Resource re-allocation capabilities in internal capital markets: The value of overcoming inertia

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1 INTRODUCTION

A private enterprise economy is based not only on how markets and prices can reallocate resources, but also on how strategic managers and business firms can allocate externally sourced and internally generated capital to new and better opportunities (Nelson, 1981). Understanding capital allocation in a market economy requires insights from strategic management and economics. Through the combined study of markets and managers operating inside business organizations, meaningful insights into how the private enterprise system allocates capital can be developed. Like financial markets, a firm's internal capital market must allocate capital to high-yield opportunities/uses and away from low- or negative-yield activities for the firm to function properly.

Economics has neglected firm-level resource allocation, and the focus of modern finance has been asset pricing and capital structure. This creates a void in examining internal capital markets (henceforth, ICMs). Strategic management is well-positioned to fill this void. The strategic management literature recognizes several paradigms: Porter's (1980) Five Forces and Positioning (Porter, 1985, 1996), the Resource-Based View (e.g., Amit & Schoemaker, 1993; Barney, 1991; Wernerfelt, 1984), Added Value (Brandenburger & Stuart, 1996, 2007), Transaction Cost Economics (Williamson, 1975, 1985), and Dynamic Capabilities (Teece, 2007, 2014; Teece, Pisano, & Shuen, 1997). We find inspiration in investigating resource allocation from the dynamic capabilities framework due to its focus on shifting assets over time, which is the essence of resource allocation flow. Specifically, we find the asset orchestration aspect of the dynamic capabilities framework particularly relevant.

There are two primary areas where asset orchestration competencies may differ between firms: investment timing and managerial discretion. That is, managers must be both intelligent enough to identify an area where reallocation would be beneficial and also have the processes in place to quickly take action to profit from that intelligence. In the past, asset orchestration capabilities generally have been perceived as revolving around the former competency, the managerial ability to "make well-timed investments" (Bower, 1970; Bromiley, 1986; Helfat et al., 2007; Teece, 2009) and to effectively combine and deploy those investments (Helfat et al., 2007). This view assumes that firms, to different degrees, possess allocation processes that allow managers to be able to redirect resources to the right place at any point in time, neglecting the latter competency. Our observation is that this is not always the case. We posit that firms differ in their ability to move resources across the organization and that reallocation processes are a necessary condition to make the right investments over time.

The present study attempts to advance our understanding of private-enterprise market economies by demonstrating the correlations between performance and the different levels and directions of the allocation of financial assets inside the firm. We empirically study the links among the flow of capital allocation across business segments and firm performance. The study of financial capital flows in multibusiness firms allows for the measurement of financial resource allocation flow across business segments, as the amount of capital that each receives over time is observable.[1] To that end, we devise a measure for the reallocation of financial capital expenditures across business units, deviation of investment ratio (DIR), which measures the difference between previous years' financial investment in business segments and the current year.[2]We examine the correlations between DIR with financial performance using a sample of Compustat firms. Our analysis finds a consistent inverted U-shape (or V-shape) relationship between those measures and firm profitability. That is, there appear to be benefits associated with reallocation up to a critical inflection point, and then, after that point, any further reallocation is associated with a decline in firm performance. Interestingly, the analysis determines that the overwhelming majority of firms (98–99% in most cases) are to the left of the inflection point, lying in the region where more reallocation is associated with positive gains in firm performance.

The article is structured as follows. Section 2 discusses and hypothesizes the link between reallocation flow and firm performance. Section 3 describes the data and methods used in the empirical analysis. Section 4 presents the results of those tests. Section 5 presents a discussion, and Section 6 offers some conclusions.

2 FINANCIAL REALLOCATION FLOWS AND FIRM PERFORMANCE

At a most basic level, capital reallocation capabilities are indicated by the degree to which a firm changes the amount of capital expended across its business units. Hypothesizing the link between capital reallocation and performance is not

[1] The measure is the 3 digit Compustat industry classifications.

[2] We view our metric as analogue to the metrics available to examine allocations in external capital markets (e.g., price, volatility, volume); there surprisingly few metrics to measure internal capital allocation processes.

straightforward. One could argue, as the asset orchestration literature does, that reallocation should have a positive effect on firm performance (e.g., Teece, 2007). However, Winter (2003, p. 993) notes that "attempting too much change … can impose additional costs when the frequent disruption of the underlying capability outweighs the competitive value of the novelty achieved." In this light, haphazard or excessive capital reallocation could negatively affect performance in a number of ways. First, if one assumes that internal capital markets are often inefficient due to poor managerial decisions or costly power struggles (e.g. Ozbas & Scharfstein, 2010), then it follows that greater reallocation would hurt performance. Second, a high degree of reallocation creates substantial disruption in the firm's operations (e.g., some employees must leave the firm or be reassigned to a different task, new people come in, new processes need to be put in place, etc.). Consistently maintaining a high level of disruption can compromise the success of any strategy. Third, reallocation could be a direct consequence of the firm's decision to deviate from current industry investment norms in order to create an advantage over rivals. Thus, a firm could invest in any specific business unit at a higher or lower rate than its rivals. A lower level of investment would probably imply little-to-no upgrading of physical capital and significant loss of key human capital, which could prevent the firm from achieving or sustaining any kind of competitive advantage (Sirmon & Hitt, 2009). A higher level of investment should lead to increased competitiveness (Kor & Mahoney, 2005), but it could also imply the disruption of the industry status quo (thus generating competitive response), an overall higher degree of risk for the firm (the additional investment going to riskier projects), and an increase in the firm's slack, all factors leading to inferior performance (Sirmon & Hitt, 2009). The combination of the generally positive effects of allocation flow with the potential pitfalls of large and continuous levels of resource reallocation lead us to the following hypothesis:

Hypothesis 1: The relationship between resource-allocation flow across business segments and firm performance will be positive up to a certain threshold and become negative after that point.

3 DATA AND VARIABLES

Our dataset is constructed from COMPUSTAT files from between 1990 and 2007.[3] We eliminated financial institutions from our sample, given their different treatment of capital expenditures. We also eliminated segments with incomplete or conflicting accounting data (zero depreciation, capital expenditures greater than sales, capital spending less than zero), and segments with sales less than $1 million,[4] as well as firms with sales below $50 million. (Reallocation of capital across segments may only be challenging when firms reach a certain size.) Along the same lines, to be included in the sample, a firm needs to have at least two segments that satisfy the above requirements for at least two consecutive years. The resulting sample contains 1,917 unique firms with a total of 11,192 firm-year observations for ROA (Return on Assets) and 1,044 unique firms with a total of 5,772 firm-year observations for Absolute Value Added (AVA). Table 1 reports the summary characteristics of our data set.

3.1 Firm performance

To measure firm performance, we decompose a firm's profitability, as measured by ROA into industry and industry-adjusted profitability:

$$Ind.\ ROA_{f,t} = \sum_{j \in F} w_{j,t-1} ROA_{j,t} \qquad Ind.Adj.\ ROA_{f,t} = ROA_{f,t} - Ind.\ ROA_{f,t}$$

where $w_{j,t-1}$ is the asset weight of segment j for firm f in year t-1, and $ROA_{j,t}$ is the median ROA of single-segment firms in segment j's industry (using three-digit SIC code classification). Thus, the industry profitability is the profitability of a hypothetical firm that mimics the asset composition across industries of firm f, and the industry-adjusted profitability is the difference between the profitability of

[3] We suspect firm resource allocation was significantly affected in the aftermath of the economy-wide credit shock and believe that the post-crisis period merits a study of its own, although including the post-crisis years in our current sample does not qualitatively alter the results.

[4] We used only the reported COMPUSTAT operating segments. Given that we are interested in measuring aggregate changes in segment investment for firms over time, as long as there is within-firm consistency in the definition of those segments we do not need between-firm consistency in that reporting. We took additional care in ensuring that withinfirm consistency.

TABLE 1 Descriptive statistics

	# obs	Mean	SD	Min	Max
Industry adjusted return on assets (Adj. ROA)	11,192	0.061	0.117	−0.543	0.801
Absolute value added (AVA)	5,772	0.001	0.028	−0.554	0.341
Deviation of investment ratio (DIR)	11,159	0.036	0.064	0.000	0.857
Firm size	11,185	6.969	1.663	4.001	10.988
Firm cash	10,938	0.056	0.070	0.000	0.399
Firm capex growth	11,059	0.248	0.935	−0.907	8.269

firm f and its industry profitability. In our analysis of the reallocation-performance link throughout the article, we use industry-adjusted profitability as the dependent variable.

Our alternative measure of firm performance, AVA, comes from Rajan, Servaes, and Zingales (2000), who measure a variant of internal allocation performance. In essence, this variable measures the extent to which a firm is good at investing more (relative to the industry median) in businesses with higher future prospects (as proxied by Tobin's q) and less in businesses with lower future prospects. Following Rajan et al. (2000), we define AVA by allocation as

$$AVA_t = \frac{\sum_{j=1}^{N} assets_{j,t} * (q_j - 1) * \left(\frac{capx_{j,t}}{assets_{j,t}} - \frac{capx_{j,t}^{ss}}{assets_{j,t}^{ss}}\right)}{Firm\ Assets_t}$$

where j is each one of the firm's N business units, q is the estimated Tobin's q for business and $\frac{capx_{j,t}^{ss}}{assets_{j,t}^{ss}}$, the average investment ratio for the single-segment firms in segment j's industry.

3.2 Resource allocation flow

We aim to capture the level of reallocation of financial capital across the firm's segments in a given year. Our Deviation of Investment Ratio (DIR) uses the firm's own capital allocation in the previous year as a benchmark. If firms simply decided to replicate the previous year's allocation when making investment decisions, the result would be a very rigid capital allocation rule that would likely ignore changes in industry environment or the particular needs of each business unit over time.[5]

The DIR measure is defined as the change in the investment ratio across business units over time:

$$\text{Deviation of Investment Ratio (DIR)} = \sum_{\mathrm{i}\,\in \mathrm{F}} w_{i,t-1} \left| \frac{CAPX_{i,t}}{AT_{i,t}} - \frac{CAPX_{i,t-1}}{AT_{i,t-1}} \right|,$$

where *CAPX* is

where CAPX is the capital expenditure of segment i in firm F in year t, AT is total assets of segment i in firm F in year t, and w is the asset share of each segment in firm F in year t.

The DIR measure captures the rigidity in the capital-allocation process: Firms that commit to maintaining stable allocations over time have low DIR, and firms that actively reallocate capital across their business units have a high DIR.

3.3 Methods

We use a firm fixed-effects model. For further robustness of the model, we cluster errors by firm and add time dummies. Following the previous literature (e.g., Arrfelt, Wiseman, & Hult, 2013), we include control variables, such as an estimate of firm size (logarithm of firm total sales), a ratio of liquidity (firm cash to assets), and the firm's yearly capital expenditure growth. We look at two specifications that could capture quantitatively the predictions of Hypotheses 1:

$$Performance_{it} = \alpha + \ b_1 DIR_{ij} + b_2 DIR_{ij}^2 + \beta X_{it} + u_{it} \ (1)$$

$$Performance_{it} = \alpha + \ b_1 \min\,(c, DIR_{ij}) + b_2 \max\,(DIR_{ij} - c, 0) + \beta X_{it} + u_{it} \ (2)$$

In Equation 3, we estimate the quadratic relationship of DIR with performance measures. Quadratic relations are frequently employed in similar studies, but recent developments suggest they can be mis-specified (Haans, Pieters, & He, 2016; Simonsohn, 2018). As a robustness check, we also estimate a piecewise regression in Equation 4: DIR will vary with b_1 up to a certain point c and then vary with b_2

[5] Harris and Raviv (1996) and Ozbas (2005) suggest that rigid capital budgeting can be useful and even optimal when there is asymmetric information and agency conflicts between headquarters and division managers.

above that cutoff. This inverse-V approach shares some similarities with Simonsohn's (2018) suggested two-lines alternative. In both cases, Hypothesis predicts a positive b_1 coefficient and negative b_2 coefficient.

It is important to note that the specifications outlined in Equations 3 and 4 will only detect a correlation between performance and the other variables. It is our contention, based on the preponderance of the previous literature (see Section 2), that there is a directional relation from changes in resource allocation to firm performance. Our regression models cannot provide any more evidence of this fact. That is, they cannot rule out (a) time-variant, firm-specific, omitted variables causing both changes in resource allocation and firm performance; or (b) firm performance causing resource allocation. We will present the correlational results from the model as suggestive evidence of our claim.

It is also crucial to assess just how stable reallocation is within any given firm. Winter (2003) notes that ad hoc problem-solving is not necessarily a capability. A firm might be inclined to reallocate large amounts of capital across business units in a given year in response to an internal or external event, yet high reallocation may not be a stable feature of its resource-allocation process in following years. This way of allocating resources is rarely effective, as such changes are often undertaken too late. Fortunately, we find the reallocation variables DIR to be significantly stable over time, as the regression coefficients of the relationship between the variable at periods t and t−1 are 0.453.

4 RESULTS

Table 2 shows the regression estimates of the models using industry-adjusted ROA as dependent variable.

The estimates for the DIR measure using a quadratic specification show a positive coefficient for first-order DIR and a negative coefficient for quadratic DIR. The 95% confidence

TABLE 2 Reallocation and industry-adjusted return on assets (ROA)

	Dependent variable: Industryadjusted return on assets (ROA)	
	(1)	(2)
DIR	0.069	
	(2.01)	
DIR^2	−0.124	
	(−2.01)	
DIR below cutoff[a]		0.057
		(2.16)
DIR above cutoff		−0.066
		(−1.87)
Firm size	−0.001	−0.001
	(−0.33)	(−0.33)
Firm cash-to-asset ratio	0.074	0.074
	(2.96)	(2.97)
Firm capex growth	0.000	0.000
	(0.49)	(0.48)
Constant	0.041	0.041
	(1.38)	(1.38)
Observations	10,777	10,777
R-squared	0.052	0.052
Number of firms	1,885	1,319
Firm fixed effects	Yes	Yes
Year dummy variables	Yes	Yes

Note: All t-statistics are determined by cluster-robust standard errors at the firm level. [a]The cutoff value is chosen to maximize the log likelihood of Equation 4, it is 0.2557.

intervals of the two terms—(0.001, 0.135) and (−0.244, −0.003), respectively—do not overlap and are separated by 0. As stated in Hypothesis , this specific, two-part relation suggests that a moderate or even large amount of yearly reallocation across the firm's portfolio positively affects performance, but that very large amounts degrade performance. Similar results are found in a piecewise regression where we exogenously choose cutoff c (see Equation 4) to the level that maximizes the log likelihood.[6] All results are consistent with the view that one of the key tasks of the resource-allocation process is to rationalize the use of resources across the firm (Penrose, 1959; Williamson, 1975). A modest amount of reallocation could signal a firm that knows how to prune some investment from a mature or declining business and redirect it toward a growing one. A large amount of reallocation could signal a firm that is either reacting to a crisis (and thus has a smaller chance to overperform in the near future) or a firm that has no coherent strategy (Rumelt, 2011).

[6] The cutoff is a DIR of 0.2557; note that only 194 (1.80%) observations are greater than that cutoff (see Figure 1).

TABLE 3 Reallocation and added value to allocation (AVA)

	Dependent variable: added value to allocation (AVA)	
	(1)	(2)
DIR	0.072	
	(4.04)	
DIR^2	−0.093	
	(−3.53)	
DIR below cutoff[a]		0.06
		(3.08)
DIR above cutoff		−0.077
		(−1.79)
Firm size	−0.001	−0.001
	(−0.83)	(−0.84)
Firm cash-to-asset ratio	0.006	0.006
	(0.45)	(0.47)
Firm capex growth	0.002	0.002
	(3.61)	(3.58)
Constant	0.007	0.007
	(0.54)	(0.56)
Observations	5,670	5,670
R-squared	0.023	0.024
Number of firms	1,034	1,034
Firm fixed effects	YES	YES
Year dummy variables	YES	YES

Note: All t-statistics are determined by cluster-robust standard errors at the firm level.

[a] The cutoff value is chosen to maximize the log likelihood of Equation 4, it is 0.2658.

With an alternative measure of performance, AVA, we propose a similar relationship with reallocation. The results in Table 3 support that notion. DIR and first-order coefficients are positive; second-order coefficients are negative. As previously, the respective 95% confidence intervals overlap and are separated by 0. We observe similar results with the piecewise regression with cutoff c[7] chosen at the level that maximizes log likelihood of the regression.[8]

Our results show that fluid, but not hyper-fluid, financial resources allocations are positively correlated with financial performance for firms. Specifically, a DIR (which measures the flow of resource allocation) increase from its mean (0.036) of one SD (0.055) is associated with an

[7] The cutoff is a DIR of 0.3428; note that only 38 (0.67%) observations are greater than that cutoff (see Figure 2).
[8] The preceding results, found in the four total regressions in tables 2 and 3, do not particularly change if we excluded the top and bottom 5% of observations in terms of cash flow movement. That is, the relations are not driven by those firms that see the greatest increase and decrease in cash flow from year to year. Hence, the evidence suggests we are capturing a relation that concerns reallocation of resources, not initial allocation.

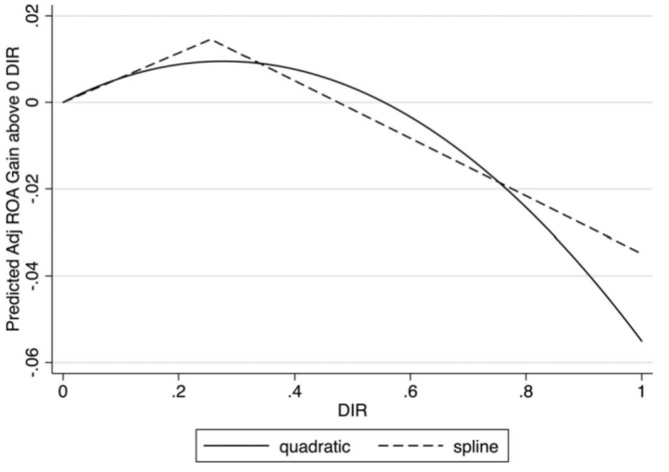

FIGURE 1 Predicted Adj. ROA gain above 0 DIR by DIR. The regression models in Equations 3 and 4, Table 2, predict an inverse U-shaped and inverse V-shaped relation, respectively, between Adj. ROA and DIR. The two DIR coefficients are graphed in relation to their prediction for Adj. ROA. Equations used are $f(x) = 0.069x-0.124x^2$ and $g(x) = 0.057x$ (if $x < 0.2557$) $+ 0.015–0.066x$ (if $x \geq 0.2557$). Only 170 (1.58%) and 194 (1.80%) observations are to the right of the peak of the respective graphs

industry-adjusted ROA increase of 0.0029 (or 0.29 percentage points). For the average Fortune 500 company with assets of $80 billion, this former figure extrapolates to a gain of $232 million per year.[9] A similar calculation (i.e., mean DIR increasing by one standard deviation) would be correlated with an increase in AVA by 0.0033 (or 0.33 percentage points). Since AVA is also a measure of a firm's growth prospects, based on the market value part of Q, which includes growth expectations, we suggest that the ability to redirect resources is associated not only with static measures of financial performance but also with forward-looking ones.

Given the inverse-U (or V) relation between reallocation and both measures of firm performance, a natural question to ask is what percentage of firms are under- and over-allocating. That is, which firms are on the left side of the peak and which are on the right side? Figure 1 displays the implied inverse U/Vs, based on the estimates of the regression models in Equations 3 and 4 of ROA on DIR in quadratic and piecewise form. Figure 2 displays the implied inverse U/Vs, based on the estimates of the regression models in Equations 3 and 4 of AVA on DIR in quadratic and piecewise form. The two graphs show the same pattern. Nearly all firms (98–99%) have DIR below what the regression model predicts is the inflection point with

[9] Under conservative assumptions this translates into an increase in average company value of about $5 billion.

respect to ROA. An even larger number (>99%) is below what the regression model predicts the inflection point to be with respect to AVA. Despite the predicted complex relationship, for the vast majority of firms, the model predicts that greater reallocation is correlated with higher performance. Only a small percentage of companies drive the negative coefficient on the squared term, which means the vast majority of companies are at a level where more reallocation is associated with positive firm performance. This has serious managerial implications, which we discuss below.

Next, we look at how robust these results are across industries. Because separating results from different industries reduces the data's statistical power, we restrict our regression to four of the larger industries in our data: the mining, manufacturing, retail, and wholesale sectors (Table A1). Under each of our four regression modes under both dependent variables, we generally observe an inverse U-shaped (or inverse-V shaped) relation between asset allocation and firm performance. In almost all cases, nearly all of our firms fall on the left side of the inflection

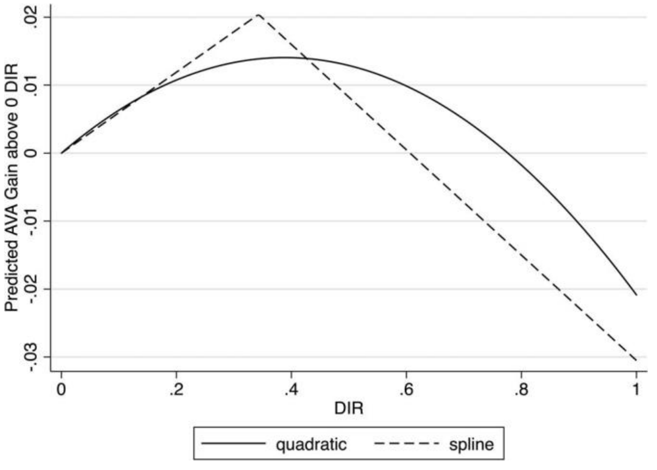

FIGURE 2 Predicted AVA gain above 0 DIR by DIR. The regression models in Equations 3 and 4, Table 3, predict an inverse U-shaped and inverse V-shaped relation, respectively, between AVA and DIR. The two DIR coefficients are graphed in relation to their prediction for AVA. Equations used are $f(x) = 0.072x-0.093x^2$ and $g(x) = 0.116x$ (if $x < 0.2658$) + $0.031–0.061x$

(if $x \geq 0.2658$). Only 27 (0.47%) and 38 (0.67%) observations are to the right of the peak of the respective graphs

point. That is, they are at a level where more reallocation is positively correlated with firm performance, consistent with what was observed for our entire sample (see earlier).

5 DISCUSSION

The reallocation of fungible resources, such as financial capital, can perhaps be measured more accurately than other resources. We began by showing that capital reallocation is a stable characteristic of firms rather than just a response to environmental contingencies. We then offered evidence of an inverted U-shaped (or V-shaped) relationship between reallocation flexibility and firm performance (using two distinctly different measures), thus providing empirical data consistent with Winter's (2003) conjecture about the trade-off between benefits and costs when firms exercise capabilities. However, because this result is found on a very small percentage of companies, it is empirically meaningful but may not be managerially important at current levels of reallocation.

Our article was partially motivated by the observation of the great disparity in the number of metrics available to evaluate a firm's performance in a financial market versus its own capital market performance.[10] While we introduced a measure, DIR, an additional avenue of research could investigate other measures of ICMs that might help us understand firm performance. For example, borrowing from Williamson (1985), it would be interesting to generate firm-wide measures of asymmetric information and misplaced incentives.

The results raise the question of how organizational processes can increase the flow of financial capital. Future research could explore the antecedent organizational factors that lead to higher levels of resource allocation flow and efficiency. A number of studies have addressed potential moderators of capital allocation efficiency—that is, the ability of internal capital markets to direct investment toward deserving projects/units. Thus, increased managerial ownership (Scharfstein & Stein, 2000), lower variance in the relative performance of the firm's business units (Arrfelt et al., 2013), increased relatedness among those units (Rajan et al., 2000; Villalonga, 2004), and exogenous credit shocks that raise the firm's financial constraints (Kuppuswamy & Villalonga, 2015) have all been found to be positively correlated with allocation efficiency. Whether such moderators have a similar impact on resource allocation flow constitutes an interesting subject for further inquiry. Given that the dynamic capabilities framework inspired this article, it would be also be interesting to see if there is a link between specific capabilities and resource allocation flow. Below we discuss specific managerial actions that we view as synonymous with firm capabilities or, at least, aspects of an overall resource allocation capability (Helfat & Maritan, 2019).

Relatedly, a key determinant of whether organizational architectures are better suited for strong reallocation capabilities is the extent of the entrepreneurial culture within management. For example, the level of control that top managers can exercise over those allocation processes (e.g., centralized vs. decentralized processes, discretionary budgets, etc.) will have a significant impact on the flow of those allocations. Organizational slack (Argote & Greve, 2007), particularly financial slack or excess cash, has been associated with higher levels of innovation and

[10] Given that we restricted our empirical analysis to capital allocations across business segments, the study of other datasets could provide opportunities to explore how R&D expenditures, operational expenses, and human capital resource reallocations impact performance. Such research could enrich understanding of the role and importance of managers in the economy. If managers of established companies invest for the long run and make good big bets (e. g., IBM's 360, Boeing's 747, Apple's iPhone), they may be able to ensure periods of prosperity.

entrepreneurship within a firm (Baker & Nelson, 2005; Nohria & Gulati, 1996), as well as with higher levels of investment (Fazzari, Hubbard, & Petersen, 1988) and new product introduction (Natividad, 2013). Recent studies (e.g., Bates, Kahle, & Stulz, 2009) have revealed that firms that operate in more uncertain industries tend to hold more cash, as do firms with more intensive R&D activity. These results suggest that excess resources might provide firms with added flexibility and thus positively affect their ability to reconfigure their portfolio.

On the other hand, Arrfelt et al. (2013) show that higher financial slack leads to a decrease in overinvestment in underperforming units, which the authors interpret as a result of managers worrying less about units with excess resources and thus directing less investment to try to fix them. Conversely, the same authors show that higher financial slack leads to a decrease in underinvestment in over-performing units, which they interpret as managers being less constrained to use resources from better-performing units to fix the worse-performing ones or to try to diversify the risk of the firm's portfolio. Therefore, it is likely that while higher levels of financial slack provide the means to be flexible, they also reduce incentives to shift resources across business units. Given that excess resources have traditionally been perceived as playing an important role in the theory of the firm (Cyert & March, 1963; Penrose, 1959), we suggest they might also play a key role in the efficiency of the firm's resource-allocation processes.

Regardless of organizational structure, these results further enhance the importance of understanding dynamic capabilities at a micro level. Although managers make some asset orchestration decisions on a discretionary basis, the vast majority of resource allocation decisions (e.g., capital expenditures, R&D investments, operational expenses, etc.) are driven and informed by various formalized and periodic resource allocation methodologies and processes (Bower, 1970; Bower & Gilbert, 2005; Bromiley, 1986; Noda & Bower, 1996) at both the program and the project level. These processes can either aid or abet decision making and entrepreneurial efforts. One form of dysfunction is what Williamson (1975) refers to as program persistence, whereby resources are allocated in a path-dependent way to existing programs, starving new programs for resources. Past allocation decisions often have an outsized influence on the present. Program persistence is closely related to inertia. Fully one-third of companies in the U.S. economy barely reallocate across segments; the correlation is .99 from year to year, and the mean reallocation correlation is .93 (Hall, Lovallo, & Musters, 2012). Clearly, ICMs are more rigid than financial markets. The bias toward program persistence or inertia is overdetermined (Bower, 1970; Hall et al., 2012; Penrose, 1959; Teece, 2009).

Anchoring (Tversky & Kahneman, 1974), sunk cost fallacies (Arkes & Blumer, 1985), the statusquo bias (Samuelson & Zeckhauser, 1988), and escalation of commitment (Heath, 1995; Staw & Ross, 1993) are just a few of the cognitive factors that perpetuate program persistence and make resource reconfiguration difficult. Even when managers are capable of adjusting their cognitive frames, they may lack incentives to do so (Kaplan & Henderson, 2005). Political struggles and opportunistic behavior can compound the inertia problem (Bardolet, Brown, & Lovallo, 2017; Brass, 2010; Glaser, Lopez de Silanes, & Sautner, 2013). As a result, firms' allocation processes can be marred by high levels of structural inertia (Tushman & O'Reilly, 1996) that severely constrain the "ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 516). Examining how companies can overcome inertia is an important area of future research.

Viguerie, Smit, and Baghai (2008) posit that executives too often allocate resources at a very general level (i.e., among business units), which leads to inertia, instead of adopting a more granular view that would allow them to identify valuable projects across divisions, independent of their business unit's average prospects. To do so, a company's CFO and financial planning and analysis group (FP&A) must have an independent view of the granular prospects below the business-unit level. Studying the specific heuristics and biases in resource-allocation processes could reveal another interesting set of factors that might influence reallocation. For instance, a widespread anchoring bias in the firm's allocation decisions would result in higher levels of resource inertia (Hall et al., 2012). On the other hand, learning how to integrate simple heuristic rules into resource-allocation processes might facilitate reallocation flow. For example, Exxon Mobil's capital-allocation process requires top management to identify a fixed percentage of the company's assets for potential disposal every year (Hall et al., 2012), which facilitates the pruning of nonstrategic investments. Similarly, managers can combat the natural tendency to anchor (Tversky & Kahneman, 1974) on past allocations by incorporating additional sources of information, such as competitive benchmarks or outside-view estimates (Kahneman & Lovallo, 1993; Lovallo & Sibony, 2014) to the allocation process (Hall et al., 2012). All of the specific practices above and more are the kinds of specific dynamic capabilities that impact and make up an overall resource allocation capability (Hall et al., 2012; Teece, 2007).

6 CONCLUSION

In recent years, the strategic management field has experienced an important shift in the perception of a firm's advantage, from an emphasis on accumulating resources to an emphasis on strategically and entrepreneurially reconfiguring and redirecting resources in response to changing market conditions and technological opportunities and threats. In particular, the dynamic capabilities framework emphasizes that when it comes to longer run financial performance, doing the right things is at least as important as doing things right. In this paper, we find a generally positive correlation between firms that reallocate more capital internally on a yearly basis and firm performance. We also show that extreme reallocation is associated with negative firm performance, though the result applies only to a very small percentage of firms.

While we speculated that these results may vary across industries, when we restricted our regression to four of the larger industries in our data—mining, manufacturing, retail, and wholesale sectors (Table A1)—we saw little difference from the aggregate results. Generally, we observe an inverse U-shaped (or V-shaped) relation between asset allocation and firm performance.

Our results, while correlational, are consistent with the notion that managerial discretion improves performance (Chandler, 1990; Teece, 1993). This finding is at odds with three-quarters of a century of predictions from agency theory and financial economics, which suggests that the more managers' hands are tied by burdensome financial leverage, the better shareholder returns (and economic efficiency) will be (Jensen, 1989). Our results question agency-theory prescriptions that would have management so shackled by debt service that they would have little cash to reallocate to new businesses and would instead have to return with regularity to the capital markets to garner the financial resources needed for growth. Though other causal relationships are possible, our suggested interpretation of our findings is that dynamic internal resource-allocation improves financial performance, as measured by return on assets.

Financial and economic theories have dramatically underplayed the role of managers in capital allocation and reallocation. The manner in which firms deploy internally generated and externally sourced capital deserves much more attention. Doing so will inform how we understand the function of managers in the economy, as well as the success and failure of individual firms.

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APPENDIX A1: Reallocation and industry-adjusted ROA, AVA in four major industries

Dependent variable: ROA			
		Quadratic	Spline
Industry\Model	Obs	Relation	Relation
Mining	507	Inverse-U 91/9[a]	Inverse-V 93/7
Manufacturing	6,259	Inverse-U 95/5	Inverse-V 99/1
Wholesale	578	Inverse-U 99/1	Inverse-V 100/0
Retail	417	Inverse-U 98/2	Inverse-V 74/26
Overall	10,777	Inverse-U 98/2	Inverse-V 98/2

Dependent variable: AVA			
Industry\Model	Obs	Quadratic Relation	Spline Relation
Mining	254	Inverse-U 100/0	Positive -
Manufacturing	3,799	Inverse-U 98/2	Inverse-V 100/0
Wholesale	303	Inverse-U 100/0	Inverse-V 97/3
Retail	236	Inverse-U	Inverse-V

		100/0	98/2
Overall	5,670	Inverse-U 100/0	Inverse-V 99/1

a
Percentage of data below inflection point/above inflection point.