Agency theory and slack resources: A Penrosean analysis of innovation strategy

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Abstract

Starting from roots in the Austrian school of economics, Edith Penrose's work rejected some of the key assumptions of neoclassical economics. She argued that firms are heterogenous and that they each rely on an idiosyncratic bundle of resources in order to invest and grow. Over the years, many scholars have traced the resource-based view of the firm to her work, while a significant number dispute the extent of this intellectual connection. Her work also raised many questions that remain core to this day. In this essay, we describe the precise nature of Penrose's unique contribution and how it has been modified and improved over time in the specific context of innovation strategy. We develop an analytical model integrating her insights with agency theory. In so doing, we demonstrate that agency theorists' advocacy of strong corporate governance (to curb managerial opportunism) and minimization of slack have opportunity costs. These costs arise as restrictions on managerial freedom of action and access to liquid resources may simultaneously inhibit innovation efforts.

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Introduction

Neoclassical economic theory was (and to a large extent, still is) largely concerned with the nature of equilibrium – its existence, stability, welfare properties and so on. Disequilibrium phenomena are typically studied only as means of developing a deeper understanding of equilibrium. Ever since the late nineteenth century, Austrian School economists (e.g., Menger, von Mises, von Bohm-Bawerk, Schumpeter, von Hayek, and many others) have contended that this emphasis on equilibrium is misplaced, since the economies and markets are in a continual state of disequilibrium. Hence, they argue that the study of disequilibrium should appear center stage in economics, with the analysis of equilibrium used simply a means of understanding its nature.

In the 1920's, Fritz Machlup wrote his doctoral dissertation at the University of Vienna under the supervision of von Mises and von Hayek, and it was under his supervision that Penrose did her own doctoral work at Johns Hopkins between 1947 and 1951. This Austrian influence clearly shaped her thinking (Foss, 1998, 1999). One of the fundamental tenets of *Theory of the Growth of the Firm* (hereinafter *TGF*) is that firms are continually in a state of disequilibrium. This implies that it is far more important to study the process of how they evolve through time, rather than any notional equilibrium state – which is never achieved in any case.

A second tenet underlying Penrose's work is a Schumpeterian emphasis on the importance of individual agents. Just as Schumpeter highlighted the role of the individual entrepreneur as the progenitor of his famous "gale of creative destruction" (Schumpeter, 1942: 84), so Penrose argued that "the growth of firms is connected with the attempts of a particular group of human beings to do something" (Penrose, 1959a:

2). Rather indirectly, it is this tenet that has inspired the resource-based view of the firm, though the precise link has been the subject of a robust debate. She argues that an essential requisite for successful firm growth is management oversight. Further, these specialized human resources are often non-replicable, so that they become the ultimate limiting factor on short-run firm growth.

Taken together, these two tenets allow us to understand not only the foundations and development of her own work, but also her influences, initially on economics and later on the field of management. In this paper, we do two things. First, we look backward and trace the roots of many theories that currently influence the work of management scholars to her work. These include the resource-based view (Lockett and Thompson, 2004; Lockett, 2005), key precepts underpinning the theory of transaction cost economics (Williamson, 1973; 1975), and the importance of managerial bandwidth (Bouquet and Birkinshaw, 2008; Meyer *et al*., 2011). Second, we look forward and suggest avenues for future research that are arise from and are inspired by her ideas.

We have structured this short essay in three sections. In the first, we briefly survey the intellectual landscape at the time Penrose wrote *TGF*, relating her work to contemporaries who also challenged orthodox economics. In the second, we examine the manner in which Penrosean ideas have been incorporated into the building blocks of management, pointing to some of the debates that continue to rage to this day. We examine and assess the work of several critics who charge that a great deal of research in strategic management is based on a flawed (or at least a rather optimistic) interpretation of her work. In the final section, we draw together insights that arise out of *TGF*, though not directly based on it, and integrate them with agency theory to develop a model that

furthers our understanding of innovation strategy. Our propositions provide a research agenda for empirical research in both business strategy and innovation management.

Penrose and contemporaneous work

In the 1950s, when Penrose was working on research that would eventually lead to her seminal book, the extant orthodoxy in economics (and to a surprising extent, still present today) held that in equilibrium all firms were identical, treating deviations away from such identity as disequilibrium phenomena. Therefore, these were temporary aberrations. In general, economists in the 1950's regarded firms as black boxes efficiently turning inputs into outputs.[1] Penrose challenged these key tenets of orthodox "neoclassical" economics.

She was a pioneer in her thinking; and she was joined by two other monumental research efforts of the period that also challenged orthodoxy (Cyert and March, 1963; Marris, 1964). While each of these three works had a distinctive approach, they all shared the recognition that far from being simple arrangements that could be represented by production functions, firms are complex organizations run by fallible, self-interested managers. Cyert and March (1963) focused their attention on how managers' self-interest as well as their systematic biases affected a wide range of firm outcomes, including profits.[2] In contrast, Marris (1964, 2002) like Penrose,

[1] We recognize that Coase (1937) explained that firms exist because there is a positive cost of using the market system, whereas the neoclassical model assumed that these costs are zero. Regardkess of whether we consider a Coase a neoclassicist and whether the neoclassical model is able to explain the existence of firms – Demsetz (2011) argues that it can – the state of the art in economics at the time Penrose was working on *TGF* did not recognize firm heterogeneity as an equilibrium outcome. It is also important to recognize that Coase's work did not become mainstream in economics until the 1970's, when Williamson (1975) used his insights as fundamental building blocks in the new field of organizational economics.
[2] As founding members of the Carnegie School, the intellectual lineage of Cyert and March can be traced directly to the seminal ideas of Simon (e.g., Simon, 1957). This tradition emphasized that "theories that viewed the employee as an instrument and physiological automaton" (March and Simon, 1958: 5) were only a starting point. Understanding organizations required incorporating the subjective decision making

concentrated his attention on firm growth. This was more "classical" in the sense of nineteenth century thinkers like Marx who gave pride of place to dynamic rather than static concerns.

The challenges these scholars posed to neoclassical economics were existential. That may partly explain why they were never fully accepted into mainstream economics. However, the work of Penrose, and Cyert and March in particular, became foundational within the newly rising field of management. Strategic management received a major boost in the 1970s from refugees from the economics specialization of industrial organization. Many strategic management scholars followed this path and absorbed the insights of Penrose and others into the core of their emerging discipline (e.g., Galbraith and Schendel, 1983; Porter, 1985). The key point of departure for strategic management scholars was to regard firms as distinct organizations wherein decisions could only be understood by focusing on the incentives and biases of individual managers. Only through such analysis can we understand the factors influencing the behavior of individuals in organizations and the reasons why they contribute or do not contribute to the objectives of enterprise.

In contrast with the other two, Penrose also applied her ideas to the specific context of the international oil industry. With her long running research into the practicalities of this industry in the Middle East (e.g., Penrose, 1959b; 1960), Penrose engaged much more fully with the economics and management of the multinational enterprise (MNE). In this work she developed research questions that would occupy

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of managers as a basic building block of the theory. It is worth noting that while Simon's path-breaking work and influence was belatedly recognized by mainstream economics (he was awarded the Nobel in 1978), to this day the profession has resisted incorporating his insights into textbook microeconomics.

scholars in the yet-to-be-born field of international business for decades – vertically integrated MNEs, transfer pricing, MNE-government relationships, and many more.

More recent views of Penrose

We will not discuss the manner in which Penrose became linked to the resource-based view of the firm (RBV), as there is an extensive literature on the subject (e.g., see Lockett and Thompson, 2004; Lockett, 2005; Pitelis, 2004; Priem and Butler, 2001; Rindova and Fombrun, 1999 and many others). Suffice it to say that *TGF* has become a "canonical reference" (Cockburn, *et al.*, 2000: 1128) for RBV scholars, and that they mostly proceed from *TGF*'s identification of firm's resources as key elements underlying its growth strategy.[3] Instead, we will proceed directly to more recent critiques of the ideas attributed to Penrose in the mainstream management literature. Not surprisingly, these critiques have drawn ripostes and rejoinders from many of those who have built the theoretical foundations of RBV by linking it to *TGF*.

Rugman and Verbeke (2002, 2004) argue that Penrose's central concern was with firm growth, not rents or profits. This implies that the many scholars who suggest that she anticipated RBV have misunderstood her work. In fact, a careful reading of the seminal papers indicates that the founders of RBV drew limited insights from *TGF*. One of the more notable linkages was "the idea of looking at firms as a broader set of *resources*" (Wernerfelt, 1984: 171, italics added) that have the properties of

[3] The following quotes are representative: "the firm is more than an administrative unit; it is also a collection of productive *resources*" (*TGF*, 1959: 24, italics added); "Having attained a satisfactory and reasonably secure position in its areas of specialization, a firm with *resources* available for expansion over and above those required to maintain its position in those areas may well find that opportunities for expansion into new areas look more promising than further expansion in its existing areas" (*TGF*: 120, italics added).

"heterogeneity and immobility" (Barney, 1991: 101). In all its manifestations, a key component of RBV is that it identifies firm resources as the basis of persistent, superior above-normal firm returns (Rugman and Verbeke, 2002), which is a link that Penrose never made. This view suggests that her contributions were both more heterodox as well as more conventional than is current in the mainstream management literature.

Buckley and Casson (2007) formalize Penrose's analysis and apply the model to explain geographical entry patterns by MNEs. In common with Rugman and Verbeke (2002), they note that the variable of critical interest to Penrose is the firm's growth rate. In their analysis, they focus attention on the essentially dynamic manner in which *TGF* treats average costs. Thus, while average costs in *TGF* are constant with respect to the scale of production, they are increasing in "*adjustments* in the rate of output" (Buckley and Casson, 2007: 153, italics in original). In some ways, this analysis is simpler than the textbook neoclassical model, since it specifies static average costs to be constant. But in other ways, it is far more complex, since it specifies a dynamic cost function. Integrating *TGF* with their own work, Buckley and Casson (2007) point out that while Penrose traced geographical expansion to product diversification, they based it on technological innovation. They argue that while the *TGF* "offers a superior account of internationalisation, the Buckley and Casson model offers a superior account of innovation and R&D" (Buckley and Casson, 2007: 170).

Both theoretically and practically, product diversification and technological innovation are intimately connected. While there are many ways to build this complementarity between *TGF* and Buckley and Casson (1976), we suggest that doing so using value chain analysis resonates with strategy research (Porter, 1985). *TGF* is downstream oriented, more concerned with developing markets and sales. Buckley and

Casson (1976) is more upstream oriented, since the main drivers of internalization across national borders are R&D intangibles. Marketing (downstream) and R&D (upstream) intangibles are the two generic forms of firm knowledge (Lev, 2001; Morck and Yeung, 1992). Both theoretical and empirical research has traced value creation in MNEs to their ability to generate such intangible knowledge (Morck and Yeung, 1991). Putting *TGF* and Buckley and Casson (1976) together, we can see that MNE value creation within a supply chain is concentrated at the upstream and downstream ends (Mudambi, 2008). Further, these two generic forms of knowledge are the basis for geographic expansion and foreign market entry (Denis and Depelteau, 1985; Hill and Hult, 2019).

The way forward: A Penrosean model of innovative activity

Written at a time when most business disciplines were either nascent or yet to be born, the insights in *TGF* do not fit neatly into any one of the current silos within the business school. Given the narrowing scope of much modern business scholarship, refreshing the links to *TGF* can point the way to new, holistic insights. This is the objective of this final section of this essay.

There are two critical components of *TGF*, each of which can be seen at the root of a major body of current literature. The first is the analysis of firm slack resources (i.e., those resources that are above those required to sustain the basic operations of the firm). This is at the very heart of most of continuing debates with regard to agency theory within the firm. The second relates to managers' individual motivations wherein *TGF* anticipates, albeit in rather non-technical form, many of issues that occupy scholars who study the firm's microfoundations (e.g., Felin, Foss and Ployhart, 2015).

TGF pays a great deal of attention to slack resources that are specified to be one of the most important bases upon which firms can earn returns and thereby finance growth (Pitelis, 2007). Relative to traditional economic theory, Penrose reversed the objectives of the firm's managers. Managers' objective in traditional theory is profit maximization, and firm growth is simply a means of achieving this ultimate goal. In *TGF*, slack resources are simply a means of achieving growth.

The analysis of slack in *TGF*, particularly unabsorbed slack (i.e., highly liquid spare resources) anticipates a major debate in business scholarship. More recent scholars have a much more pessimistic view of managers' use of available slack. The free cash flow theory (Jensen, 1986) as well as the literature on the conglomerate discount (Amihud and Lev, 1981, 1999) suggest that these resources would be used to pursue managers' own interests at the expense of the interests of shareholders. In other words, while *TGF* sees slack as an important basis for firm growth, agency theorists see it as a vehicle through which managers pursue self-interest.

A partial resolution of these divergent views may be found in Nohria and Gulati (1996) who study innovation – a key channel through which slack engenders firm growth in *TGF*. They hypothesize an inverted U-shaped relationship between slack and innovation. Too little slack constrains innovative activities by imposing a budget constraint that is so tight that it limits that the experimentation necessary to explore the potential of new ideas (Mudambi and Swift, 2014). Too much slack results in "diminishing discipline over innovative projects" (Nohria and Gulati, 1996: 1245), an argument that is congruent with and exacerbates the agency problems arising from the free cash flow theory.

The confidence that *TGF* reposes in the positive use of slack by managers stems from Penrose's confidence in the working of competitive markets. External competitive pressure naturally reduces intrafirm conflict as it binds managers' interests in preserving their employment more tightly with shareholder's interests in avoiding bankruptcy and the loss of their invested capital (see Pitelis, 2007, especially Figure 1). Thus, while *TGF* may explain the upward sloping portion of the inverted-U shaped curve in Nohria and Gulati (1996), agency problems combined with managerial bandwidth issues (Meyer et al., 2011) may explain the downward sloping portion.

Nohria and Ghoshal's (1996) broadening of our understanding of slack provides a useful starting point from which to build new theory based on Penrosean insights. We base our analysis on two important insights of *TGF*: the roles of (a) slack and (b) managers' self-interest in the firm's innovation efforts (and consequently, its growth). We develop these insights within an agency framework (Williamson, 1973; 1975) to build a holistic model that combines managerial decision-making with firm characteristics to provide a theoretically robust understanding of the Penrosean imperative of firm growth.

Agency theory, corporate governance, and slack resources

Before offering our propositions, it is important to describe our units of analysis. We offer propositions that describe the tension between shareholders and all levels of management. In addition, we offer predictions of how firms traded on U.S. stock exchanges react to increases in the strength of corporate governance, which increase shareholder rights at the expense of other firm stakeholders.

Despite compelling evidence that risky R&D investment drives up firm value (Hall et al., 2005; Mudambi and Swift, 2014), a common view since the 1990's is that

investors are myopic (Hansen and Hill, 1991). Any benefits that may be created from R&D investment are highly uncertain, and will be realized in the distant future (Bernardo, Cai and Luo, 2001). The cost of investing in innovation is incurred immediately, leading to lower current firm performance; inferior firm performance can lead to firm takeover (Shleifer and Vishny, 1989), and this pressure lead firms to reduce investments in long-horizon projects whose returns are highly uncertain in order to increase investments that are less productive but more likely to yield short-term results (Muelbroek et al., 1990). Stein (1988) observed that stockholders do not have full information on firm prospects. As a result, temporarily reduced earnings from R&D investment can lead to undervalued stock prices, which increases the likelihood that the firm will be required at an unfavorable price (p. 61). This paper focuses on the tension between *shareholders* and *managers* who are more likely to understand the reasons that the firm must invest more in R&D.

Prior scholarship has evaluated governance using two different units of analysis. Some research has evaluated the relation between country or market level corporate governance systems and R&D-based innovation. For instance, Tylecote and Ramirez (2006) found that country-level shareholder-oriented governance systems lead to radical forms of innovation that maximize long run shareholder value, while stakeholder-oriented country systems induce firms to take fewer risks, leading to incremental innovation.

Researchers who evaluate country, or market governance systems embrace a concept of governance that is quite broad. Many of these studies consider nine aspects that describe an "insider dominated" vs. an "outsider dominated" governance and financial system at the country level. This framework considers the liquidity of financial

markets, the concentration of ownership of the firm, the investment strategies of shareholders, and the role of government regulation. All of these drivers are outside of the corporate governance framework that we employ in this paper. While we consider only the legal aspects written into the corporate charter of a firm whose shares are traded on U.S. stock exchanges (Gompers *et al.*, 2003), Tylecote and other's frameworks consider a diverse set of social, regulatory and economic influences on firm governance, and the strategies that those firms pursue. Thus, our unit of analysis is the firm, while Tylecote and other's unit of analysis is the market, or country.

One of the most salient implications of agency theory is that corporate governance characterized by stronger shareholder rights is a good thing. We need look no further than the corporate scandals that are regularly uncovered to get a sense of the social cost of weak governance.[4] The impact of poor governance is not isolated to high-profile stories. Firms use staggered boards to insulate board directors from removal due to a hostile takeover; this practice causes an "economically meaningful reduction in firm value" (Bebchuk and Cohen, 2005: 409). Another perspective is that stronger corporate governance (i.e., stronger monitoring or shareholder rights) dampens corporate innovation, since R&D spending often reduces firm profitability in the short-run (Driver and Guedes, 2012). Firms with weaker immediate profit performance are more likely to be acquired, and weaker corporate governance shields management from this market discipline (Faleye, 2007). Thus, in the presence of stronger corporate governance, managers are more incented to sacrifice long-term performance in order to maintain

[4] Prominent examples include Enron, Worldcom, Vivendi and Parmalat. Enron shareholders lost $74 billion, of which $40 to $45 billion was attributable to fraud (Axtman, 2005). Ineffective corporate governance is among the causes of the Enron debacle (Healy and Palepu, 2003).

higher short-term market valuations of the firm. Indeed, stronger corporate governance reduces many forms of firm innovative behavior, both on the investment side (R&D intensity) (Honoré *et al.*, 2015), and on the output side (patents and patent citations) (Becker-Blease, 2011).

Another reason that stronger corporate governance stifles innovation relates to the inability of shareholders to monitor innovation effectively. As we noted above, any benefits from R&D investment are highly uncertain, and temporally distant (Bernardo, Cai and Luo, 2001), while the cost of investing in innovation is incurred immediately, leading to lower current firm performance (Shleifer and Vishny, 1989). Stein (2003) adds that when firms are dealing with intangible assets such as R&D, it is difficult to compel project managers to truly disclose the prospects for long-run projects because shareholders do not have currently available data that can be used to evaluate or refute their claims. Entrenched managers can thwart firm efforts to understand the quality of the firm's R&D projects.

This "managerial myopia" (Stein, 1988) can be mitigated. Firm-level incentive systems that tolerate failure will increase innovation (Holmstrom, 1989). Career protection for managers also can boost firm innovation (Aghion, Van Reenan and Zingales, 2013). An important requirement to achieve this outcome is resisting short-term earnings pressures from analysts and investors (Zona, 2016).

One way to evaluate management's appetite to pursue relatively risky policies is to observe the extent to which the firm exhibits compact, significant shifts in R&D spending (Swift, 2016). Compact, significant shifts in R&D spending disrupt the innovation processes within the firm (Dierickx and Cool, 1989; Grabowski, 1968; Kor and Mahoney, 2005), and represent a major form of organizational change (Barnett &

Freeman, 2001). We argue that such strong moves carry significant employment hazard in environments characterized by strong oversight of managers, since they "run the risk of being fired if firm performance falls off" (Hambrick and Mason, 1984: 202). For instance, the presence of a greater number of outside directors on the board, a common metric of stronger corporate governance, has been shown to reduce managers' propensities to undertake risky projects (Zahra, 1996).

Since a shift in investment is relatively risky, firms under less pressure from stakeholders should be more likely to take these risks. We posit that the magnitude of compact significant shifts in R&D spending indicates the extent of this type of risky behavior. Therefore, managers that operate under a regime that tolerates more risk should be more likely to make these big changes. If looser governance incents managers to pursue uncertain prospects due to reduced employment risk, then we should expect that firms with weaker governance provisions undertake bolder shifts in R&D expenditure. This leads to our first proposition:

P1: The magnitude of compact, significant shifts in firm-level R&D expenditure is negatively related to the strength of corporate governance.

We build on our first proposition to offer a second, complementary proposition. Since Penrosian theorists assert that the firm has unique incentives to re-invest resources into itself, we predict the firm will have a "bias" towards reinvesting in itself, whereas neoclassical economists will consider more rigorously whether shareholders should remove that excess cash from the firm in order to prevent managerial malfeasance.

RBV theorists argue that unabsorbed organizational slack is a uniquely valuable asset that can be quickly deployed in a wide variety of uses by firm managers who have

proprietary domain expertise that enables them to invest that free cash within the firm more wisely than the external market can invest it (Barney, 1991). Thus, such slack resources that exist in a firm with strong innovative capabilities "is likely to be a valuable, unique, and hard-to-imitate capability that has strong performance implications" (Tan and Peng, 2003: 1260).

Both neoclassical economists and Penrosian theorists are rational, and both evaluate the tradeoff between investing excess resources into the firm against returning those resources to shareholders. The fundamental difference between the two arises from a key Penrosean departure from orthodoxy – firm heterogeneity. Since each organization is a unique bundle of resources, the value of excess resources varies across firms. *TGF* argues that only firm managers have the proprietary domain expertise required to invest resources in the firm, and that the combination of domain expertise and cash can produce valuable, rare, inimitable and operationalizable (VRIO) capabilities within the firm. In short, our framework suggests that the agency theorists' focus on curbing slack in order to limit managerial opportunism is not costless. The cost appears in the form of foregone innovation opportunities.

Neoclassical economics compares the marginal benefit of funneling cash to shareholders vs. investing that cash back into the firm. *TGF* does the same. By definition, organizational slack are resources in excess of those required to sustain the operations of the firm (Bourgeois, 1981). Thus, since these resources are 'excess', neoclassical economists would recommend removing these resources from managerial discretion. However, we suggest that, *ceteris paribus*, Penrosian theorists believe that,

up to a point[5], investing organizational slack in particularly risky forms of R&D-based innovation generates more VRIO competitive advantage than neoclassical thinkers.

Increasing firm-level R&D expenditure requires the firm to inject significant resources into the firm's innovative processes at irregular intervals. Firms can maintain relatively low R&D expenditure while industry conditions are stable, but must increase R&D spending significantly during the infrequent but challenging periods of extreme change, which arrive unpredictably (Romanelli and Tushman, 1994).

R&D outcomes also are impossible to predict. Innovation has been characterized as a perfect example of Knightian uncertainty, as agents have different expectations about its potential (Teece, 2017). When firms ramp up R&D spending significantly, they must invest internal resources in these endeavors, because such speculative initiatives do not appear viable to outside investors (Aboody and Lev, 2000). Firms that do not have the necessary resources on hand may be unable to ramp up R&D at the appropriate times and miss promising opportunities. These behaviors can be significantly detrimental to firm performance.

As noted in *TGF*, organizational slack generally refers to the quantity of resources available to the firm that is greater than the level required to run its routine operations. Higher levels of organizational slack enable the firm to fund R&D activities during operating shortfalls, thereby avoiding the cancellation of R&D projects that would otherwise occur (Bromiley, 1991).

If organizational slack provides the resources required for expensive changes in R&D investment, and to insulate the firm from the inherent riskiness of R&D

[5] A common view is that an optimal level of organizational slack exists, and that excess levels of slack are a bad thing (Nohria and Gulati, 1996).

investment, then we expect firms that hold higher levels of available slack undertake more aggressive changes in R&D spending. This leads to our second proposition:

P2: The magnitude of compact, significant shifts in firm-level R&D expenditure is positively related to the level of organizational slack held by the firm.

Concluding Remarks

In the years since its publication, *TGF* has significantly influenced the field of strategic management. It is well known that Penrose's central concern was dynamics, i.e., the growth of the firm, and that she analyzed pathways through which this could occur. She posited that innovation enabled the firm "to use its existing *resources* more efficiently" (*TGF*: 74a, italics added) and that the firm's innovative effort is "not haphazard, but closely related to the nature of existing *resources* (including capital equipment) … and becomes therefore, an important part of the explanation of the growth of firms …" (*TGF*: 74b, italics added). Thus, according to Penrose, innovation is a crucial modality through which firms grow.

In our analysis, we have built on her original insights to suggest that there is a trade-off between two internal drivers within the firm: managerial subjective decision-making and available slack. In the decades since Williamson's (1975) seminal work, agency theorists have built up a large body of research in which they argue that available slack tempts managers to behave opportunistically. This literature recommends that (a) managers be stringently monitored (agency theory) and/or available slack be kept to a bare minimum (free cash flow theory) to prevent such opportunism.

In this essay, we counter that the pendulum may have swung too far. Monitoring managers is not costless and the costs can far exceed direct monitoring expenses.

Eliminating available slack is not costless either. Both of these policies can reduce the firm's innovative efforts. However, since the costs of managerial opportunism can be estimated with some precision, while the costs of foregone innovation are largely hypothetical, empirical evidence is likely to favor constraining managers. Our closing argument is that in many contexts, especially with the increasing pace of technological advance, the costs of forgone innovation can far outweigh the benefits of managerial constraints.

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