GROWING AND SHRINKING

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ABSTRACT

In this paper, we expand the research that decomposes the variance in firm outcomes into separate factors so that they can be ordered in substantive importance. The outcome we study is growth option value, which denotes the expected return from a firm's investments which can be identified but have yet to be made, in contrast to the net present value of investments that have already been made. In our framework, we separate time periods in an industry into those when revenues are rising and those when revenues are falling. We argue that the idiosyncratic firm effect on growth option value is smaller when industry revenues are rising than the effect when revenues are falling. Our theory is that rising revenues reduce the conflict between short and long term investments and falling revenues raise this conflict. Greater conflict in turn increases the influence of organizational factors on managerial decision-making which, assuming these factors are specific to each firm, amplifies the firm effect on growth option value. In addition to this hypothesis, we present a number of moderating influences that may dampen the difference in the firm effect in rising and falling markets. Finally, we suggest that our theory has important implications for research on organizational growth, dynamic capabilities and organizational hysteresis.

INTRODUCTION

Analyzing how firms differ and how much these differences affect firm performance of various kinds underlie a substantial body of strategy research. Although the bulk of these studies examines the association between the broad characteristics of a firm and its performance, an important complementary research program focuses on how much their *variation* across firms affects the *variation* in firm performance in the sector or industry. The range of characteristics studied in this research program is fairly general, including the firm's industry, time period, geographical location, type of owner, country, cohort membership, human capital resources, and the firm itself (Fitza, 2014; Kogut, Walker and Anand, 2002; McGahan and Porter, 1997, 2002; Walker, Madsen and Carini, 2002; Xia & Walker, 2015). The purpose of these studies is to estimate which factors have the biggest impact on performance, as shown by their relatively high variance component, and thereby give guidance to future research on which topics are substantively the most fruitful to study.

In this paper, we contribute to the variance decomposition literature by theorizing about an important type of firm performance, its growth option value. Although many studies have predicted a firm's growth option value, commonly following q-theory (Tobin, 1969) and often measured as Tobin's Q (Bharadwaj, Bharadwaj, and Konsynski, 1999; Villalonga, 2004; Wernerfelt and Montgomery, 1988), there has been little research on its variance components (for an exception, see Tong and Reuer, 2006). Abel, Dixit, Eberly and Pindyck (1996) show that q-theory and real options models produce identical results for managers making decisions to expand or divest resources as market opportunities change. They also extend what Dixit and Pindyck (1994, chapter 7) call the "option value multiple," like q a measure of estimated future value of the firm over current (discounted) cash flows, to situations where managers can expand

or contract the business. These real options models thus include shifts in a firm's growth option value in rising markets, when managers invest to exploit market opportunities, and falling markets, when managers postpone investment or disinvest to preserve profitability.

For example, in a commodity industry such as oil and gas exploration and production, firms experience relatively frequent shifts in energy prices that make expansion more or less attractive. When prices rise, investment in growing the firm's resources and support activities has a higher financial return. But when markets contract, not only do firms cut back on exploration, but depending on the severity and length of the downturn, can disinvest in supporting their current operations, all in the name of maintaining short term profitability. Further, investments in other types of capability, such as finding new oil and gas reserves, estimating the size of reserves and negotiating oil field acquisitions and sales may also be curtailed in a downturn. Although these reductions bear less on the future value of the firm's current in-the-ground assets, they may decrease the firm's growth option value.

Given these contrasting patterns of investment in the two market conditions, our question is: in which condition, growing or shrinking markets, do firms differ more in their pattern of investments? Our theory is that firms vary more in shrinking markets. The reason is that compared to managers in growing markets, in shrinking markets managers experience greater conflict between short and long term goals, and decisions that are more in conflict are affected more strongly by organizational factors that are idiosyncratic to the firm. These organizational idiosyncrasies in turn increase the variance among firms in their investment decisions related to their growth option value.

Why is it important for strategy research to compare rising and falling markets in this way? The most obvious reason is that the capabilities for managing growth may be more

pervasive than the capabilities for managing contraction. If this is true, then it should be important to parse the time periods examined in growth studies (Barnett, Greve and Park, 1994; Barron, West and Hannan, 1994; Madsen and Walker, 2017) into two groups based on whether the industry experienced a positive or negative shock.

The partition into growing and shrinking markets therefore has implications for studies of dynamic capabilities. Research on dynamic capabilities (Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece and Winter, 2007; Teece, Pisano and Shuen, 1997) might consider how organizations achieve superior growth even as they experience periodic downturns. To do so may require repeatedly managing two sets of managerial competences, each of which is dedicated to a different market condition. In fact, if the variance among firms when they shrink is greater than the variance when they grow, the former becomes the more important capability.

Further, examining the variation across firms across growing and shrinking markets adds to research on hysteresis in organizations (Freeman and Hannan, 1975; Barnett, 2008). Hysteresis denotes two thresholds for a change in state of an entity; for example, materials commonly liquefy (from a solid) at one temperature and solidify (from a liquid) at another. But the concept also applies to organizational change, especially when moving from one state to another entails the preservation of investment options. For example, an organization may decide to invest in a new market when expected returns exceed a threshold for entry, but if the market declines, disinvest at a lower threshold, presumably to retain intangible assets that would be valuable if the market returns to growth (Kogut and Chang, 1996). If organizations vary more in their contributions to growth option value in downturns than in upturns, then the logic of hysteresis in decision making should differentiate between these two conditions. Further, if current viability is a function of accumulated experience (Barnett, 2008; Dierickx and Cool,

1989), there may be an empirically optimal hysteresis band, in terms of the incremental value of experience, between the investment and disinvestment thresholds under these two market conditions.

The roadmap for the paper is as follows: First, in the theory section, we lay out the relevant research on organizational growth and growth option value. We then discuss the importance of distinguishing between growing and shrinking markets. We follow with a section on the effect of organizational characteristics on long and short term goal setting. Then we present our basic proposition and move to the moderators that may condition it. Last, in a discussion of our theory, we discuss the implications of our theory for future research in strategy.

THEORY

Research on Organizational Growth and Growth Option Value

Most research on organizational growth has been based on incrementalism. Both Penrose (1958) and Nelson and Winter (1984), the two dominant theories of growth, define it primarily as a process driven by managerial practices or the replication of organizational routines, including those pertaining to investments in innovation through research and development. This tradition ignores or overrides the future value from discrete additional investments in a firm's core resource and its associated capabilities. A positive estimate of future value, separate from current returns, provides a rationale for expansion that is more than inertial path dependence, and it is here that options models, developed originally in finance, apply.

Many studies in strategic management have used the real options framework to test hypotheses about managerial decisions (Bowman and Moskowitz, 2001; Folta and Miller, 2002; Kogut, 1991; Kogut and Kulitalaka, 2001; McGrath and Nerkar, 2004). Trigeorgis and Reuer (2017) review this broad literature and identify five types of decision to which the real options

approach has been applied: defer or stage entry, grow, alter scale, switch, and abandon or exit. Adner and Levinthal (2004) criticize many of these applications on the grounds that they are confounded with path dependence, lack sufficient decision-making context, or ignore the possibility of project abandonment. Our model of "growth option value" (Abel et al., 1996) in growing and shrinking markets does not possess these faults in any obvious way.

Growth option value, as used here, denotes the sum of the firm's expected future returns from investments yet to be made and from divestments or abandonments of projects in order to preserve short term profitability. It is thus a result of both the real options to expand through new investments in current and new projects and the real options to lower, postpone or abandon investment in current or planned projects. Mirroring the literature on and practice of financial options, in the real options literature the option to expand is often called a call option, and the option to reduce, postpone or abandon an investment is a put option. The value of the call (put) option is added to (subtracted from) the returns to the first stage investment to produce the total value of the firm. Framing managerial decisions over time in terms of options – real as opposed to financial – thus requires investments - or disinvestments - in two stages. The primary problem from an option perspective is whether and when to make the second investment (the call) or disinvestment (the put).

This logic underlies q-theory (Tobin, 1969) in which the growth potential of a firm is represented by the ratio of its enterprise value to the replacement value of the firm's assets (Chung and Pruitt, 1994). The higher the q ratio, the greater the marginal return of investment in the future and therefore the greater the firm's growth potential. Abel et al., (1996) show that q equals the returns from current assets plus the expected returns from exercising puts and calls in the future. When the call option is exercised, the value of the firm increases by the return from

that investment; and when the put option is exercised, the value of the firm declines from the absence of that investment. Thus, from an options perspective, the total value of a firm depends on its decisions as it both grows and shrinks.

A quick mention of the complexities in measuring q is required. Q-theory is widely used to measure growth option value, but measuring q empirically has become a problem. The theory was developed to estimate the marginal return from future investments, but typically only average q is observable. Average q is therefore used in the vast majority of empirical tests, but with the appropriate caveat regarding measurement error. Hayashi (1982) shows that when firms are price takers and have constant returns to scale, a firm's marginal and average q are equal, and in the sections that follow we will assume that these conditions are met.

Many factors may contribute to a firm's growth option value, including shifts in input or output prices, changes in technology, macroeconomic events, and general characteristics of the firm itself such as its incentive systems, human resource practices, organization design and investment policies. The variance in growth option value across firms thus can be decomposed into a range of factors to estimate their relative contribution to it. To examine the relative effects of the firm, industry and time, Tong and Reuer (2006) decompose two measures of growth option value and find that the firm component has the strongest effect for both. In fact, they show that firm effects on measures of growth option value are more than three times as large as industry effects and explain between 25 to 30 percent of growth option variation. This result is consistent with many earlier studies that decompose the variance in accounting returns and find a strong contribution by the firm component (McGahan and Porter, 1997, 2002; Rumelt, 1991; Xia and Walker, 2015).

Inter-firm heterogeneity in growth option value, independent of industry effects, implies that returns to future investment are a function not only of market shocks but also of firm-specific behavior. Therefore, to analyze the sources of firm growth option value we need to add the firm-specific component to the conventional list of industry events and temporal shocks found in economics real options models which assume that shocks to growth potential occur for all firms in an industry in about the same degree (Dixit and Pindyck, 1994). Our contribution to this literature here is to compare the strength of the firm components in growing and shrinking markets.

Growing and Shrinking Markets

In this paper, we build on Tong and Reuer (2006) and argue that the variance in growth option value due to firm characteristics depends on whether industry revenues are rising or falling. In their well-known book on real options, Dixit and Pindyck (1994, chapter 7) explore growing and shrinking markets by examining how positive and negative market shocks affect managerial decisions for an asset - in their example an oil tanker – so that investments increase and decrease over time. Their models contain two kinds of decision, one that applies to the asset itself – e.g., acquiring, operating or mothballing the tanker – and one that applies to activities that support the operation of the tanker – e.g. maintenance. Starting from the bottom of a downturn, as the economic return from operating the asset rises, investment decisions become more attractive in the order of their cost and economic return, moving from increasing maintenance to reactivating mothballed tankers to investing in new tankers. When markets begin to contract at the end of an upswing, the order of these decisions is reversed, starting with postponing new tanker investment and continuing to decreasing maintenance.

For Dixit and Pindyck (1994), this oscillating process is symmetric: the thresholds for each type of decision are the same as markets rise and fall. But this parallelism in investment behavior over the business cycle is inconsistent with the wide literature in economics on asymmetric adjustment costs in response to environmental shocks (Hamermesh and Pfann, 1996), accounting studies of "sticky costs" (Anderson, Banker and Janakiraman, 2003) and hysteresis models of real options and investment dynamics (Bowman and Hurry, 1993; Dixit, 1992). Further, Dixit and Pindyck's (1994) model assumes that firms in the industry are homogeneous in their response to exogenous shifts in asset prices (see also Abel et al., 1995), contrary to the wide literature in strategic management and economics on heterogeneity in firm asset values and capabilities, even within a commodity industry (Barney, 1989; Jovanovic, 1982; Lippman and Rumelt, 1982; Makadok and Walker, 2000).

Since a firm's growth option value is an estimate of the marginal return to future investment in a resource and the capabilities that support it, having the resource and related capabilities "in good working order" when the time is right for future investment is a necessary condition for that return to be realized. However, when revenues decline and costs must be reduced for the firm to remain financially viable, maintaining the working effectiveness of the core resource and its associated capabilities becomes threatened. For this reason, firms attempt to retain their ability to exploit future opportunities by limiting cost reductions (Rahmandad et al., 2016).

The potential return from expansion in the future thus conditions contraction choices in the present. Those assets and activities that are less important for future growth should be the first targets for disinvestment or cost reduction. In this way, the process of decreasing costs to preserve profitability starts at the periphery of the firm's set of capabilities and moves to the core

only when the viability of the firm is threatened (Balakrishnan and Gruca, 2008). In this reverse triage, the growth potential of the firm is at first relatively preserved, as disinvestments that are least valuable for long term growth and contribute most to improving current profitability are initially targeted. But if the market contraction continues, more cost cutting is required; and the firm's expected return from future investment begins to decline. If managers want to maintain the value of the option to expand, they must continue to make investments in the firm's resources and supporting capabilities. But these investments reduce short term profitability, creating an inherent conflict in decision making (Rahmandad, Henderson and Repenning, 2016).

In contrast, investments after a positive shock (assuming their discounted cash flows are positive) support both short and long term goals. The firm invests in expanding current returns, induced by its higher growth option and higher cash flows (Abel and Eberly, 2012). These investments create a virtuous cycle, given favorable market conditions, by improving both subsequent short term returns and returns from growth. Using a systems dynamics model, Rahmandad, et al., (2016) show that the tradeoff between managing short term earnings and preserving the long term returns to an organization's capability disappears as organizational performance increases (Rahmandad, 2012). Further, in a simulation model, Abel and Eberly (2012) show that both current cash flows and the marginal return on future investments positively influence investment. Thus, in growing markets an increasing growth option value and rising cash flows from existing resources both support higher levels of investment.

The basis of our argument then is that there is a qualitative difference between growing and shrinking markets in decisions that weight investments towards short and long term performance goals. In a shrinking market – a reversal of fortune – managers are forced to confront an incompatibility between achieving short and long term performance. In this case, as

revenues drop, short term goals are oriented towards preserving profitability. But keeping profits up may require reducing costs in activities and postponing planned investment in these resources to grow the firm. These reductions lower the value of the firm's option to grow in the future and therefore the firm's growth option value. In contrast, in an expanding market, investments to improve both short and long term performance should increase growth option value, assuming the short term investments are in capabilities that support the firm's core resources to which future value is attached. We now turn to a discussion of existing research on the influence of organizational characteristics on conflict over short and long term goals.

Organizational Characteristics and Short/Long Term Decision Making

Why do organizations differ more in their decision making when markets are shrinking? We argue that the greater complexity and stress associated with investment decisions in shrinking markets makes these decisions more sensitive to organization-specific characteristics, such as formal and informal relational structures and path dependence in decision making biases (Ethiraj and Levinthal, 2009). In this way, a negative shock creates a more complex and stressful decision making situation for managers than is found when the shock is positive (Whetten, 1980). Further, the presence of conflicting managerial time horizons in falling-market investment decisions increases the exposure of managers to variation within the firm regarding biases towards short or long term performance (Laverty, 1996; Marginson and McAulay, 2007; Walker, 1985).

A range of studies have shown that the perceptions of the tradeoff between long and short term goals are determined in part by organization-specific factors. Walker (1985) shows that perceptions of long and short term goals are significantly influenced by the positions of managers in formal and informal networks within an organization as well as task characteristics,

tenure in the firm and industry, and hierarchical level. His results support Adner and Levinthal's (2004) contention that the perception of real options choices occur within and are dependent on the organizational hierarchy. The distinction between short and long term goals has also been examined in terms of short term bias or "short termism" (Laverty, 1996; Rahmandad, et al.,, 2016). Marginson and McAulay (2008) find that short term bias is predicted by both individual and organizational factors, each of which depends on the distribution of task characteristics and work groups across the firm (March and Simon, 1958, chapter 6). Further, Ethiraj and Levinthal (2009) show that when managers face more than one goal, even as few as two goals, compared to a single objective, coordination challenges are increased.

Therefore, managers in shrinking markets must choose between the need to maintain short term profitability and the desire to preserve the potential for long term growth. However, in expanding markets the conflict between the short and long term is muted; managers simply decide to grow, a singular focus; so they are less susceptible to organizational influences. Since the influence of firm idiosyncrasies on decision making should be greater in shrinking markets, we propose that the firm-specific component in bad times should contribute more to growth option value than in good times.

It is noteworthy that the firm component measures unspecified, unobservable firm characteristics. However, a number of measurable attributes of the industry or firm may moderate the firm component's effect. In a separate section below we turn to these attributes, such as liquidity, governance, and the percentage of fixed assets, to discuss their potential moderating influence.

Basic Proposition

To translate our argument into the language of variance components, we adopt its standard formalism. Following Tong and Reuer (2006), we define growth option value in terms of the ratio of the total value of the firm to the replacement value of its assets and denote this ratio by GOV_{it} in equation 1) below. GOV_{it} is predicted by a constant, μ, a firm effect, α_i, a time effect, τ_t, and an error term, ε_{it}. In equation 2) the variance of GOV_{it} is σ^2_{GOV}, the variance of the firm effect, σ^2_{α}, the variance of time, σ^2_{τ}, and the variance of error, σ^2_{ε}. This specification is common to variance component studies in strategy research which include a range of factors such as firm, industry, time period, and other general factors that may influence firm outcomes, such as country (Kogut, Walker and Anand 2002), regulatory era (Walker et al., 2002), and type of firm owner (Xia and Walker, 2015). To simplify the analytical task here, we focus on only one industry, one regulatory era, one country and one type of owner but separate the firm and time effects into expanding and shrinking markets. Expansion is designated by the **exp** subscript and shrinking by the **shr** subscript.

1) $GOV_{it} = \mu + \alpha_i + \tau_t + \varepsilon_{it}$

2) $\sigma^2_{GOV} = \sigma^2_{\alpha} + \sigma^2_{\tau} + \sigma^2_{e}$

3) $\sigma^2_{GOV} = \sigma^2_{\alpha\ exp} + \sigma^2_{\alpha\ shr} + \sigma^2_{\tau\ exp} + \sigma^2_{\tau\ shr} + \sigma^2_{e}$

We measure the heterogeneity among firms in growing and shrinking markets in terms of the percentage contribution of each firm component to the variation of growth option value. To calculate the percentage contribution of each component we simply divide it by the sum of the variances of all components. The firm effect measured in this way is independent of industry effects that capture expectations of investment decisions that are common across all firms, which are sometimes called "shared options" (Miller and Folta, 2002; Tong and Reuer, 2006). Higher

heterogeneity is observed when the percentage contribution of the firm component is stronger relative to the other factors. For example, a 25% firm-level contribution to growth option value indicates a higher degree of variability among firms than a 24% contribution. Since we argue that the variance of growth option value across firms in shrinking markets is higher than the growth option value in expanding markets, we propose the following:

Basic Proposition: The percentage of variance in GOV$_{it}$ explained by $\sigma^2_{\alpha\ shr}$ is greater than the percentage explained by $\sigma^2_{\alpha\ exp}$.

Moderating Influences

Shock duration. An important assumption behind our basic proposition is that firms in a downturn can see some daylight ahead and so face the twin tasks of preserving their growth options and remaining profitable. But what if the light of a return to a growing market becomes increasingly dim? Experience may tell managers that prices will rise at some point; but if that point is not in the near or medium term, the goal of maintaining current profitability through cost reduction may become much more salient. Thus, Banker, Byzalov, Ciftci, and Mashruwala (2014) show that cost stickiness declines the longer the duration of the downturn.

One effect of an extended market decline is likely to be a decrease in managerial conflict regarding the tradeoff between meeting short and long term goals. There are three reasons. First, the number of investors betting on a near term turnaround in the market will decline putting pressure on managers to favor improving short term profitability. Second, in the same way, arguments within the firm to maintain a long term focus are vitiated by the continuation of dropping revenues. Third, disinvestment in the long term is observable among competitors, increasing the pressure on the laggards to conform to achieving short term goals. All of these factors reduce the variation among firms in the industry regarding their growth option value. In

this way, the positive difference in the firm effect on the firm's growth option value between falling and rising markets will be lower the longer the market declines.

Fixed Asset Intensity. Capital adjustment patterns have been found to vary according to the "lumpiness" of operations. Subramaniam and Watson (2016) showed that industries with a higher percentage of fixed assets had stickier costs. They compared manufacturing, financial services, service and merchandising industries – which can be ordered by fixed asset intensity (high to low) - and found that in a downturn costs declined least in manufacturing and most in merchandising. The higher resistance to reducing costs of and around a fixed asset presumably arises from considering the future costs of reinvestment. As Dixit and Pindyck (1994) say:

> By keeping the project alive, [the firm] avoids having to incur the investment cost once again should the price process turn sufficiently favorable in the future. Therefore, the larger is the investment cost, the larger is this option value and the greater is the reluctance to abandon. (p. 222)

Since investments in fixed assets are typically seen as a basis of growth option value, high fixed asset intensity should increase the conflict regarding short and long term goals in a downturn, especially around thresholds for investment and disinvestment (Doms and Dunne, 1998). Higher conflict should open decision making to organizational influences, leading to greater variation across firms in shrinking compared to growing markets.

Financial Constraints. The literature on the relationship between capital structure (high/low financial constraint) and investment has focused primarily on the monotonicity of this relationship (Hubbard, 1998; Kaplan and Zingales, 1997, 2000). However, as Kaplan and Zingales (1997) state, it is trivial to assume that there is a positive relationship between financial constraints and the sensitivity of investment to cash flows. We argue here that this sensitivity is greater when revenues are falling in an industry than when they are rising. The reason is that as revenues decline due to a negative shock to the industry, firms that are more financially

constrained due to higher debt levels are likely to have a larger portfolio of bank covenants that may be breached, leading to partial loss of control over investment decisions (Chava and Roberts, 2008). The threat of breaching covenants increases the salience of short term goals. In rising markets in contrast, when increasing profitability inures a firm from covenant breach, high debt levels are less of a concern. The conflict between short and long term goals should therefore be higher in a downturn for firms with high debt levels, increasing the importance of firm-specific factors and therefore the variance in the growth option value across firms.

Empire Building, Overconfidence and Firm Governance. One source of inter firm variance in growth option value is management empire building (Chen, Lu, and Sougiannis, 2012) or, in a similar vein, overconfidence (Chen, Gores and Nasev, 2013). Empire builders desire to keep investing in long term projects at the expense of short term profitability. In turn, overconfident managers resist cutting costs after a negative shock to revenues because they believe the market will return to growth in the near term. Firms with either type of manager will demonstrate higher cost stickiness. These kinds of managerial bias are mitigated in firms with strong governance practices defined by board openness to varieties of shareholder action (Chen, Lu, and Sougiannis, 2012). Board intervention is clearly more likely when markets are shrinking and the contrast between short and long term goals is more salient. In this context, the variance among firms in their growth option value should be lower in a contracting market, the stronger the firm's governance practices.

Institutional ownership. Large institutional investors have been extensively studied for their influence on the investment decisions of the firms whose equity they own. An important focus of this research is the effect of institutional ownership on innovation. Bushbee (1998, 2001) shows that long term institutional owners favor continued investments in R & D during an

earnings decline, whereas transient institutional owners tend to be oriented towards short term profits. Ownership structure during a downturn should therefore be an important factor in predicting the variation in growth option value of firms in an industry. The percentages of long and short term institutional owners may therefore skew investment decisions towards or away from preserving long term value, decreasing the effects of idiosyncratic firm characteristics in both rising and shrinking markets.

DISCUSSION

Recap

Our basic proposition has been that when the variance in firm growth option value in an industry is decomposed, the contribution of firms to this variance when revenues are shrinking is greater than the contribution of firms when revenues are growing. If this is true, then behavior in contracting markets explains more of the variance in firm growth potential than behavior in expanding markets. Our argument for this difference is that declining revenues, because of a negative shock to either prices or demand, increase the tension between short and long term goals, since there is a conflict between meeting short term profitability targets and preserving long term growth potential. How this tension is resolved in each firm depends upon a range of organization-specific characteristics - such its incentive systems, formal and informal structures of authority and decision rights, and employee demographics and experience. These factors are less important in resolving conflicts around short and long term goals when revenues are growing, since investments to produce near term returns are likely to support far term returns as well. In expanding markets, there is simply less conflict between investments for the present and those for the future.

We then lay out a set of moderating influences. These moderators are drawn from studies on short and long term decision-making bias, none of which directly addresses whether growing and shrinking markets might differ in the effect these variables have on investment decisions. Our goal in exploring these moderators is solely to elaborate how they might reduce inter-firm differences in shrinking markets, without speculating in addition how they might affect differences in markets that expanding. Needless to say, tests of these effects would contribute substantially to the literature on short and long term bias.

To simplify the kind of firm our basic proposition might apply to, we have chosen to discuss briefly a well-known industry in research on real options models: firms exploring for and producing oil and gas in the United States. This industry experiences frequent positive and negative shocks due to price and demand shifts that raise and lower the revenues of all firms. The firms in this sample industry are all price-takers, roughly homogeneous in their inputs and outputs, and in the regulations they follow. However, they may vary somewhat in the quality and size of their reserves, existing and potential, and in the technologies they use to drill and pump oil and gas. Further, they differ in management preferences and practices, especially regarding risk tolerance, which create variation in short and long term orientation. They also vary in the characteristics that might moderate investing in growth option value.

How would our argument apply to other industries? For example, would our theory apply in industries where firms occupy different product market positions and set their own prices, where markets were segmented by customer preference, where the frequency of positive and negative shocks was low, where shocks occurred to input as opposed to output prices? There are a number of possibilities.

Market Segmentation

First, we can imagine industries like consumer packaged goods where firms are positioned differently in the product market and customer segments abound. In this case, the strength of positive and negative shocks would vary across segments and the positions of firms within them. It is accepted, for example, that well positioned low end mass retailers suffer less in their short term profits from recessions than mid-market retailers like department stores, whereas high end retailers vary in their sensitivity to negative demand shocks depending on the strength of their brands and product assortments. Increasing market and operational complexity, therefore, makes identifying the difference between growing and shrinking markets much more difficult. It is also much more difficult to measure growth option value.

Variation in Type of Shock

Another complication in comparing expanding and contracting markets is the kind of shocks that firms experience. Technological substitution has been frequently studied in strategy research and is commonly viewed as a type of market shift that opens or closes growth options for firms (Folta and Miller, 2002 McGrath, 1997). Yet major change in technology platforms is not frequent enough to use as a repeated negative shock for firms in an industry and would require a significant control for selection over the waves of innovation. In turn, incremental technological change is not strong enough to create a break in industry fortunes sufficient to separate expanding from contracting markets.

Another type of discontinuity that, like technological innovation, is either too infrequent and strong or too frequent and weak is regulatory change. In this case, the shift from one market state to another (e.g., regulated to deregulated) most often favors incumbents as they build new businesses around their legacy assets (Madsen and Walker, 2017). Since in any era there is typically one major regulatory change (e.g., the wave of industry deregulation in the late 1970s

and 1980s in the United States), there are not enough ups and downs in regulation to examine how firms "manage" their growth option value in cycles of expanding and contracting opportunity. Further, when industries experience small shifts in regulation, for example in safety, labor or environmental rules, firms may not feel strong enough pressure on short term profits to create significant tradeoffs between short and long term investments.

Further, some sectors, like transportation (airlines, trucking), experience repeated shocks in input prices (jet fuel, gasoline), and these shocks can be sufficient to force short/long term investment tradeoffs. However, firms in these industries are not price-takers, complicating the measurement of growth option value. Their markets furthermore are typically segmented by price- and value-sensitivity, creating dissimilarities among firms in their responses to each rise or fall in price.

Observability of management practices

Distinguishing between expansion and contraction capabilities tells us nothing about how similar they are across firms in an industry and whether their distribution is relatively sustainable due to their inimitability. One set of arguments might go as follows: In a commodity market of rising prices, investments to expand capacity are relatively straightforward and are unspecialized for many firms. How these investments are made may also be readily observable, making it easy to copy successful growth strategies. So, these capabilities are shared by many firms and heterogeneity is low. In falling markets, however, the tasks of improving efficiency by shutting down poorly performing operations and cutting staff may not be obvious to all or simple to copy. So, the diffusion of the more effective contraction practices may be weak and heterogeneity across firms may be high.

In this way, practices oriented towards the tradeoff between short and long term returns when markets are contracting may be more specific to each firm and less observable than those related to revenue growth. Although the economic logic of asset rationalization and layoffs is conceptually straightforward, how to put this logic into practice may not be so. Further, firms that adapt to falling prices most effectively may do so in ways that are tailored to the assets involved. In a way one might say that there are idiosyncratic "shadow options" these firms discover as the shift in the market requires them to reverse course (Bowman and Hurry, 1993). Such specificity makes the diffusion of these practices difficult. In contrast, expansion-oriented practices may be more general and observable, and they may also be more easily absorbed across the industry. One could say then that when times are good, it takes only an average manager to grow a firm effectively; but when the market turns sour, it takes a superior manager to preserve the value good times create.

Multibusiness Firms

Our theory has been framed by the growing/shrinking-market investment problem in single business firms. We assumed that the managers in the single businesses relevant to our theory had control over decision making and could access to financial or other types of resource only in competitive markets. That is, they could not get any "special help" from an institution such as government or a corporate owner. We made this assumption not only for simplicity but for reasons of applicability as well. We leave aside the many issues of the government subsidization of industry and discuss here the influence of corporate (i.e., multibusiness) ownership. The corporate owner effect on firm or business unit performance was an original interest of researchers using variance component analysis (Schmalansee, 1985; Rumelt, 1991; McGahan and Porter, 1997) and was found generally to be quite small compared to the effect of

the business unit itself. However, the smallness of this effect does not mean that firms in a corporation cannot benefit from inter-unit cross subsidization. Specifically, the availability of profits from other units in a corporate portfolio may decrease the stress on a unit's management from market decline and therefore reduce the hypothesized difference in the firm effect between growing and shrinking markets.

However, the potential for the cross-subsidization of profits is more complex than it first appears, and therefore we do not include corporate ownership in our discussion of moderating influences above. There are two reasons. First, the practice of cross-subsidizing business units varies widely depending on policies of decentralizing management control over decision making. At one extreme, business unit control over decisions is localized and managers are forced to act as if they owned the business themselves and so corporate ownership has little effect; at the opposite extreme, centralized control removes managerial discretion and adds noise to the decision making process across units. Without knowing how decision making is allocated across the corporate office and local units, we cannot predict how corporate ownership affects the investments across growing and shrinking markets. Second, the portfolios of multibusiness firms vary widely in their relatedness. In corporations with low relatedness business unit market trends may be less correlated across the portfolio and the effects of a downturn in one unit may be offset by profits in other units. But in corporations with high relatedness a group of units may experience the same market forces, reducing the availability of countervailing sources of profitability to buffer the effects of a downturn. To summarize, this variability across corporations in investment policy and business mix suggests that there is no single kind of moderating corporate effect comparable to those of the moderating variables we discuss above. Yet, even given its complexity, the influence of corporate ownership on the strength of the firm

effect in growing and shrinking markets is clearly important substantively and therefore deserves significant attention in future research.

Hysteresis

This distinction harkens back to our reference to hysteresis in the performance thresholds organizations respond to when changing their investment policies. We have argued that firms will triage their investments according to their impacts on both short term profitability and long term growth. This ordering may or not be the same for growing and shrinking markets, and the timing of investment and disinvestment may differ across these two market types. Moreover, assuming that firms differ more in their contraction than growth decisions, it seems highly plausible that there will be a higher variance across firms in the hysteresis pattern when markets are shrinking. Controlling for the direction of market change therefore would be desirable for predicting when specific kinds of investments are made in models of long term firm valuation.

Conclusion

When do organizations matter independent of their assets? If all firms in an industry respond in unison to shifts in their markets, then there is little need to study them as separate institutions. Industries are all we would need to look at. But variance decomposition research shows that the industry-only approach is confounded by the evidence. When it comes to financial performance, firms differ much more than the industries they belong to. In our theory, we have argued that the differences among firms are greater in periods of market contraction than in periods of market growth. The reason, we propose, is that contracting markets force a firm to choose between short and long term goals that are in conflict when times are bad but growth markets do not produce as severe a conflict between short and long term investments. Because organizational idiosyncrasies in formal and informal structure and systematic protocols are

stronger determinants of decision-making when conflict is present, there is greater heterogeneity among firms in high stress conditions. In this way, we can say that organizations show themselves as they truly are when the chips are down.

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