Firms often forego business opportunities that necessitate significant change. But, why are firms so rigid?
We develop a general framework to disentangle age-based rigidity mechanisms based on each mechanism’s implications for firm performance in periods preceding and following strategic change. Analyzing longitudinal data on 8,887 hedge funds raised by 2,781 firms between 1994 and 2005, we find a strong negative relationship between expanding the horizontal scope of the firm by launching a new fund (“diversification”) and firm age. Furthermore, younger firms outperform older firms both prior to and after diversification. The evidence implies that rigidity in hedge funds is primarily attributable to internal political constraints and less to constraints associated with exchange partner obligations or diminished operational capabilities. We conclude by discussing how our general framework applies to contexts in which the primary constraint on strategic change may differ.

1. Introduction

Why do firms struggle with strategic change? Scholars have long noted that rigidity limits firm growth, innovation, and performance (Penrose 1959, Leonard-Barton 1992). Yet, rigidity is a rather ambiguous explanation for a firm’s failure to capitalize on new opportunities and to, consequently, perform better. The prevailing wisdom is that most organizations exhibit rigidity, but how to identify the primary constraint on strategic change in any particular context remains a puzzle despite a long line of thought-provoking work on the impediments to organizational change (e.g., Merton, 1957; Cyert and March, 1963; Hannan and Freeman, 1984; Christensen and Bower, 1996).

This paper systematically examines three common lines of reasoning in the diverse literatures that address the tendency of firms to preserve the status quo. Generally, firms may struggle to implement

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strategic change because of obligations to exchange partners external to the firm (e.g., investors, customers, suppliers), internal politics that constrain decision making, or internal operational constraints on implementation. A common thread in prior work is the idea that each of these three sources of rigidity is increasing with firm age; obligations, politics, and routines, all solidify as firms age. Building on, and extending these ideas, we develop a general conceptual framework that links age, change, and firm performance. In particular, our model makes distinct predictions about firm performance before and after a strategic change, enabling one to identify the primary locus of constraint on change in a wide variety of settings.\footnote{Our inquiry focuses on age-based determinants of rigidity, but one could similarly apply our conceptual framework to examine the mechanisms underlying other major sources of rigidity (e.g., size-based determinants).} We first derive these distinctive signature effects conceptually. We then empirically analyze the sources of rigidity—and their relationship to firm age—using a detailed data set on 8,887 hedge funds offered by 2,781 hedge fund firms between 1994 and 2005. In particular, we study scope expansion (“diversification”) as the strategic change of interest.

We document a negative relationship between organizational age and horizontal scope expansion, a necessary prerequisite to testing more specific hypotheses motivated by mechanism-based rigidity accounts. We then distinguish between external and internal constraints on strategic change by focusing on \textit{ex ante} performance (i.e., performance prior to implementing a strategic change). Perhaps because hedge funds are inherently ambiguous organizational forms (Smith, 2011), the results are inconsistent with the idea that age-based obligations to exchange partners external to the firm are the primary driver of hedge fund rigidity. Older diversifying firms actually exhibit lower \textit{ex ante} performance than younger diversifying firms, which implies that exchange partners’ standards of demonstrated performance are lower for older diversifying firms than for younger diversifiers. Thus, we infer that, in this setting, the primary constraint on strategic change is internal in nature—either political or operational.

We then evaluate internal constraints on strategic change by focusing on \textit{ex post} performance (i.e., performance after implementing a strategic change). More consistent with political constraints than operational ones, older diversifying firms exhibit lower \textit{ex post} performance, implying that scope
expansion is more likely to entail political compromise within older firms than in younger ones. We infer
from these results that political constraints on strategic change are the primary generator of rigidity in the
hedge fund industry.

Our findings suggest that strategic change becomes less likely as firms age because of the
increasingly political nature of internal decision-making. The idea that firm strategy is strongly
influenced by organizational politics dates back at least to Cyert and March (1963). Yet, the possibility
that aging produces rigidity by increasingly politicizing strategic decisions has received limited attention
in strategic management research (c.f., Christensen and Bower, 1996) or, more generally, work on
corporate governance (Gavetti, Levinthal and Ocasio 2007). We document this relationship in the context
of diversification—one of the most important strategic changes that firms make. Thus, one contribution
of this research is to demonstrate that limitations on firm scope due to rigidity need not be imposed by
markets nor induced by eroding capabilities. Rather, the politics of firm decision-making are sufficient to
constrain firm scope, and indeed, substantially reduce the rate of new product introductions in one of the
most vibrant industries in the modern economy.

A second contribution of this study is to offer a unified framework for adjudicating alternative
explanations of organizational rigidity. Although a central topic in strategy and organizational theory,
most prior research in this area focuses on identifying but a single mechanism (Hannan and Freeman,
1984; Miller and Chen, 1994; Ruef, 1997). Subject to a few basic assumptions, our framework enables
scholars to identify which of several mechanisms primarily constrain strategic change in any given setting
where rigidity increases with age, based on observable performance patterns. We conclude our study by
discussing the applicability of our framework to the study of strategic change in other contexts.

Besides contributing to the literatures on organizational theory and strategic management, this
research has implications for practice as well. Executives in many industries struggle to implement
strategic change due to organizational rigidities that set in over time. This paper offers a blueprint for
determining rigidity’s root cause, which can help managers determine the policy interventions most likely
to be effective for their firms.
2. Theory

Organizational theory informs us that organizational behaviors and outcomes vary systematically with firm age. For example, organizational rates of innovation (Sørensen and Stuart, 2000), growth (Barron, West, and Hannan, 1994), and survival (Ranger-Moore, 1997) all exhibit significant age dependence. Prior work demonstrates that age exerts both positive and negative influences on organizational functioning, but also offers a general consensus that old organizations are less likely to change than young organizations. The theory of structural inertia specifically accounts for this age-change relationship by emphasizing how environmental selection pressures favor organizations that maintain their core features over time (Hannan and Freeman, 1984). Consequently, aging organizations tend to favor exploiting established routines over exploring new ones (Nelson and Winter, 1982; March, 1991).

Organizational preferences for established routines over novel ones suggests that *ceteris paribus* older firms will be less likely to expand their horizontal scope by launching new products because expanding into new activities fundamentally alters “the kinds of clients (or customers) to which the organization orients its production and the ways in which it attracts resources from the environment” (Hannan and Freeman, 1984: 1560). Indeed, the literature on age and change highlights several non-exclusive mechanisms that might produce a negative relationship between age and horizontal scope expansion.

Organizational survival depends upon reliably performing in accordance with societal expectations and accounting rationally for performance (Hannan and Freeman, 1984). Organizations, therefore, institutionalize goals and standardize their activities so that, over time, reliable routines evolve (Nelson and Winter, 1982; Amburgey, et al., 1993). Because routines develop by repeatedly performing activities (Nelson and Winter, 1982), as firms age their routines tend to become more reliable, and, therefore, they face strong incentives to continue exploiting established routines instead of developing new ones (Stinchcombe, 1965; March, 1991). Strategic change is risky because altering goals and routines compromises reliability and accountability and, therefore, tends to reduce performance (Hannan and Freeman, 1984; Desai, 2008). Moreover, changes to core organizational features, such as the breadth of the firm’s product portfolio, are risky not only because the organization’s core routines must be modified
as a result, but also because the basis for market evaluations is altered as well (Zuckerman, 1999, 2000). Organizations, therefore, tend to preserve the status quo, and older organizations change less often than younger organizations (e.g., Delacroix and Swaminathan, 1991; Amburgey, et al., 1993). Prior research on the relationship between age and change implicitly compares the costs of implementing change with the costs of preserving the status quo. We make these comparisons explicit by considering how aging influences the costs of one strategic change: expansion of a firm’s horizontal scope via new product introductions.

Firms expand their scope (i.e., diversify) by launching new products or service offerings. Diversification is of great interest to organizational scholars in its own right because of its implications for growth, performance, and market evaluations (Rumelt, 1974; Montgomery and Wernerfelt, 1988; Haveman, 1992; Zuckerman, 1999, 2000). Recent work casts diversification as typically motivated by expected positive economies of scope borne of cost reductions or revenue enhancements (Campa and Kedia 2002). But, diversification also taxes organizations’ information processing capabilities (Zhou, 2011) and distracts managers from their responsibilities (Schoar, 2002), arguably contributing to a “diversification discount” (Lang and Stulz 1994). In this paper we are particularly interested in new product launches as an indicator of a firm’s propensity to change.

Below, we first consider how rigidity varies with firm age, generating a systematic negative relationship between age and diversification. We then consider three causal mechanisms that could plausibly produce both this outcome and a set of relationships between age and performance.

2.1 Diversification and firm age

Extant research identifies three primary constraints on strategic change: obligations to exchange partners, internal politics, and diminishing adaptation capabilities. Below, we briefly discuss each constraint in turn to highlight common themes and then identify points of distinction among them.

The first type of constraint on strategic change is the necessity of persuading exchange partners that organizational change will be beneficial. With age, firms become embedded in exchange relationships with customers, suppliers, evaluators and others that associate the firm with its established routines and
offerings and often contractually oblige firms to support legacy offerings (Amburgey, et al., 1993; Miller and Chen, 1994; Christensen and Bower, 1996; Argyres and Liebeskind, 1999). New offerings often elicit exchange partner concerns about the firm’s commitment to those who produce and consume the firm’s legacy offerings (e.g., Card, 1986; Phillips, Turco, and Zuckerman, 2013). Firms must assuage these concerns with a compelling change rationale in order to secure the resources necessary for horizontal scope expansion. To the extent that exchange partner obligations grow stronger with relational time, these external constraints on change increase with age.

The second type of constraint on strategic change is the politicization of internal decision making. Bureaucracy develops over time, reducing uncertainty and stabilizing the organizational power distribution (Merton, 1940; Weber, 1947; Cyert and March, 1963; Barron, et al., 1994). But, bureaucracy usually serves the interests of the firm’s most powerful employees by enabling them to allocate resources disproportionately in a manner that allows them to preserve their power (Pfeffer, 1981). Accordingly, disagreements between those who support established routines and those who want to develop new ones often result in employee exits, and the subsequent formation of competing firms (Freeman, 1986; Klepper, 2007). By necessitating ever more political bargains to implement strategic change, bureaucracy increasingly constrains change as organizations age.

The third type of constraint on strategic change is an internal operational limitation. Structural features are difficult to change because firms develop routines over time, which are costly to change (Nelson and Winter, 1982; Cohen and Levinthal, 1990). Such operational constraints make it more difficult for firms to effectively implement strategic change, even when the firm is well aware of the benefits of change. For example, management might recognize that a more diversified set of offerings would be inherently superior in the absence of internal operational constraints, but still forego a new product launch because of concerns about the costs of adapting the firm’s established routines. Because older firms generally utilize more established routines than younger ones, operational constraints on strategic change should be greater for older firms.
Rigidity may, thus, be borne of three constraints associated with external exchange partners, internal politics, and internal operational capabilities. If all three constraints are increasing in magnitude with age, our baseline prediction is that, *ceteris paribus*, the diversification rate is decreasing with firm age.

**Hypothesis 1**: The older the firm, the lower its rate of diversification.

### 2.2 Age, change, and performance

All three accounts of rigidity imply that as firms age their propensities to initiate strategic change will decline. In other words, simply observing rates of diversification does not enable identification of the primary constraint on strategic change. To identify the primary rigidity-producing mechanism we consider the distinct implications of each account for firm performance before and after a change.

Although the theorized relationship between age and diversification is relatively straightforward, the link between age and performance is less so. To elucidate theoretical relationships amongst age, diversification, and performance, we develop a simple formalization of the decision to expand horizontal scope based on two broad precepts. First, we assume that the distribution of returns to new opportunities (e.g., the arrival of new product ideas) does not vary with age, and opportunities are evaluated by risk-neutral decision-makers within the firm on the basis of their expected returns relative to maintaining the status quo. In general, if the expected returns to an opportunity exceed a minimum threshold—a hurdle rate—the organization implements the change; otherwise, the organization maintains the status quo. However, there are important exceptions to the general rule, as we discuss in more detail below.

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2 We start with an assumption that age does not affect the distribution of ideas within a firm simply to provide a sharper test for the mechanisms we explore below. In particular, we show that even if age does not affect “firm creativity,” each mechanism generates a result consistent with Hypothesis 1, in addition to making further predictions about firm performance. If we relax the assumption that age does not affect idea formation within the firm, our results are only strengthened: all of the subsequent analyses hold when the production of new opportunities is exogenously declining with age.

3 Based on our extensive literature review it does not appear that organizations systematically become more risk averse as they age. Our model can be generalized to include risk aversion, but doing so would not change the results or conclusions of this paper.

4 In the threat rigidity literature firms become rigid as a response to performance below aspirations (Staw, et al., 1981; March and Shapira, 1987). Given our first assumption, our model is consistent with this literature—threat rigidity is a rational response to an expected decline in future returns to change, based on observed past performance—though we explicitly consider operational constraints on adaptation more generally below.
Second, we assume that there is asymmetric information about change opportunities between exchange partners and firms. Investors, suppliers, customers, and analysts, for example, lack firm-specific information germane to new opportunities and, therefore, decide whether they will support change based on the focal firm’s observed historical performance. Conversely, executives and their employees assess new opportunities on the basis of expected future returns from such opportunities. From these basic assumptions we generate specific predictions about firm performance before and after diversification events as joint hypotheses that also predict the baseline result that older firms are rigid, which are distinctly motivated by the three theoretical mechanisms discussed above.

### 2.2.1 External exchange partner constraints on organizational change and ex ante performance

Diversifying firms must maintain both contractual (Argryes and Liebeskind, 1999) and social (Granovetter, 1985) obligations with exchange partners, while also developing new relationships necessary to bring new offerings to market. These obligations typically increase with age. For example, executives feel obligated to inform long-time suppliers of impending changes that may adversely affect their business (Uzzi, 1996) and commitments to organized labor often constrain organizational change (Card, 1986; Nickerson and Silverman, 2003). New ventures often capitalize on technological change more readily than established organizations because older organizations allocate resources to appeasing current customers instead of developing products for new ones (Christensen and Bower, 1996). If exchange partner obligations solidify over time, then the external constraints on diversification should be greater in older organizations. This logic implies that the hurdle rate for new projects based on ex ante performance should be higher for older than younger organizations.\(^5\)

To illustrate this conjecture, consider a simple, reduced-form model where there is an “old” and “young” firm, denoted respectively by \(i \in \{o, y\}\). Each firm has a single legacy offering and considers diversification by launching a new offering. The legacy offering has a track record of performance \(r_i\), where track records are distributed according to a normal distribution \(f\) with mean \(\mu_i\) and variance \(\sigma_i\).

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\(^5\) Our interest is in uncovering the mechanism underlying why older firms are rigid. Alternative theories positing the opposite implication of external exchange partner constraints are generally inconsistent with Hypothesis 1.
Profit-seeking firms will seek to diversify in order to allocate fixed costs to a larger number of units. But, such efforts succeed only with exchange partner support.

Exchange partners evaluate a firm’s proposed change opportunity based in part on the performance track record of its legacy offering where the better the track record, the higher the expected performance of the new opportunity (Kaplan and Schoar 2005). Thus, exchange partners support diversification if the firm’s recent performance is sufficiently positive (i.e., it exceeds a hurdle rate).

We denote the hurdle rate that exchange partners apply for each firm \( h_i^a \) where \( i \in \{o, y\} \) and the superscript \( a \) denotes the hurdle is on the \( ex \ ante \) performance distribution. For simplicity, we assume that this hurdle rate always exceeds the mean of the performance distribution — that, at a minimum, new product introduction attempts are made by firms with above-average track records. Figure 1 illustrates this idea, where \( f(r) \) represents the distribution of track records and \( h \) represents the hurdle rate \( h \). Firm decisions are straightforward: launch the new product if \( r_i > h_i^a \).

\[
\begin{align*}
\text{Insert Figure 1 About Here}
\end{align*}
\]

If exchange partners apply a higher standard to older than to younger firms, then \( h_o^a > h_y^a \). This logic motivates a prediction about the relationship between new product introductions and \( ex \ ante \) performance based on age-varying external constraints. For clarity, the indicator variable \( d \) denotes a diversification choice, such that \( d = 1 \) if an organization launches a new product and \( d = 0 \) if not. Namely, we can write the average \( ex \ ante \) performance conditional on diversification as:

\[
E(r_i \mid r_i > h_i^a) = \int_{h_i^a}^{\infty} r_i f(r) dr. \tag{1}
\]

Equation (1) expresses the expected \( ex \ ante \) average performance of a firm that launches a new offering, or the average historical performance of firms whose track record exceeds the exchange partners’ hurdle rates. Given that the normal distribution is single-peaked and \( h_o^a > h_y^a \), Equation (1) implies:
\[ E_a(r_a \mid d = 1) > E_y(r_y \mid d = 1). \]  

(2)

Equation (2) states that the average \textit{ex ante} performance conditional on diversifying will be higher for older firms. Figure 2 illustrates this intuition. The average \textit{ex ante} returns for older firms is the weighted average of performance above the hurdle rate, which is illustrated as the cross-hatched area. Because young firms face lower hurdle rates, the calculation of their mean includes all of the area occupied by older firms and the additional area between the two hurdle rates \( h_o^a \) and \( h_y^a \). Because this area originates at lower performance values for younger than for older firms, the expectation conditional on the hurdle rate is also lower for younger firms if external constraints primarily limit strategic change.\(^6\) These arguments motivate our second hypothesis:

\begin{center}
\textbf{Hypothesis 2:} If rigidity is primarily attributable to external exchange partner obligations, then the \textit{ex ante} performance of older firms that diversify will be higher than the \textit{ex ante} performance of younger firms that diversify.
\end{center}

\[ \text{Insert Figure 2 About Here} \]

2.2.2 Political constraints and \textit{ex post} performance

Internally, organizational decision makers evaluate strategic change opportunities not only on the basis of expected profits but also on the basis of expected changes to their own utility, for example to changes in their intra-organizational status, power, and other non-pecuniary benefits (March and Simon, 1958; Jensen and Meckling 1976, Ocasio 1994). In this sense, diversification decisions are influenced not just by the innate quality of the offering under consideration but also by the vested interests of a firm’s

\[ ^6 \text{Our emphasis on using \textit{ex ante} performance to infer the strength of external constraints does not suggest that internal issues do not affect \textit{ex ante} performance empirically. Rather, our model exploits the information content of forward-looking decisions, by both external and internal stakeholders, to infer the sources of organizational rigidity in firms. While internal constraints may influence \textit{ex ante} performance, they will only influence internal strategic decision-making by changing the hurdle rates the firm applies to expected \textit{ex post} performance. In other words, internal constraints only matter to internal decision-makers if they are persistent, while external exchange partners, who lack inside-information, can only make inferences about firms based on their track record.} \]
decision makers. We refer to internal sources of rigidity driven by hierarchical authority, in contrast to operational considerations, as political constraints on strategic change.

Powerful managers and/or dominant coalitions control resources within firms and can be expected to support established routines that produce reliable results, which perpetuate their power. Although managers’ power bases are typically associated with the firm’s core routines and offerings, powerful managers may support changes that generate private benefits for themselves. For example, Amihud and Lev (1981) demonstrate that managers tend to over-diversify to protect their own careers. Departing from the prior literature on the politics of diversification, we consider how political constraints can contribute to rigidity and under-diversification. In the world of asset management, such politics frequently surrounds new fund launches within a firm. Fund managers, for example, often have an interest in limiting a particular new fund if they believe that it will distract shared resources from their incumbent funds—for example the time and focus of the sales force.

In order to understand the implications of political constraints on the *ex post* performance of old and young firms in the context of diversification, we assume that firms evaluate opportunities based on expected returns and focus on the expected *ex post* performance of a new opportunity. We formalize this idea by assuming each firm generates a single opportunity \( x \), where the expected value of \( x \) is drawn from a normal distribution \( g \) with mean \( \mu_x \) and variance \( \sigma_x \).

As a baseline, consider what would happen if two firms of different ages faced identical opportunities and based their decisions purely on expected returns. In this case, firm decisions would not vary with age: both would implement new opportunities with expected values higher than the hurdle rate (e.g., cost of capital) and reject all others.

Politics influence *ex post* performance by injecting noise into the project selection process when firms consider launching a new product. Some opportunities with expected values below the “true” hurdle rate (i.e., the hurdle rate that would apply absent political constraints) will be implemented because these opportunities are favored by powerful managers acting in their own, narrow, self-interest, while other opportunities that exceed the “true” hurdle rate will be rejected because of their potential to undermine the
firm’s established power structure. To the extent that power accumulates within individuals or coalitions as firms age, enabling them to extract political concessions during periods of strategic change, the decisions of older firms will become more erratic than those of younger firms, in the sense that they will be less sensitive to expected performance.

To be precise, assume both old and young firms draw opportunities from the same distribution of expected values, as before. Unless noted, we use identical notation as above, i.e. organizations are denoted \( i \) and the expected value of an opportunity is denoted \( x_i \). To capture the idea that young firms are less constrained by internal politics, we assume that the young firm implements all opportunities whose expected returns exceed the hurdle rate, i.e., a new offering is launched when \( x_y > h^x_y \), where the superscript \( x \) denotes the hurdle is on the random variable \( x \) or, equivalently, the expected \textit{ex post} distribution of performance. Due to internal politics, older firms “sample” from a broader set of opportunities. Therefore, firms will launch a new product with probability \( p < 1 \) if the opportunity’s expected value exceeds a hurdle rate \( h^x_o < h^x_y \). Notably, this implies that older firms do not launch some new products which would have met the stricter standard, and launches some products which do not.

Using this framework, we can analyze the effect that political activity within firms has on the observed \textit{ex post} performance of diversifying firms. The expected value of the \textit{ex post} performance of young diversifiers is given by:

\[
E(x_y \mid d = 1) = \int_{h^x_y}^{\infty} x_y g(x_y)dx_y. \tag{3}
\]

For the older diversifiers, the expected value of ex post performance is given by:

\[
E(x_o \mid d = 1) = \frac{1}{p} \int_{h^x_o}^{\infty} px_o g(x_o)dx_o. \tag{4}
\]

Given that \( p \) is constant conditional on \( x_o > h^x_o \), this implies:

\[
E(x_o \mid d = 1) = \int_{h^x_o}^{\infty} x_o g(x_o)dx_o. \tag{5}
\]

Finally, given that, \( h^x_y > h^x_o \), comparing (3) and (5) yields the result:
\[ E_o(x_o | d = 1) < E_y(x_y | d = 1). \] (6)

In other words, due to political compromise, the ex post performance of older diversifiers is lower than the ex post performance of younger diversifiers. As shown in Figure 3, older firms sample from a broader range of change opportunities (in terms of expected returns) because internal politics distorts the change opportunity selection process. This noisy filter on opportunity selection essentially reduces the frequency of any given opportunity above the “true” hurdle rate being implemented and increases the probability of a “bad” project being implemented (as represented by the heavy dashed line in Figure 3). Even without any degradation in a firm’s ability to implement change over time, older firms, therefore, will impose a lower average hurdle rate on diversification choices compared to younger ones. Consequently, ceteris paribus, the expected performance of younger diversifying firms will exceed that of older diversifying firms.\(^7\) These arguments motivate our third hypothesis:

\[ \text{Hypothesis 3: If rigidity is primarily attributable to political constraints, then the ex post performance of older firms that diversify will be lower than the ex post performance of younger firms that diversify.} \]

2.2.3 Operational constraints and ex post performance

Political constraints motivate one internal prediction regarding the relationship between age and performance after diversification; operational constraints motivate a counter-prediction. Political constraints are rooted in a firm’s decision-making capabilities; operational constraints are rooted in the erosion of a firm’s capabilities to successfully implement agreed-upon changes. As firms age, their ability to adapt to change may decline because older firms tend to rely more extensively on routines and

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\(^7\) The political constraints mechanism implies that while the “effective” hurdle rate is lower for older organizations, older organizations only diversify in a subset of the cases above the hurdle. Thus, \( p \) must be sufficiently low for the joint test of Hypothesis 1 and Hypothesis 3 to hold. In other words, empirically, the political filter must be “strong” (or, alternatively, selective) for the joint hypothesis test that aging induces rigidity due to political constraints to be supported.
tacit knowledge built over years of trial and error. Thus, with operational constraints the expected returns to implementing strategic change (e.g., diversifying) decrease with age.

To illustrate the *ex post* performance one should expect if, otherwise identical, older firms extract less value than younger firms from diversifying, we build upon the model of performance developed above. Previously we demonstrated how internal or external constituents influenced the selection of new projects through the application of hurdle rates, and with bureaucratic constraints, when hurdle rates vary with age firm performance following diversification will also differ by age.

The operational constraints mechanism, however, does not alter the hurdle rate associated with new opportunities: firms of all ages apply equivalent hurdle rates. But, because operational constraints increase with age, the net value a firm extracts from a given change opportunity is decreasing with age. Older firms simply incur greater costs of implementing change than younger firms do. We denote the cost of implementation as a fixed cost $c$ for a given change opportunity (the result is qualitatively unchanged if implementation costs are modeled as variable costs). Thus, if the expected value of a young firm implementing change is $x$, then the expected value for an old firm that makes the same change is $x-c$.

As shown in Figure 4, the effect of operational constraints on firm adaptation shifts the distribution of expected performance from diversifying generated by older firms leftward by the amount $c$, even though the hurdle rate is the same for both firms. Therefore, the expected *ex post* performance conditional on diversification for younger firms is given by:

$$E_y(x \mid x > h) = \int_h^\infty xg(x)dx,$$

and, for older firms is given by:

$$E_o(x-c \mid x-c > h) = \int_h^\infty (x-c)g(x-c)dx.$$  \hspace{1cm} (7)

Based on the properties of the normal distribution and that $h > \mu_x$, comparing (6) to (7), implies:

$$E_y(x \mid x > h) < E_o(x-c \mid x-c > h).$$  \hspace{1cm} (8)
In other words, given operational constraints on implementation, older firms select higher quality change opportunities than younger firms do, and average realized performance is higher for older firms even net of implementation costs. Visually one can see both the operational limitation effect and the fundamental rigidity effect in Figure 4. Consistent with Hypothesis 1, older firms diversify at lower rates—the area under the curves above the hurdle rate is clearly smaller for older firms—but because the change opportunities that older firms select are drawn from points deeper in the right tail of the performance distribution, average performance is higher. Operational constraints effectively force older firms to diversify more carefully and thereby to choose fewer, but better change opportunities than younger firms. Here, the importance of distinguishing between political and operational constraints becomes clear. Operational constraints impact a firm’s ability to execute instead of its propensity to select the highest return change opportunities. As a result, with age firms focus more narrowly on the change opportunities with the highest expected returns. This logic motivates our fourth hypothesis:

\[
\text{Hypothesis 4: If rigidity is primarily attributable to internal operational constraints, then the ex post performance of older firms that diversify will be higher than the ex post performance of younger firms that diversify.}
\]

2.3 Summary of Theoretical Predictions

Each of the mechanisms underlying older firms’ tendencies towards rigidity predict that older firms will diversify at a lower rate than younger firms (H1). To understand more precisely why strategic change becomes more difficult with age, we consider how the mechanisms influence performance differentially. Support for Hypothesis 1 is necessary to test the subsequent hypotheses, and acts as the primary scope condition for subsequent applications of this manuscript’s conceptual framework. Hypotheses 2, 3, and 4 then disentangle the three rigidity-inducing mechanisms described above in order
to empirically identify the dominant, (but not necessarily exclusive), cause of rigidity in a given population of firms (e.g., hedge funds).

While we focus on performance conditional on diversification in the development of our formal predictions of Hypotheses 2-4, each of these predictions is consistent with the negative correlation between age and diversification rates posited in Hypothesis 1. The ability to predict the joint hypothesis (e.g., Hypothesis 1 and Hypothesis 3) is a crucial feature of our study, and goes some distance in dealing with alternative explanations. To be a potentially valid alternative explanation, a competing theory needs to explain both lower diversification rates in older firms (Hypothesis 1, our scope condition) and the result consistent with the mechanisms test of interest. As we discuss in more detail below, most plausible alternative explanations for any particular mechanism test will fail to explain our scope condition.

3. Data and institutional context

Hedge funds are investment organizations that, like mutual funds, pool investors’ capital for the purpose of investing in financial securities and other assets. As of March 2013 the hedge fund industry managed approximately $2.4 trillion, which is remarkable considering that the industry only managed about $50 billion as of 1990 (Hedge Fund Research 2013). In the United States, the hedge fund industry is regulated by the Securities Exchange Commission (SEC), but unlike mutual funds, hedge funds are legally constructed to facilitate extensive short selling, leverage (i.e., debt financing), and non-linear performance-based compensation measures. In order to be exempt from the stricter investment and compensation restrictions that mutual funds face hedge funds can only raise assets from “qualified purchasers,” individuals whose net investable assets are greater than $5 million or institutional investors whose net investable assets are greater than $25 million.8 The number of investors in individual hedge funds is also limited by regulation; however, in practice, this limit is rarely binding as mechanisms exist that allow firms to pool individual investors into limited partnerships that count as only a single investor.

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8 Funds may submit to more significant registration and supervisory requirements. If they do so, investors must be “accredited,” which is a less stringent standard than “qualified purchaser.”
Importantly, hedge fund strategies shape investor perceptions of these organizations and also influence evaluations of fund performance (Smith, 2011).

Hedge funds are not available to the general public and are not required to publicly report their returns. But, a large number of funds voluntarily report their returns to one or more private companies that make their data available by subscription. We integrate two of the most widely used such databases from Lipper-TASS (TASS) and Hedge Fund Research (HFR). The data from the TASS and HFR data series begin in 1977, but only includes “graveyard” funds—funds that stopped reporting to the data providers for any reason, including fund failure—from 1994. We use the survivor bias free subsample of the data 1994-2005 as our main sample, though our results are robust to using the full sample as well. Taking TASS and HFR together, we have coverage on 167,559 firm-months, from 2,781 firms, representing nearly 25 percent of the firms in the industry, over the period 1994-2005.⁹

Amongst all the datasets used in the hedge fund literature, TASS and HFR are considered the most comprehensive (Li, Zhang, and Zhao 2008). We integrate these two datasets—most researchers rely on either one or the other. However, the data do have some important limitations. Firms choose whether to report their data to HFR and TASS, therefore, the data may be subject to selection bias. Based on our discussions with hedge fund managers, we believe hedge funds are more likely to self-report to TASS and HFR when they are interested in raising capital at some future date for expansion. Thus, our results may not generalize to hedge funds that do not require external capital to expand. Another potential limitation of the data is that it may be reported inaccurately. However, annual returns reported to investors are audited and can easily be compared to self-reported monthly returns, which limits the scope for misrepresentation for most firms.

The hedge fund setting is a particularly appealing laboratory for studying the drivers of organizational rigidity. Product diversification is an important growth strategy for most hedge funds, as it allows them to put capital at risk in a new fund with its own high-water mark, which increases the chances that the

⁹ Funds with exactly the same name in both datasets were dropped from one dataset. To avoid including the same fund with slightly different names listed in both the TASS and HFR datasets we had two coders hand check the data for duplicate entries. Onshore/offshore and currency “twin” funds were also eliminated.
manager will earn performance fees. And indeed, skilled hedge funds will typically launch a new fund whenever they can convince external investors to provide capital, subject to implementation cost constraints (de Figueiredo and Rawley 2011). Thus, while hedge fund managers are typically keen to diversify, investors impose meaningful constraints on hedge fund product diversification (Shahab 2013). Furthermore, the possibility that internal constraints on implementation are increasing in older hedge funds is plausible given de Figueiredo and Rawley’s (2011) finding that age is negatively correlated with performance in diversifying firms (p.1975).

3.1 Measures

Consistent with the standard definition of diversified firms as multiproduct firms (Teece 1982) and with the literature on mutual fund product diversification (Siggelkow, 2003), we consider hedge fund firms to be diversified when they operate multiple funds. With the exception of onshore/offshore and currency twin funds, which we consider a single fund in our sample, hedge funds generally launch new funds with distinct investment objectives and/or trading strategies compared to their existing funds. Thus, a new product launch constitutes diversification and is usually distinct conceptually and practically from fund expansion. We use two measures of diversification, an instantaneous measure (Diversify), a dummy variable that is equal to one in the month in which a firm launches a new fund and zero otherwise, and a categorical variable (Diversified) that is equal to one in all months subsequent to the firm’s first diversification event, and zero otherwise. There are 2,302 diversification events in our sample involving 1,424 firms—about 30 percent of firms launch more than one new fund, after their initial entry into the industry, and therefore experience multiple diversification events—and 51 percent of firm-months are contributed by diversified firms.10

Our key explanatory variable is firm age, measured as the number of years since the firm was founded or, non-parametrically, as a vector of categorical variables. Age also enters as an interaction

10 We do not observe diversification within a fund, so-called multi-strategy funds. However, for most firms launching a new fund is preferable to running a multi-strategy fund, because it increases their chances of earning performance fees. Thus, while multi-strategy funds are diversified investment vehicles, they are not meaningfully diversified in the sense in which we are interested. That is, they have not successfully launched a new product.
term with *Diversify*, as dummy variable (*age_old*) that is equal to one when a firm launches a new product and is above the median age and is zero otherwise. The sample includes 1,339 new product introductions for firms that were older than the median age at the time of diversification and 963 new product introductions for firms that were younger than the median age at the time of diversification.

Our second and third hypotheses evaluate the relationships amongst diversification, age, and performance. Because there is general agreement in the literature that investors price financial assets controlling for systematic risk exposure, we use risk-adjusted excess returns from a standard asset pricing model as our baseline measure of firm performance.

Hedge funds may also be exposed to non-systematic risks that are not priced by standard market benchmarks. If funds take on significant non-systematic risks they may appear to generate higher average excess returns that are really an artifact of model mispricing. We, therefore, account for the non-systematic riskiness of a fund’s underlying investments using an alternative performance measure: a dynamic version of the information ratio, which divides the fund’s excess return in any time period by the standard deviation of the time-series of the fund’s excess returns. We also control for biases that may arise due to self-reporting, including serial correlation in the time series of returns using an autoregressive lag one (AR1) correction and for reporting biases, particularly backfill and timing biases, by dropping the first twelve reported monthly returns and the last ten months of reported data (January-October 2006).

Our baseline performance benchmark follows the emerging standard for assessing hedge fund performance (Sadka, 2010). The performance measure is developed based on Fung and Hsieh’s (2001) 7-factor asset pricing model, which is specifically designed for pricing risk in hedge funds by controlling for exposures to linear and non-linear equity, bond, commodity and option-based risk factors. We augment Fung and Hsieh’s (2001) model by including a “traded liquidity factor” from Pastor and Stambaugh (2003), which controls for a fund’s exposure to illiquidity risk.\(^\text{11}\) Excess returns sums a time-invariant fund-specific term \(a\) and a mean zero residual \(e\) from the regression:

\[
R_{it} = a_i + R_{ft} + X_i B_i + e_{it}, \tag{9}
\]

---

\(^{11}\)These data are available at http://finance.wharton.upenn.edu/~stambaug/ liq_data_1962_2008.txt.
where $i$ and $t$ index funds and time (in months) respectively; $R_i$ is a fund’s raw return from TASS and HFR and the vector $X$ contains the seven risk factors from Hseih’s data library and the traded liquidity factor from Stambaugh’s website. The term $a_i$ is the time invariant component of a fund’s performance and $e$ is the residual. We compute $a$, the coefficients on $X$ and $e$ by running fund-level longitudinal regressions. Excess returns $Y$ for firm $i$ in any period $t$ are defined as $Y_{it}=a_i+e_{it}$, where excess return captures the combination of a fund’s skill and luck relative to a market benchmark. We call the resulting measure “8-factor excess returns.” We then compute the information ratio as excess returns ($Y_{it}$) divided by the standard deviation of excess returns. Both the information ratio and excess returns are winsorized at the 1% and 99% level to control for extreme values, though doing so has no meaningful impact on our results. We then take the equal weighted average of fund returns and the information ratio within a firm to calculate firm performance.

Hypothesis 2 predicts that, conditional on launching new product; older firms’ *ex ante* performance will exceed that of younger firms. To test this prediction we use a standard measure of average historical excess returns, average cumulative abnormal returns (CAR), as an explanatory variable in our regressions of *ex ante* performance and age on diversification. At the fund level $CAR = \Sigma Y_{it}/n$, the sum of $n$ lagged excess returns divided by the number of months the fund was in operation at time $t$, up to a maximum of twenty four months. We then take the equal weighted average of fund returns to calculate a firm-level $CAR$. Using a maximum of two-years of prior return data in our $CAR$ calculation represents an imperfect tradeoff between including more information about the fund’s historical track record by including longer performance lags and reducing the amount of stale information in the firms track record.

### 3.2 Descriptive statistics

Table 1 shows descriptive statistics for the main sample at the firm-month level. Average age is 5.6 years, the average number of funds is 2.6, average excess returns are 43 basis points per month (or 0.43%), and the average information ratio is 16 basis points per month. Table 1 also shows descriptive

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12 Hseih’s data library is available at [http://faculty.fuqua.duke.edu/~dah7/HFData.htm](http://faculty.fuqua.duke.edu/~dah7/HFData.htm)
13 CAR measures with longer time lags produce results very similar to those reported here.
statistics for the control variables including size, measured by assets under management, three variables that measure the firm’s product mix, time (year) and regional location (USA headquarters dummy). The mean of assets under management (AUM) is $3.2B, with a maximum of $63.8 billion. In our analysis we take the non-normality of AUM into account by using AUM size deciles from the overall distribution of all firms. AUM is missing for 18 percent of firm-months. We control for such omissions using a missing AUM dummy variable. To control for trading strategy composition effects we use a continuous variable \( \text{specialist} \) \([0,1]\) that captures the fraction of funds in the firm’s portfolio, by month, that are devoted to specialty trading practices. To calculate \( \text{specialist} \) we categorize funds into three sets. Fund-of-funds are products that invest in other hedge funds. Long/short funds are general purpose hedge funds that take long positions in assets, much like a mutual fund and short assets (typically equities) that fund managers believe are overvalued. All other strategies are grouped together as specialty funds, and \( \text{specialist} \) is the fraction of specialist funds within a firm in a given month. We also include a categorical variable that is equal to one if a firm’s headquarters is in the USA and zero otherwise \( \text{HQ}_{USA} \), and a categorical variable \( \text{diversifiedentrant} \), that is equal to one if a firm enters the market as a diversified (multiproduct) hedge fund.

4. Empirical design

We theorize that when adaptation is a major challenge for firms, older organizations will launch new products less frequently than younger organizations. To estimate the impact of age on an organization’s propensity to launch new products we estimate four models of age’s effect on diversification: a pooled cross-sectional linear probability model, a differences-in-differences estimator with firm fixed effects, a Cox proportional hazards model and a piecewise exponential survival-time model where age enters non-parametrically.

The two OLS models are of the form:

\[
DIVERSIFY_{it} = a + \lambda_i + T_t + \beta_1 AGE_{it} + X_c B_c + \epsilon_{it},
\]  

(10)

where \( i \) indexes firms, and \( t \) calendar time (in months), \( \lambda \) is a firm fixed effect, it is included in the differences-in-differences specification, \( T \) is a vector of year fixed effects, \( AGE \) is our key explanatory
variable, and $X_c$ is a vector of controls as described above, and $\epsilon$ is the residual. Standard errors are robust and clustered at the firm level. We include OLS specifications in addition to survival-time models for two reasons: first, the differences-in-differences specification allows us to control for unobservable firm-specific sources of heterogeneity; and second, by comparing the pooled cross-sectional coefficient on $AGE$ with the coefficient in the differences-in-differences specification we can determine the direction of the bias from omitting firm fixed effects in the survival time models.

We use survival time, or duration, models for our main test of the first hypothesis. Duration models are well suited for our analysis because they explicitly adjust the standard errors on the coefficient estimates for right censoring, a problem that could be important in the context of hedge fund diversification. Furthermore, survival time models correct the coefficient estimates in the model to account for binary dependent variables, whereas OLS can generate predicted values that are outside the feasible range (i.e., larger than 1 or less than zero). Although OLS coefficient estimates are unbiased in the absence of omitted variables, they may be inconsistent, while duration models, if properly specified, generate unbiased and consistent estimates.

Duration models estimate the relationship between covariates and the instantaneous hazard rate of diversification for firm $i$ at any point in time $t$. Our baseline estimate of the hazard rate uses the semi-parametric exponential survival-time model:

$$DIVERSIFY_{it} = h(t) \exp(X_{it} \beta),$$

(11)

where $h(t) = \lambda_0(t)$, a constant baseline hazard rate common to all firms for each calendar month $t$, $X$ includes $AGE$ and the vector of time-varying and time-invariant controls from (10) and the $\beta$s measure the impact of $X$ or changes in $X$ on changes in the hazard rate. Standard errors are robust and clustered by firm. We verify that the exponential model estimates are robust to alternative specifications of $h(t)$ using the standard parametric assumption that $h(t)$ is distributed according to a Weibull distribution, and allowing $h(t)$ to be estimated non-parametrically using a Cox proportional hazard model (Cox 1972). Finally, we also show results using a piece-wise exponential specification that allows the effect of $AGE$ to
enter $X$ flexibly. We also correct for any correlations in the error structure that may bias the standard errors on the $\beta$ estimates by allowing for shared frailty at the firm-level.

The key econometric assumption in expression (11) is that age is exogenous so that changes in age cause changes in the diversification rate. Because age is not a strategic choice variable for the firm—at least once the firm is founded—the potential for the explanatory variable to be endogenous due to managerial choices is less severe in our context. Still, unobservable firm-specific factors correlated with age and diversification could bias our coefficient estimates on $AGE$. We address this concern by comparing the pooled OLS results with the differences-in-differences estimates to sign the bias on the baseline estimates due to omitted variables.

Once we establish that firms diversify at a slower rate as they age (i.e., Hypothesis 1), we turn to our main research question—why is adaptation difficult?—by distinguishing between the drivers of organizational rigidity (Hypotheses 2, 3, and 4). To do so we first examine how ex ante performance, measured by cumulative abnormal return, $CAR$, influences the instantaneous diversification rate for young versus old firms. To allow for a flexible set of coefficient estimates on the explanatory variable and the controls given the different states the firm could be in any point in time $t$, we compare the ex ante performance of young diversifiers against old diversifiers relative to non-diversifiers using the multinomial model:

$$Pr(y=j|X_{it}) = \frac{exp(XB_{ijt})}{1 + \sum_h exp(XB_{ih})}, \quad (12)$$

where $i$ indexes firms, $t$ indexes time (years), $j=1, \ldots, J$, indexes discrete change in scope outcomes, $h$ counts from 1 to $J$; $X$ contains the same vector of controls as in (10), including the explanatory variable $CAR$; $y=0$ in firm-months where there is no diversification, and $y=J$ when firms reduce their scope. In our baseline specification $y=1$ when the firm diversifies when it is below the median age, and $y=2$ when the firm diversifies when it is above the median age. The multinomial logit model allows for a simple and direct comparison of old and young firms ex ante performance. However, one might be concerned that defining old and young with a median split is coarse and somewhat arbitrary. Therefore, we also compare firms that diversify when they are in the youngest age quartile against firms that diversify when
they are in the oldest age quartile by expanding \( j \) to include four values (one for each quartile) in addition to \( y=\theta \) and \( y=J \). Standard errors are robust and clustered by firm.

The coefficient on \( CAR \) in model (12) tells us how the firm’s track record influences its diversification decisions. If the coefficient on \( CAR \) is larger for older firms compared to younger firms it would indicate that investors punish older firms by forcing them to outperform young firms in order to earn the right to diversify. On the other hand, if the coefficient on \( CAR \) is smaller for older firms, it would suggest that investors value long track records and so will fund diversification efforts of older firms even when their most recent observable performance lags behind younger firms.

Finally, we evaluate how young and old firms perform after they diversify. In the ideal experiment we would randomly assign otherwise identical old and young firms new products and measure the difference in their subsequent performance. In practice, we do not have random assignment in the data. Firms choose whether to diversify, based on how exchange partners external to the firm perceive them and how they expect to perform \textit{ex post}. We can, however, control for selection effects that might bias naïve estimates of age’s effects on diversification and performance by matching treatment (i.e., old diversifiers) to control (i.e., young diversifiers) group observations based on observable \textit{ex ante} differences between old and young firms that subsequently diversify. In the absence of omitted variable bias from unobservable differences between firms we can interpret the matched sample correlation between age and \textit{ex post} performance as a causal relationship (Rosenbaum and Rubin 1983).

Before controlling for selection on observables we estimate the (endogenous) correlation between age and diversification with the pooled cross-sectional model:

\[
Y_{it} = a + DIVERSIFIED_{it} + \beta_1 AGE_{it} + \beta_2 (AGE_{it} \times DIVERSIFIED_{it}) + X_{it}B_c + \epsilon_{it},
\]  

(13)

where \( i \) and \( t \) index firms and years, respectively, \( Y \) is firm performance, measured as either excess returns or the information ratio, \( DIVERSIFIED \) is a categorical that turns on when the firm first becomes diversified, and \( AGE \) is years from inception, as above. The interaction term \( AGE \times DIVERSIFIED \) captures the marginal effect of age on diversification. \( X_c \) contains the same vector of control as above (including year fixed effects). Expression (13) reverses the direction of causality between performance
and age compared to expressions (10) and (11), but in expression (13) performance is measured *ex post*—following diversification (i.e., when $DIVERSIFEID = 1$), whereas in expressions (10) and (11) we focus on *ex ante* performance (as measured by CAR) as either a control variable or an explanatory variable influencing the instantaneous diversification rate (i.e., $DIVERSIFY=1$). Thus, to estimate how old diversifiers perform relative to young diversifiers we consider both the main effect of $AGE$ and the marginal effect of $AGE \times DIVERSIFIED$.

However, we know that (13) is subject to bias due to the endogeneity of the firm’s scope decisions (Campa and Kedia 2002, Villalonga 2004). Therefore, we implement a test on *ex post* performance that is free of selection bias (on all the observables in our data set) by first matching old diversifiers to young diversifiers on all their observable *ex ante* characteristics using Coarsened Exact Matching (CEM). CEM matches old and young diversifiers that have the exact same *ex ante* characteristics, as opposed to matching on the probability of selecting into the treatment (i.e., diversifying when old) as in the more familiar propensity score matching (Iacus, King and Porro 2012). 14 After matching treatment group to control group observations all the observations are conditioned on the firms being diversified, which allows us to drop $DIVERSIFIED$, and $AGE \times DIVERSIFIED$ from (13) and estimate the causal effect of age on performance in diversified firms directly by simply examining the coefficient on $AGE$.

5. Results

Table 2 displays the results for the OLS and survival-time models of $AGE$ on $DIVERSIFY$. Column 1 reveals that the new product introduction rate falls by one tenth of 1% for each additional year the firm ages in a pooled cross-sectional specification. Relative to the baseline new product introduction rate of

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14 Using CEM to generate the matched sample suits our purposes because we want to include multiple diversification events on the same firm, and doing so would be cumbersome with other matching methods like propensity score matching. CEM is also computationally efficient and creates a valid counterfactual without balancing on a covariate-by-covariate basis. We specify that the number of control group matches must be proportional to the number of treatment group observations on a strata by strata basis based on performance (CAR) quartiles, size (AUM) quartiles, a missing AUM dummy, calendar time quartiles, firm scope (number of funds in a firm) quartiles, a USA headquarters dummy, and a fund of funds dummy. The advantage of proportional matching is that we do not have to reweight our sample by the inverse probability of selection when specifying our model of *ex post* returns. The disadvantage of proportional matching is that the matched sample generated by CEM is not identical across runs, since the program randomly selects which extra control group observations to drop. We verify that our results are not sensitive to randomly dropping different control group observations from the final match.
1.4% (2,302/167,559), aging by one year reduces the baseline new product introduction rate by about 7%. The differences-in-differences estimate of the effect of AGE on DIVERSIFY reveals that omitting the firm fixed effect from the estimate of age on the propensity to introduce a new product biases the coefficient estimate on age toward zero. Column 2 shows that the differences-in-differences estimator is more than three times the size (more negative), which gives us comfort that the magnitude of our point estimates will not be overstated in the duration models, which are estimated without firm fixed effects.

The OLS results control for firm-specific heterogeneity, but not right censoring. The exponential model in column 3 controls for censoring. The interpretation of the coefficient estimate of -0.07 is that as firms age one year from the mean age (5.6 years) their propensity to diversify falls by 5% ($e^{5.6 \times -0.07} - e^{6.6 \times -0.07}$). Running the same test using a piecewise exponential model with age entering non-parametrically by deciles shows that the new product introduction rate falls almost linearly with age for firms above the first age decile. For example moving from first to the third age decile reduces the firm’s diversification rate by 23% ($1 - e^{0.25}$), while moving from the fifth age decile to the seventh age decile reduces the firm’s propensity to diversify by 22% ($e^{-0.35} - e^{-0.72}$). Differences between the point estimates are of the correct sign and consistently estimated between every pair of age dummies that are at least three deciles apart, except one (age decile 3 compared to age decile 6). The results are consistent with the first hypothesis, predicting that aging causes the firm’s rate of horizontal expansion to slow.

We also want to understand the relative magnitude of internal organizational factors compared to external effects on the decision to introduce a new fund. Table 3 Panel A shows the results of a multinomial logit of ex ante performance on the decision to diversify for firms that were older than the median age at the time of diversification compared to firms that were younger than the median age at the time of diversification, conditioning out months where firm scope was reduced due to fund closures, compared to the baseline case of no changes in firm scope. While younger firms outperform the baseline by 14 basis points a month in the twenty-four months prior to launching a new fund (column 1) older

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15 Launching a new fund probably takes 12-18 months. Excluding funds younger than 18 months from the analysis does not change the results.
diversifiers’ *ex ante* performance is indistinguishable from the baseline (column 2). In other words, capital markets reward firms with longer track records, allowing them to diversify even when their track record is worse than younger firms by a significant margin: 17 basis points per month on average (column 3). Panel B replicates Panel A, but with finer grained potential outcomes. Instead of splitting scope expansion outcomes into two at the median age, we split diversification into four groups by age quartile. The results are even larger. Diversifiers in the youngest age quartile outperform diversifiers in the oldest quartile by 40 basis points per month. The *ex ante* performance results suggest that internal factors primarily constrain horizontal expansion in aging firms.16

Taken together the evidence on performance, new product introductions, and age supports the idea that capital markets favor older firms in general. Older firms can diversify with weaker track records *ex ante*. The implication of the *ex ante* performance result is that the effect of age on the firm’s diversification rate appears to be caused by organizational politics that prevent the firm from profitably expanding horizontally with age. Because these results are most consistent with Hypothesis 3, we conclude that rigidity in aging organizations is primarily attributable to internal factors and, more specifically, organizational politics.

In Table 4 we present estimates of the effect of new product launches and age on *ex post* firm performance. The baseline (endogenous) results on the full sample show that performance declines with age, conditional on being diversified, at a rate of two basis points per month (Model 12), or one basis point per month per unit of risk for each one year increase in age (Model 13). However, age effects swamp the marginal effect of age on diversification, which suggests that conditional on age better firms tend to launch new product. The question is whether endogenous selection effects lead to a significant bias in our estimates; models 14 and 15 answer this question by showing estimates of the effect of age on *ex post* performance in diversified firms, after matching exactly on all observable firm characteristics in

16 There are multiple alternative explanations for why older firms perform worse than younger firms prior to diversifying (e.g., organizational learning, legitimacy, etc.), but crucially, subject to the basic assumptions of our theory, none of the standard alternative explanations (or non-standard explanations that we are aware of) can generate both the *ex ante* performance result and the baseline result that older firms diversify at a lower rate than younger firms. As a result, we do not discuss such alternative explanations in great detail here.
the data *ex ante*. The matched sample results are smaller in magnitude (less negative), but still precisely estimated at approximately minus one basis point per month per year of firm age before and after controlling for systematic risk.

The estimates in Table 4 are still potentially biased from the effect of omitting unobservable firm characteristics that are correlated with both age and performance. Fortunately, the most likely threat to inference should work against finding support for our hypotheses. Presumably, older firms possess certain positive qualities that are unobservable to the econometrician, but are observable to investors, which facilitate their survival. This unobservable appeal of older firms might also explain why older firms can diversify with poorer track records than younger firms (i.e., in Table 3). Thus, the most obvious bias from endogeneity should attenuate the age effects and bias our results toward zero.

6. Conclusion

This study examines impediments to organizational change. We consider how three commonly-invoked, rigidity-producing mechanisms—exchange partner obligations, political constraints, and operational constraints—generate different patterns of firm performance in the context of major strategic change. The predictions of our conceptual framework are tested by analyzing product diversification in the hedge fund industry, where we find evidence that political constraints are the dominant source of firm rigidity. The results suggest that as hedge funds age their most powerful employees increasingly demand concessions in order to support new product launches, which makes the firm more rigid and less sensitive to the expected returns to diversification.

The results of our study are consistent with the classic literature on organizational decision-making (Cyert and March 1963; Jensen and Meckling 1976), which conceptualizes the firm as a collection of interest groups with competing objectives. But, the idea that aging catalyzes bureaucratic processes, which act as a noisy filter on project evaluation, is novel, as is the emphasis on rigidity as a barrier to diversification. Interestingly, hedge funds probably present a conservative test of the influence of internal politics on firm decision-making because hedge funds are often flat organizations with limited
hierarchical differentiation of executives and employees, and strong incentive alignment between managers and investors (Shadab, 2013).

The empirical tests in this paper focus on hedge fund diversification, but the conceptual framework is particularly well-suited for distinguishing the effects of different rigidity mechanisms in a wide variety of contexts. Of course, the primary source of rigidity likely differs by industry. For example, hedge funds are inherently ambiguous organizational forms, perhaps with lesser exchange partner obligations than, say, airlines, for-hire trucking companies, or law firms—firms that prior work demonstrates to be resistant to change (e.g., Card, 1986; Nickerson and Silverman, 2003; Phillips, et al., 2013). We offer a framework that is flexible enough to accommodate such variance across settings, and can even be adapted and applied under different scope conditions (e.g., to explore why large firms are rigid). Our approach is also not limited to the evaluation of rigidity in the context of product diversification. For example the model could readily be applied to the adoption of a new technology or the acquisition of a new business unit. Indeed, subject to a meaningful scope condition (e.g., that older firms change at a slower rate than younger firms), the framework can identify the primary source of rigidity on virtually any discrete strategic change made by firms in most industries.

7. References


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