evidence that initially over-allocated products are less likely to achieve their sales plans. In particular, β_1 is negative and significant in all models, providing evidence in favor of H1a. Most importantly, initially over-allocated products begin performing worse after the first quarter, suggesting that weaker entities are indeed more likely to be over-allocated and unable to exploit this advantage. Regarding under-allocation, β_2 is also significantly negative. This implies that under-allocated entities are, on

TABLE 3
Sales performance as a function of deviations from the optimal initial budget share

Variables	Pred. sign	(1) *Q1_PERF_YTD*	(2) *Q2_PERF_YTD*	(3) *Q3_PERF_YTD*
Intercept		0.801	0.580	0.786
		[0.753]	[0.674]	[0.723]
%OVERALLOCATION	(−)	−12.450**	−12.968***	−11.320**
		[6.336]	[5.222]	[5.126]
%UNDERALLOCATION		−17.323**	−15.327**	−12.325*
		[7.871]	[7.078]	[7.061]
NEWPL		−0.677**	−0.423	−0.371
		[0.326]	[0.270]	[0.289]
LCYCLE		−0.085	−0.098	−0.040
		[0.198]	[0.179]	[0.162]
B_CM%		−2.375*	−1.692	−1.532
		[1.263]	[1.150]	[1.182]
LMSHARE		8.471***	6.951***	5.116**
		[2.390]	[2.039]	[2.164]
LAUNCH		−0.439**	−0.339**	−0.313**
		[0.189]	[0.155]	[0.142]
COMP		0.239	0.254	0.207
		[0.199]	[0.160]	[0.155]
Year fixed effects		Yes	Yes	Yes
Product-category fixed effects		Yes	Yes	Yes
Adjusted R^2		0.282	0.229	0.195
N		122	122	122

Notes: Indicated *p*-values are one-tailed for coefficients with predicted signs (i.e., "(+)" or "(−)") and two-tailed otherwise. Standard errors in brackets are adjusted for clustering within product lines over time. See the Appendix for variable definitions. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively.

average, not able to outperform their plan due to being disadvantaged from a resource allocation perspective.

To provide more evidence in favor of the rent-seeking argument, we create an indicator variable based on the productivity grouping that reflects a propensity toward rent-seeking. Based on the results in panel B of Table 2, we create the indicator variable *H_PROD* that equals one if the near-optimal share of the marketing budget of a product line is in quintile 5 and zero otherwise. As discussed before, if the rent-seeking story holds, then this highest quintile most likely represents the absence of rent-seeking. If rent-seeking of weaker entities is indeed present, we expect that the impact of *%OVERALLOCATION* on year-to-date performance will be more negative for $H\_PROD = 0$, as compared to $H\_PROD = 1$. This is because an over-allocation of a high-productivity product line is more likely to be driven by random errors and therefore expected to dampen sales performance to a lesser extent, if at all. In addition, in developing H1b, we stated that there can be two offsetting effects of an under-allocation. On the one hand, the under-allocation creates a resource disadvantage that hurts performance, while on the other hand, the under-allocated entities might be productive enough to counteract this disadvantage, resulting in a smaller performance decrease, or even no decrease at all. We thus also expect that the impact of *%UNDERALLOCATION* on year-to-date performance is more negative for $H\_PROD = 0$, as compared to $H\_PROD = 1$. The following model allows us to specifically test these expectations.

$$\begin{aligned} DV_{ikt} = {} & \beta_0 + \beta_1 \%OVERALLOCATION_{ikt} + \beta_2 \%UNDERALLOCATION_{ikt} \\ & + \beta_3 \%OVERALLOCATION_{ikt} \times H\_PROD_{ikt} \\ & + \beta_4 \%UNDERALLOCATION_{ikt} \times H\_PROD_{ikt} \\ & + \beta_5 H\_PROD_{ikt} + \Sigma_{j=1}^{m} \gamma_j X_{ikt} + v_{ikt}. \end{aligned} \tag{3}$$

We find evidence consistent with our rent-seeking expectations, as shown in Table 4. Specifically, we find that β_1, which is the coefficient for product lines where $H\_PROD = 0$, is negative and significant in all three quarters. Most importantly, we find that the interaction coefficient β_3 is marginally significantly positive in all three quarters, which implies that the negative association between *%OVERALLOCATION* and year-to-date performance is significantly smaller for product lines where $H\_PROD = 1$. The sum of the coefficients of β_1 and β_3, which reflects the coefficient of *%OVERALLOCATION* for product lines where $H\_PROD = 1$, is not significantly different from zero (untabulated).

Regarding *%UNDERALLOCATION*, we find a similar pattern. That is, we find that β_2 is negative and significant in all three quarters, while the interaction coefficient β_4 is marginally significantly positive. These results imply that under-allocation is negatively associated with performance for weak entities but less so for stronger ones. Regarding the latter, we find that the sum of the coefficients of β_2 and β_4 is not significantly different from zero (untabulated), which implies that under-allocation is not associated with performance for strong product lines.

In sum, the evidence in Tables 3 and 4 supports H1a as well as the arguments underlying the development of H1b. In particular, we provide evidence consistent with rent-seeking driving misallocations of the marketing budget.

Determinants of budget reallocations (H2a and H2b)

H2a and H2b predict that misallocation regarding the initial budget drives subsequent reallocation decisions (*IND_SHARECUT* or *%REALLOCATION*). In particular, we expect that budgets for over-allocated product lines are more likely to be cut, while the opposite holds for initially under-allocated ones. To test these predictions, we estimate the determinants of budget reallocations by using model (2) defined before but where the dependent variable is $IND\_SHARECUT_{ikt}$ or $\%REALLOCATION_{ikt}$.

TABLE 4
Sales performance as a function of deviations from the optimal initial budget share: High versus low productivity product lines

Variables	Pred. sign	(1) *Q1_PERF_YTD*	(2) *Q2_PERF_YTD*	(3) *Q3_PERF_YTD*
Intercept		0.864	0.602	0.837
		[0.809]	[0.735]	[0.796]
%OVERALLOCATION	(−)	−15.459**	−15.858**	−14.562**
		[7.924]	[6.933]	[6.856]
%UNDERALLOCATION	(−)	−28.782**	−23.342**	−19.089*
		[15.301]	[13.164]	[12.716]
%OVERALLOCATION×H_PROD	(+)	12.812*	12.688*	11.842*
		[9.712]	[8.093]	[7.230]
%UNDERALLOCATION×H_PROD	(+)	20.126*	16.654*	13.325*
		[12.162]	[10.309]	[9.418]
H_PROD		−0.421	−0.454*	−0.328
		[0.286]	[0.242]	[0.205]
NEWPL		−0.731**	−0.485	−0.409
		[0.351]	[0.298]	[0.313]
LCYCLE		−0.047	−0.056	−0.007
		[0.198]	[0.175]	[0.160]
B_CM%		−2.347*	−1.649	−1.519
		[1.271]	[1.168]	[1.200]
LMSHARE		8.199***	6.808***	4.804**
		[1.969]	[1.690]	[1.989]
LAUNCH		−0.445**	−0.327**	−0.309**
		[0.197]	[0.158]	[0.147]
COMP		0.243	0.275*	0.231
		[0.192]	[0.162]	[0.154]
Year fixed effects		Yes	Yes	Yes
Product-category fixed effects		Yes	Yes	Yes
Adjusted R^2		0.297	0.244	0.207
N		122	122	122

Notes: Indicated *p*-values are one-tailed for coefficients with predicted signs (i.e., "(+)" or "(−)") and two-tailed otherwise. Standard errors in brackets are adjusted for clustering within product lines over time. See the Appendix for variable definitions. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively.

In addition to the control variables used before, we further control for *Q3_PERF_YTD* in analyzing budget reallocation decisions. Uncertainty regarding investment opportunities can be resolved through observing realized sales performance, which might reveal potential over-allocations in the initial budget that, as we expect, will be addressed in reallocation decisions. Thus observed sales-to-date performance is an important trigger for reallocations. Controlling for performance during the year allows us to isolate the direct effect of initial misallocations on reallocation decisions beyond its effect through realized sales performance. For similar reasons, we also replace the budgeted contribution margin by the difference between the actual and budgeted contribution margin (*CH_CM%*).

The results regarding *IND_SHARECUT*, reported in column (1) of Table 5, provide evidence that product lines allocated a larger share of the marketing budget than the near-optimal share are significantly more likely to be cut during the year ($\beta_1 > 0$). Surprisingly, we find that the adjustments are asymmetric, because initially under-allocated products are, on average, not less likely to

TABLE 5
Budget reallocations as a function of deviations from the optimal initial budget share

Variables	Pred. sign	(1) *IND_SHARECUT*	Pred. sign	(2) *%REALLOCATION*
Intercept		−3.269***		0.007
		[1.244]		[0.008]
%OVERALLOCATION	(+)	37.622***	(−)	−0.235**
		[16.150]		[0.119]
%UNDERALLOCATION	(−)	−5.277	(+)	−0.021
		[10.808]		[0.047]
Q3_PERF_YTD		−2.879***		0.002**
		[0.702]		[0.001]
NEWPL		−1.132		0.004
		[0.722]		[0.004]
LCYCLE		−0.751		0.008***
		[0.482]		[0.003]
CH_CM%		−2.373***		0.006***
		[0.521]		[0.002]
LMSHARE		8.513*		0.014
		[4.877]		[0.024]
LAUNCH		0.382		0.001
		[0.320]		[0.002]
COMP		0.028		−0.001
		[0.411]		[0.005]
Year fixed effects		Yes		Yes
Product-category fixed effects		Yes		Yes
Pseudo R^2		0.394		0.255
N		122		122

Notes: Indicated *p*-values are one-tailed for coefficients with predicted signs (i.e., "(+)" or "(−)") and two-tailed otherwise. Standard errors in brackets are adjusted for clustering within product lines over time. See the Appendix for variable definitions. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively.

be cut (β_2 is not significant in explaining *IND_SHARECUT*). We observe a similar pattern of results in column (2) of Table 5. That is, *%OVERALLOCATION* is significantly negatively associated with *%REALLOCATION*, while *%UNDERALLOCATION* is not significantly associated with *%REALLOCATION*. This implies the likelihood of a budget being cut is not only associated with the extent to which a product line is over-allocated but also the size of the cut. Last, both models show that the likelihood and magnitude of budget share cuts increase with decreasing *Q3_PERF_YTD* and *CH_CM%*, consistent with performance being associated with reallocation decisions.

To provide more evidence in favor of the rent-seeking argument, we again examine whether the productivity of a product line affects the relation between initial misallocations and reallocations. Specifically, we run model (3) with *IND_SHARECUT* or *%REALLOCATION* as the dependent variable and *Q3_PERF_YTD* and *CH_CM%* as additional control variables. The results for *IND_SHARECUT*, presented in column (1) of Table 6, show a pattern consistent with initial rent-seeking playing a role in budget reallocation decisions. Specifically, we find that β_1 is significantly positive and β_3 is significantly negative. This implies that for less productive product lines, which are more likely to rent-seek, the likelihood of a budget cut is higher the higher the over-allocation. However, this effect is significantly less present for more productive product lines, which are less likely to rent-seek. The sum of the coefficients of β_1 and β_3, which reflects

TABLE 6
Budget reallocations as a function of deviations from the optimal initial budget share: High versus low productivity product lines

Variables	Pred. sign	(1) *IND_SHARECUT*	Pred. sign	(2) *%REALLOCATION*
Intercept		−3.543***		0.006
		[1.095]		[0.008]
%OVERALLOCATION	(+)	47.022***	(−)	−0.277**
		[17.638]		[0.115]
%UNDERALLOCATION	(−)	17.019	(+)	0.079
		[16.887]		[0.067]
%OVERALLOCATION×H_PROD	(−)	−36.903**	(+)	0.110
		[19.530]		[0.213]
%UNDERALLOCATION×H_PROD	(−)	−37.680**	(+)	−0.076
		[18.394]		[0.091]
H_PROD		0.729		−0.002
		[0.669]		[0.005]
Q3_PERF_YTD		−2.998***		0.002**
		[0.756]		[0.001]
NEWPL		−1.078		0.003
		[0.775]		[0.005]
LCYCLE		−0.792		0.009***
		[0.505]		[0.003]
CH_CM%		−2.075***		0.006***
		[0.559]		[0.002]
LMSHARE		10.967**		0.012
		[4.901]		[0.030]
LAUNCH		0.415		0.002
		[0.339]		[0.002]
COMP		−0.081		0.000
		[0.342]		[0.005]
Year fixed effects		Yes		Yes
Product-category fixed effects		Yes		Yes
Pseudo R^2		0.417		0.267
N		122		122

Notes: Indicated *p*-values are one-tailed for coefficients with predicted signs (i.e., "(+)" or "(−)") and two-tailed otherwise. Standard errors in brackets are adjusted for clustering within product lines over time. See the Appendix for variable definitions. ** and *** represent significance levels of 0.05 and 0.01, respectively.

the coefficient of *%OVERALLOCATION* for product lines where *H_PROD* = 1, is not significantly different from zero (untabulated). That is, budgets for highly productive product lines that are over-allocated are not more likely to be cut, consistent with these over-allocations being most likely driven by random errors that are least likely to be penalized.

Regarding under-allocations and *IND_SHARECUT*, we find that β_2, the coefficient for product lines where *H_PROD* = 0, is not significant, while the interaction coefficient β_4 is significantly negatively. We additionally find that the sum of the coefficients of β_2 and β_4, which captures the coefficient for product lines where *H_PROD* = 1, is significantly negative. These results imply that, for less productive product lines, being under-allocated does not lower the likelihood of being cut, while for more productive product lines, being under-allocated does lower the likelihood. These findings comport with reallocation decisions considering the initial

allocation decision and especially the underlying rent-seeking; budgets for over-allocated rent-seekers are more likely to be cut, while those for under-allocated "cross-subsidizers" are less likely to be cut. The results in column (2) of Table 6 regarding the size of the reallocation, that is, *%REALLOCATION*, do not show any significant interaction effects.

Overall, the results in Tables 5 and 6 confirm that managers indeed take the initial budget allocation into account when deciding on reallocations during the year, over and above the changes in expectations with respect to sales and profit performance. In particular, we find strong evidence for H2a, as initial over-allocation is, on average, associated with subsequent budget cuts, and significantly more so for less productive product lines, which are more likely to rent-seek. While we do not find an average effect of under-allocation on budget share cuts, we do show that under-allocation lowers the probability of a budget cut for more productive product lines, which provides evidence for H2b.

Performance consequences of budget reallocations (H3)

The reason why firms redistribute the initially allocated budget is their assumption that reallocations will either increase performance of the entities that receive an additional share of the budget or mitigate the losses of entities by managing profits via cuts in the share of expenses. However, it is an empirical question whether, and in which direction, budget reallocations affect performance. To illuminate this issue, we perform an exploratory analysis to investigate the consequences of budget reallocations for two different types of performance measures, the annual change in market share as an externally oriented measure of market performance and sales performance in the final quarter as an internally oriented measure of sales plan achievement.[16] In particular, we estimate the following model.

$$DV_{ikt} = \beta_0 + \beta_1 \%BOOST_{ikt} + \beta_2 \%CUT_{ikt} + \sum_{j=1}^{m} \gamma_j X_{ikt} + \nu_{ikt}, \quad (4)$$

where the dependent variable is the annual change in market share (*CH_MSHARE*) or sales performance in the final quarter (*Q4_SALESPERF*). We measure *CH_MSHARE* as the percentage point change in market share from the previous to the current year. *Q4_SALESPERF* is measured as the percentage deviation of the realized sales from the planned sales in the last quarter, before the start of which all reallocations have happened. Our main independent variables, *%BOOST* and *%CUT*, capture the budget reallocations, each of which we measure in two different ways. First, we examine the change in the budget *share*, relative to the other product lines, as captured by the previously defined variable *%REALLOCATION*, which we use to test our main hypothesis.[17] We separate budget share boosts from budget share cuts by creating two variables based on *%REALLOCATION*. *%SHAREBOOST* (*%SHARECUT*) equals *%REALLOCATION* ($-1 \times$ *%REALLOCATION*) if *%REALLOCATION* is positive (negative) and zero otherwise.

In the case of the total budgeted marketing expenses equaling the total actual spending level, changes to a product line's budget share directly translate into the corresponding changes to the

16. We focus on sales performance in the fourth quarter as reallocations are typically conducted in the second half of the year but no later than the end of the third quarter. We do so to ensure that the reallocations can still possibly have an effect in the same year.

17. From an efficiency perspective, the conceptually correct variable to measure reallocations is the change in the share, relative to the other product lines. That is, efficiency is about *how* the resources are allocated. Thus our focus in the theory development and the analysis of H2 is on the share of the pie that a product line had initially versus the share after the reallocation. The goal is the most efficient exploitation of investment opportunities at the firm level, and thus the budget of one product line, *relative* to the other product lines, matters. From an efficiency point of view, which is our focus, it does not matter whether the pie changes.

product line's budget *level* (in monetary terms), given that the "pie" remains constant; that is, reallocations are a zero-sum game. However, at our research site, the total actual spending level ex post can differ from the total budget level ex ante, which changes the total pie to be allocated. Thus, either extra resources might become available for allocation during the year or the marketing expenditures allocated to ConsumerCo are reduced.[18] To capture the separate effect of actual changes to the budget level, we create separate variables capturing the degree to which product lines actually are cut or receive additional money. We measure *%LEVELCHANGE* as the realized marketing expenditures (in €) minus the budgeted marketing expenditures (in €), scaled by the budget. As with the budget share reallocations, we then separate budget boosts from budget cuts by creating two variables based on *%LEVELCHANGE*. *%LEVELBOOST* (*%LEVELCUT*) equals *%LEVELCHANGE* ($-1\times$*%LEVELCHANGE*) if *%LEVELCHANGE* is positive (negative) and zero otherwise.

Besides the control variables used in the previous models, we also add the indicator variable *TV*, assuming the value of one when the product line is advertised via TV commercials and zero otherwise. We control for year and product-category fixed effects and cluster the standard errors by product line.

The results are reported in Table 7. In line with the firm's intentions, a budget boost in terms of share or level during the year is positively associated with reaching internal sales plans in the last quarter. However, neither of these is associated with an annual change in market share, the ultimate indicator of product line success. These results suggest that managers plan based on the resources they initially are allocated and thus receiving more resources than expected does not induce them to use this money efficiently. The fact that budget boosts do support sales plan achievement but do not seem to translate internal sales performance into external market performance is remarkable, given that the ultimate goal of reallocations is to optimize market share. This specifically implies that, to the extent that budget boosts are used to exploit emerging market opportunities, managers seem unable to use the additional resources to outperform competitors. Regarding budget cuts, *%SHARECUT* is not associated with either performance measure. More relevant, while *%LEVELCUT* is not associated with sales relative to plan, it is negatively associated with the annual change in market share. This suggests that unexpected budget cuts during the year interfere with the marketing strategy the product line managers had conceived, implying that those whose budgets were cut cannot stick to their plans, which leads to their being outperformed by competitors. In sum, our results suggest that, while budget reallocations do seem to overall improve internal sales performance, they show an overall negative association with external market performance.[19] That is, as soon as competition is taken into account, the reallocations seem to fail to achieve their goal. In an attempt to achieve a more efficient budget via reallocations, managers distort operations even more, making the reallocations ex post inefficient.

18. Several conditions can cause this change in the total spending level. ConsumerCo has a corporate account that carries the budget for any activities that cannot be attributed to an individual product line. If extra resources are available from this account, they can be allocated to the other product lines to enhance their performance. Further, in rare cases, MotherCo allocates extra resources to be spent on the marketing of ConsumerCo. Such extra resources are made available, for instance, when a competitor (unexpectedly) launches a new product and a fast response is required. Lastly, if the bottom line of ConsumerCo does not develop as desired, MotherCo may also decide to cut the resources allocated to ConsumerCo to safeguard profits. In such a case, the managing director of ConsumerCo and the controlling department must decide which product lines' budgets will be reduced.

19. We acknowledge that changes in market share also depend on competitor actions and that an increase in sales that is not accompanied by an increase in market share might indicate an aggressive market. However, given the firm's objective of continuous growth in market share, a stagnation or decrease in market share can be unsatisfactory outcomes for MotherCo.

TABLE 7
End-of-year performance as a function of budget reallocations

Variable	(1) *CH_MSHARE*	(1) *CH_MSHARE*	(2) *Q4_SALESPERF*	(2) *Q4_SALESPERF*
Intercept	0.005	0.006	−0.262	0.221
	[0.009]	[0.008]	[0.500]	[0.537]
%SHAREBOOST	0.029		33.207**	
	[0.174]		[13.496]	
%LEVELBOOST		−0.000		0.696***
		[0.001]		[0.238]
%SHARECUT	−0.181		−6.607	
	[0.218]		[10.713]	
%LEVELCUT		−0.006**		−1.302
		[0.003]		[0.827]
NEWPL	0.005	0.006*	−0.059	0.216
	[0.003]	[0.003]	[0.422]	[0.458]
LCYCLE	0.003	0.003	−0.049	0.010
	[0.003]	[0.002]	[0.165]	[0.166]
CH_CM%	0.005**	0.004*	−0.147	−0.422*
	[0.002]	[0.002]	[0.354]	[0.237]
LMSHARE	0.021	0.019	0.566	−0.187
	[0.026]	[0.024]	[2.643]	[2.519]
LAUNCH	−0.004	−0.005	−0.253*	−0.287**
	[0.003]	[0.004]	[0.125]	[0.136]
COMP	0.003	0.002	0.085	−0.081
	[0.005]	[0.005]	[0.158]	[0.130]
TV	−0.008*	−0.008**	0.167	−0.401*
	[0.004]	[0.004]	[0.217]	[0.228]
Year fixed effects	Yes	Yes	Yes	Yes
Product-category fixed effects	Yes	Yes	Yes	Yes
R^2	0.202	0.209	0.086	0.383
n	122	122	122	122

Notes: Standard errors in brackets are adjusted for clustering within product lines over time. See the Appendix for variable definitions. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, two-tailed, respectively.

6. Conclusion

We provide first insights into the determinants and consequences of budget reallocations. Budget reallocations might well be justified for a particular budgeted entity as new and valuable information is revealed during a period. However, given the scarcity of resources, changes to the budget of one entity typically also require changes to the budget of another. We show that such reallocations are directly linked to the initial budgeting, in the sense that misallocations regarding initial allocations are associated with reallocations, with the aim of correcting inefficiencies.[20] Most importantly, we show that ultimately these reallocations do not lead to performance improvements, suggesting that reallocations might not mitigate the effects of the initial

20. Our analysis assumes the measurement of the near-optimal allocation (and thus misallocation) sufficiently captures the "real" near-optimal allocation. While the near-optimal allocation rule is valid under very general assumptions, we are to some extent restricted in estimating the parameters that go into this rule. As such, our hypotheses tests are joint tests of the hypotheses and the validity of the underlying empirical measure.

misallocations. They might even make things worse. While we show that initially over-allocated entities do experience cuts in the reallocation process, these remedies might come too late. In other words, the best way to achieve high performance is to avoid misallocations in the first place. This emphasizes the value of efficient budgeting, justifying the high amount of money and time firms put into their annual budgets.

There are a number of features specific to our setting worth discussing in light of the generalizability of our results. One important feature is that sales and profit plans for the business groups are set in a top-down manner. While such planning policies are not unusual, this design feature has two important implications.[21] First, managers can, in general, lobby for numerous things, including easier performance targets (slack) and more resources. In our setting, sales managers have no opportunity to lobby for lower sales plans, which leaves only lobbying for more resources as an option, that is, a higher marketing budget. Therefore, lobbying efforts in our setting are concentrated on the marketing budget. While this fact is surely not generalizable, what matters is that the allocation of resources is perturbed by rent-seeking, a finding that has also been shown in literature and is not specific to this setting. Under a more participative planning process, the incentives for rent-seeking remain, but negotiations become more complicated because plans are a key determinant of budget allocations. That is, the measurement of the near-optimal share would be obscured by rent-seeking in the planning process and/or other drivers of cross-subsidization might play a bigger role. Thus, we can test our theory in a rather clean setting. Second and relatedly, given the planning process, the relative difficulty of the plans is higher for weaker entities. If over-allocation is associated with weak versus strong entities, then over-allocation is also expected to be associated with sales performance, compared to plans. In a setting where managers can influence their sales plans, we might not find an association between misallocations and sales performance, given that such plans could reflect the relative strength of entities. This implies that, to test the underlying theory that relates to cross-subsidization, we merely use an empirical design choice specific to our setting. A final important feature of our setting is that product line managers do not have explicit targets related to product line profits, implying that they do not bear the direct cost of having a higher marketing budget. This also implies that the benefits of rent-seeking are relatively high, which makes our setting a powerful one for testing our theory. We acknowledge that under a different corporate planning process or an alternative incentive scheme for product line managers, rent-seeking could be less beneficial. Clearly, if there is no rent-seeking in the initial budget allocation process, then there is also no need to use reallocations to correct for such inefficiencies. Our results do not suggest otherwise. More importantly, it is safe to assume that not all information and agency problems are resolved by such alternative mechanisms and thus that (some) rent-seeking will remain "in equilibrium" (Stein 2003, 113), that is, in settings other than the one we examine. In sum, while some of our key empirical design choices are specific to our setting, our theoretical arguments and the inferences we draw are not.

Key to the problem we investigate is the inability of organizations and researchers alike to observe rent-seeking. We thus cannot provide direct evidence that the cross-subsidization and its correction we show are indeed driven by rent-seeking. We acknowledge that no single test by itself can confirm rent-seeking. However, the entirety of our empirical evidence, across multiple tests, is consistent with rent-seeking at least partially driving cross-subsidization and inconsistent with alternative explanations suggested by literature (i.e., naïve diversification). We therefore interpret our findings as evidence that correction for rent-seeking is one important driver of the budget reallocations, yet most likely not the only one. We do acknowledge that additional drivers of cross-subsidization other than rent-seeking will play a role in reallocation decisions that might also influence our findings.

21. In fact, around 50% of multidivisional firms indicate setting business group targets in a rather top-down way, most importantly due to the pressure of meeting or beating the corporate target (Feichter et al. 2018).

Appendix

Variable definitions

Variable	Definition
BUDGETSHARE	The total marketing budget of product line *i* divided by the sum of all marketing budgets of the division
OPTIMALSHARE	The *near-optimal* share of the marketing budget per product line
MISALLOCATION	Excess marketing budget at the product line level in a given year; that is, *BUDGETSHARE* − *OPTIMALSHARE*
CAT_ PRODUCTIVITY	An ordinal variable ranging from 1 to 5, representing the quintiles of *OPTIMALSHARE*
%OVERALLOCATION	Equals *MISALLOCATION* if *MISALLOCATION* is positive and zero otherwise
%UNDERALLOCATION	Equals $-1\times$*MISALLOCATION* if *MISALLOCATION* is negative and zero otherwise
IND_OVERALLOCATION	An indicator variable that equals one if *MISALLOCATION* is nonzero, and zero otherwise
%REALLOCATION	The difference between the budgeted and actual share of marketing capital received
IND_SHARECUT	An indicator variable that equals one if *%REALLOCATION* is negative, and zero otherwise
PLANSLS	The budget sales of product line *i*
NPL	The number of product lines at time *t*
SHARE_EQUAL	1 over *NPL*, representing the expected share of the marketing budget if it was divided equally over all product lines
SHARE_SIZE	The lagged actual sales of product line *i* divided by the sum of lagged actual sales of the division, representing the relative size of the product line
NEWPL	An indicator variable that equals one if a new product line is launched, and zero otherwise
LCYCLE	An indicator variable that equals one when a product line *i* is in the growth stage, and zero when it is in the maturity stage
B_CM	Total budgeted contribution margin per product line *i*, exclusive marketing cost in euros
B_CM%	Budgeted average contribution margin to sales ratio per product line *i*, exclusive marketing cost
CH_CM%	The difference between actual and budgeted average contribution margin to sales ratio per product line *i*, exclusive marketing cost
COMP	An indicator variable that equals one if the degree of competition in the product line's market is high and zero otherwise
LMSHARE	The lagged market share per product line *i*
LAUNCH	An indicator variable that equals one in the case of at least one launch in the product line *i* in division *j* at time *t*, and zero otherwise
MSHARE	The market share per product line *i*
Q1_PERF_YTD	Year-to-date performance after the first quarter in terms of sales target achievement, calculated as the realized sales after the first quarter minus the budgeted sales after the first quarter (extrapolated from the total budgeted sales), scaled by the budget

(The table is continued on the next page)

(continued)

Variable	Definition
Q2_PERF_YTD	Year-to-date performance after the second quarter in terms of sales target achievement, calculated as the realized sales after the second quarter minus the budgeted sales after the second quarter (extrapolated from the total budgeted sales), scaled by the budget
Q3_PERF_YTD	Year-to-date performance after the third quarter in terms of sales target achievement, calculated as the realized sales after the third quarter minus the budgeted sales after the third quarter (extrapolated from the total budgeted sales), scaled by the budget
Q4_ PERF_YTD	Year-to-date performance after the fourth quarter in terms of sales target achievement, calculated as the total annual realized sales minus the total budgeted annual sales, scaled by the budget
CH_MSHARE	The percentage point change in market share from the previous to the current year
Q4_SALESPERF	The realized sales in the fourth quarter minus the budgeted sales in the fourth quarter (extrapolated from the total budgeted sales), scaled by the budget
%SHAREBOOST	Equals *%REALLOCATION* if *%REALLOCATION* is positive and zero otherwise
%SHARECUT	Equals $-1\times$*%REALLOCATION* if *%REALLOCATION* is negative and zero otherwise
%LEVELCHANGE	The realized marketing expenditures (in €) minus the budgeted marketing expenditures (in €), scaled by the budget
%LEVELBOOST	Equals *%LEVELCHANGE* if *%LEVELCHANGE* is positive and zero otherwise
%LEVELCUT	Equals $-1\times$*%LEVELCHANGE* if *%LEVELCHANGE* is negative and zero otherwise
TV	An indicator variable that equals one if the product line is advertised via TV commercials and zero otherwise

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SUPPORTING INFORMATION

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Online Appendix. Supporting information