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ABSTRACT

This study adopts a signaling theory perspective to test the relationship between entrepreneurial orientation (EO) and market performance, and to further test theoretically meaningful boundary conditions of that relationship. We estimate our research model using an objective measure of EO among publicly traded companies from 2001-2010. Our results suggest that EO and market performance are non-monotonically related (U-shaped), and that environmental dynamism, and environmental hostility, individually and jointly influence the EO-market performance relationship.

INTRODUCTION

The possession of an entrepreneurial orientation (EO)—defined as the decision making proclivities, managerial philosophies and strategic processes evidenced through innovative, proactive, and risk-taking strategic behaviors—resulting in improved firm performance is well established (Rauch, Wiklund, Lumpkin & Frese, 2009; Rosenbusch, Brinckmann & Baush, 2010). So prevalent is this relationship in the literature that some studies into EO’s boundary conditions, for example, are foregoing offering formal hypotheses of this main effect relationship, simply accepting the connection as given (Anderson & Eshima, 2011). What is notable, however, as the recent EO meta-analyses cited previously indicate, is that the EO-performance linkage is in actuality narrowly construed. Specifically, we largely find research on the EO-performance relationship among samples of privately held small to medium sized businesses, and with sales growth rate (or another composite measure of various growth indicators) adopted as the criterion. While these studies have served the field well, there is a legitimate concern as to the generalizability of the EO-performance relationship among moderate- to large-sized businesses and across a wider range of performance metrics.

The purpose of this study, therefore, is to investigate the EO-performance relationship in a heretofore underexplored context, larger publicly traded companies, and adopting a criterion variable particularly salient to managers in firms of this type: market performance (Hitt & Ireland, 1985). This research builds on the findings of Miller and LeBreton-Miller (2011) who, in their study on the influence of governance choices in large family firms on EO, identified a positive linear relationship between EO and market performance. As the EO-market performance hypothesis in the Miller and Le-Breton Miller (2011) study was only tangential to their core research question, there remain meaningful theoretical questions on the EO-market performance connection, and leaves open the conceptual possibility for a more complex relationship between the two constructs than may be previously understood.

To better illuminate this relationship complexity, we adopt a signaling theory perspective to suggest that the EO-market performance is non-monotonic, and specifically, that there is a
U-shaped relationship between an entrepreneurial strategic posture and how the market values the performance of the company’s managers. We further employ signaling theory to revisit a core assumption made in the EO literature: that the EO-performance relationship is stronger in environments that are more dynamic and in environments that are more hostile (Covin & Slevin, 1989; Covin and Lumpkin, 2011). Motivating revisiting these boundary conditions is the generalizability concern mentioned previously: a new study setting and a new measure of performance necessitates reconsidering previous assumptions. We sympathize with the argument of Covin and Lumpkin (2011) that research probing environmental exigencies as boundary conditions of the EO-performance relationship may not yield many new theoretical insights. However, we would argue that given the dearth of EO scholarship among large, publicly traded firms, it behooves scholars to question existing relationships that may not be generalizable to all business contexts. The overarching research question in the study is, therefore, does the market reward the pursuit of entrepreneurial strategies, and how do environmental exigencies affect the EO-market performance relationship.

**THEORETICAL DEVELOPMENT AND HYPOTHESES**

Signaling theory is generally concerned with the reduction of information asymmetry between two market actors (see Connelly, Certo, Ireland, & Reutzal [2011] for a thorough review). Briefly, information asymmetry arises because ‘different people know different things’ (Stiglitz, 2002: 469); that is, market actors inherently possess idiosyncratic stocks of information, and the differences in these stocks give rise to information asymmetry. Building from the work of Spence (2002), management scholars adopted signaling theory as an appropriate mechanism to describe how firms communicate information—including beliefs, competencies, and intentions—to other market actors.

Signaling theory posits that the signal sender (signaler) engages in purposeful behavior to communicate information that reduces information asymmetry in a positive light for the firm (Connelly et al., 2011). For example, a startup firm may add a high profile executive to their board to signal managerial competency (Certo, 2003). However, signaling theory also applies to situations in which the signaler did not intend to engage in signaling behavior, but the firm’s actions had the net effect of reducing information asymmetry in a manner that may or may not have been positive for the firm (Zhang & Wiersema, 2009). Thus, firms send both active and passive signals, and whether purposeful or not, valuable information is embedded in the strategies, tactics, and behaviors pursued by all firms. Such information is subject to interpretation and parsing by other market actors. This is particularly true in the financial markets, where investors actively seek and interpret the signals sent by publicly traded firms for information on the firm’s underlying value proposition, strategies, competitiveness, and managerial competencies, which in turn are key inputs to market valuation (Certo, Daily, & Dalton, 2001; Certo, 2003).

A critical assumption underlying signaling theory is the notion of signal quality, “which refers to the to the underlying, unobservable ability of the signaler to fulfill the needs or demands of an outsider observing the signal” (Connelly et al., 2011: 43). The key point underlying signal quality is that exogenous actors parsing the sent signal respond best to higher quality signals; higher quality signals result in behaviors on the part of the signal recipient that are most favorable to the signaling firm (Kirmani & Rao, 2001). Therefore, it is in the signaling firm’s best interest to send those signals with the highest possible quality. While there are several factors that contribute to signal quality (Connelly et al., 2011), there are three factors particularly salient to the research question at hand: signal observability, signal consistency, and the signal environment.
At its most basic level, signal observability is concerned with the ability of other market actors to receive and make sense of the signal sent (Connelly et al., 2011). The salient point for signal observability is that stronger signals, that is, those signals that are more readily detectable by the signal receiver, improves signal quality; the more discernable and clearer the signal sent, the more likely that signal is to be acted upon by the signal recipient (Gulati & Higgins, 2003). Signal consistency, as defined by Connelly et al. (2011), is the congruency in signal content across multiple signals as communicated by the same sender. The logic is that, particularly when a signaler engages in multiple signaling behaviors, the extent to which the signals sent are in congruence the better able a signal receiver is to make sense of and act upon those signals (Fischer & Reuber, 2007). The signal environment refers to the exogenous conditions influencing signal communication and reception. The key point for the signal environment is the level of distortion the environment places on the signal: the greater the ‘noise’ in the signal environment, the greater the distortion of the signal and in turn the difficulty in parsing the signal increases (Connelly et al., 2011). As will be developed, the preceding three elements of signal quality are potent explanatory mechanisms for how the market responds to firm-level entrepreneurial strategies.

The Entrepreneurial Orientation – Market Performance Relationship

The crux of our argument for a non-monotonic (U-shaped) relationship between EO and market performance is that the firm’s strategic posture represents a salient signal to current and potential investors. Firms occupying the extremes of the continuum, i.e., those firms that are either predominantly conservative in their strategic posture or those that are predominantly entrepreneurial, are sending a signal that is both consistent and easily observable. Such signal quality facilitates higher market valuations because investors are better able to judge the efficacy of managerial decision-making; that is, investors are better able to understand the strategic decisions and actions of senior managers, and investors reward firms with such strategic clarity with higher valuations. Firms occupying the middle of the continuum are neither conservative nor entrepreneurial, and therefore, send a more obscure signal; investors have a more difficult time parsing signal quality, and the resulting obfuscation leads to lower market valuations.

To briefly review, EO is the decision-making proclivities, managerial philosophies and strategic processes evidenced through innovative, proactive, and risk-taking strategic behaviors. First conceived by Miller (1983), “[a]n entrepreneurial firm is one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come-up with ‘proactive’ innovations, beating competitors to the punch. A non-entrepreneurial firm is one that innovates very little, is highly risk averse, and imitates the moves of competitors instead of leading the way,” (Miller, 1983: 771).

Covin and Slevin (1989; 1991), building from this early theorizing, suggested that all firms existed on a strategic behavior continuum, ranging from the more conservative to the more entrepreneurial. Under the Covin and Slevin (1991) conceptualization, to be entrepreneurial the firm must exhibit the three behavioral elements suggested by Miller (1983)—innovativeness, proactiveness, and risk-taking—and should do so with some regularity. Thus, in addition to the observed behaviors, the firm should exhibit some temporal consistency with those behaviors. Engaging in one-off innovations would not make the firm entrepreneurial; the sustainment of those behaviors determines whether the firm is entrepreneurial in its strategic posture.

Thus, EO under what may be construed as the Miller/Covin and Slevin conceptualization (e.g., Covin & Wales, 2011), is understood as a unidimensional strategic posture, wherein each firm may
be plotted according to the shared variance—capturing the level of concurrent exhibition—of three behaviors: innovativeness, proactiveness, and risk-taking. Firms occupying the ‘high’ end of the strategic posture continuum are those that are entrepreneurial, and tend to be most associated with the normative view of what it means to have an entrepreneurial orientation. Firms on the ‘low’ end of the strategic posture continuum are decidedly more conservative and therefore simply have a conservative posture, or equivalently, low EO.

Returning to the theoretical basis for the U-shaped relationship between EO and market performance, recall that under signaling theory two of the key elements of signal quality were signal observability and signal consistency. Signal observability is the extent to which a signal is clearly communicable and easily understood by the signal receiver (Connelly et al., 2011). Signal consistency refers to congruency between signals sent by the signaler, with the logic being the greater the congruence between signals, the easier the signal is to parse by the receiver (Connelly et al., 2011). In thinking about EO as a unidimensional strategic posture—i.e., as a continuum ranging from highly conservative behaviors to highly entrepreneurial behaviors—there are two points at the continuum where the criteria for signal observability and signal consistency are at their zenith, and that is at the respective anchor points. This is because signal observability and signal consistency increase demonstrably when firms occupy the respective anchors of the strategic posture continuum. It is easier for investors to classify and make sense of firm behaviors—and the resultant firm valuations—when those behaviors align with a clear strategic direction. For example, firms that are investing in new products and product technologies, are pursuing new markets and competing aggressively to establish market leadership positions, and are willing to commit resources to projects with uncertain outcomes are easily recognized as entrepreneurial firms (Covin & Slevin, 1991). While the behaviors are the inverse, conservative firms’ signal observability and consistency are equivalently high—we know conservative firms by their continued engagement in harvesting existing technologies and existing markets, by typically adopting a ‘wait and see’ approach to the competition, and preferring risk aversion (Miller, 2011; Miller & LeBreton-Miller, 2011). As such, we expect a curvilinear relationship between EO and market performance:

Hypothesis 1: There is a U-shaped relationship between EO and market performance.

EO, Market Performance, and Environmental Exigencies

A basis of signal theory is the contingent relationship of the signal environment between signal quality and the likelihood of a signal recipient to act on the signal sent. As Connelly et al. (2011) note, while there is a theoretical basis for the role of the signal environment—the key element being that the greater the environmental interference or noise between the signaler and recipient the lower the likelihood of recipient action—this aspect of signal theory remains underdeveloped. We suggest that in revisiting a core assumption in the EO literature—that the EO-performance relationship strengthens under conditions of environmental dynamism and of environmental hostility—through the lens of signaling theory, we may enrich both our understanding of the intricacies of the EO-performance connection and the theoretical grounding of environmental exigencies in the signaling theory literature.

EO, environmental dynamism, and market performance. We define environmental dynamism consistent with Keats and Hitt (1988) as the unpredictability of change in the firm’s task environment. As Dess and Beard (1984: 56) noted, it is important to distinguish between the rate
of change in an environment and the environment’s instability, commenting that “[d]ynamism should be restricted to change that is hard to predict and that heightens uncertainty for key organizational members.” This is because constructing and enacting strategies is more difficult, and the likelihood of achieving favorable performance outcomes from those strategies decreases, as the level of uncertainty increases (Pfeffer & Salancik, 1978). In the EO literature, Miles, Covin, and Heeley (2000) argue that the EO-performance relationship—performance measured as a subjective indicator of management satisfaction with several performance indicators—strengthens as environmental dynamism increases. The argument is that in uncertain and difficult to comprehend domains, firms gain competitive advantage by pursuing innovation, taking risks, and aggressively pursuing technological and product dominance (Miller, 1983). While we agree with the preceding perspective for certain performance measures, such as sales growth, we believe that a different dynamic exists for the EO-market performance relationship.

As conceptualized, signal transmission and signal parsing do not occur in a vacuum; the ambient noise in the environment, broadly construed as those exogenous factors that obscure the intended meaning of the signal and its likely interpretation, affects the likelihood of a signal recipient to act the signal sent. Specifically, in dynamic environments characterized by high levels of uncertainty, signal observability is likely to diminish as the level of ambient noise increases as a function of the unpredictability of change. Market actors are scrambling for new sources of revenue, technological standards are changing rapidly or simply non-existent, and market leadership positions change frequently (Bettis & Hitt, 1995), resulting in difficult to communicate signals from the signalers and difficult to observe signals by investors. Signal consistency, however, is not likely directly influenced by environmental dynamism from the perspective of the signaler, although evaluating signal consistency from the recipient’s perspective is likely more challenging. While the firm’s strategic posture may be consistent, it may appear to the market as the firm is shifting strategies aimlessly and, therefore, perceived signal consistency diminishes. Collectively, we argue that across the strategic posture continuum, signal quality diminishes under high levels of environmental dynamism, with lower signal quality thus resulting in lower market valuations, or to state differently, we believe that the entire EO-market performance curve shifts downward in environments that are more dynamic. Expressed more formally:

Hypothesis 2: Environmental dynamism moderates the U-shaped relationship between EO and market performance such that the same level of EO corresponds to a lower level of market performance when the environment is more dynamic.

EO, environmental hostility, and market performance. We define environmental hostility as the absence of surplus resources in the environment to facilitate new growth (Keats & Hitt, 1988). The relative scarcity of resources and the need to grow primarily through taking market share by competitive engagement as opposed to through market expansion creates a survivability hazard for market actors (Dess & Beard, 1984; Keats & Hitt, 1988). In such domains, the EO literature argues that the EO-performance linkage strengthens as those firms that compete aggressively, proactively seek out new markets, and take strategic risks enjoy an above industry average sales growth rate partly as a function of expanding into new domains and partly as a function of increasing market share (Covin & Slevin, 1989). In considering the proposed curvilinear relationship between EO and market performance, we expect that the EO-market performance curve will shift upward in hostile environments.
We predicate our argument on the observation that market actors understand the basis for competition better in environments that are more hostile (Dess & Beard, 1984). As such, the signal environment is clearer: investors understand how firms are likely to earn above average rents and therefore reward firms that signal clarity in their strategic posture. We see evidence of such clarity by, for example, firms entering new markets and pursuing new technologies and products (i.e., being more entrepreneurial); or conversely by focusing heavy on exploitation, avoiding risky new ventures, and seeking continual improvement in business processes (i.e., more conservative). Thus paradoxically, the more hostile the environment, the less obscure the signal quality: signals become easier to observe and to parse vis-à-vis strategic fit, consistency across signals is rewarded as firms have a limited number of exploitable options to increase market share; interpreting the signal is straightforward. Therefore, we argue that:

**Hypothesis 3:** Environmental hostility moderates the U-shaped relationship between EO and market performance such that the same level of EO corresponds to a higher level of market performance when the environment is more hostile.

The joint consideration of environmental dynamism and hostility on the EO-market performance relationship. As Miller (2011) noted, the complexities of the EO-performance relationship, clearly influenced by contingent factors, may be better understood through a configurational lens, that is, through the interaction of three focal constructs. As such, we expect the existence of a complex interaction between dynamism, hostility, and EO to predict different levels of market performance, consistent with the following observations regarding the level of signal quality found in specific configurations. Building on our previous arguments, we suggest that the U-shaped relationship between EO and market performance should exhibit the strongest shift upwards under conditions where the joint signal environment strengthens signal quality, and specifically, when the environment is more stable (less dynamic) and more hostile. This is because this condition enhances both signal observability and signal consistency: certainty improves the efficacy of signal parsing, and the basis for evaluating that efficacy is easily understood. Conversely, we expect the strongest downward shift in the EO-performance relationship where the joint signal environment obscures signal quality, that is, when the environment is both highly dynamic and munificent. In this scenario, the high ambient noise stemming from unpredictable market changes confounds observability, and signal consistency is more difficult to parse because the basis for competitive advantage is more difficult to discern. As in any configurational model, there are two additional conditions: the EO-performance relationship under high dynamism and low hostility, and under low dynamism and low hostility. Unfortunately, signaling theory is not clear as to which aspect of the signal environment is stronger when considered jointly, for example, is the signal obfuscation found in more dynamic environments stronger than the signal clarity found in more hostile environments. Absent theoretical clarity, we therefore suggest that there may be no meaningful observed difference in the EO-performance relationship under conditions of competing levels of signal quality. Thus:

**Hypothesis 4:** Environmental dynamism and environmental hostility jointly moderate the U-shaped relationship between EO and market performance such that the same level of EO corresponds to a higher level of market performance when the environment is less dynamic and more hostile; and to a lower level of market performance when the environment is more dynamic and less hostile.
Research Design

We drew the data for the study from the COMPUSTAT North American Fundamentals Annual database. We extracted the relevant financial data from all firms traded on the New York Stock Exchange, the NASDAQ Stock Market, and the American Stock Exchange from the period of 1994-2010. While the range of the study spans the ten-year period from 2001-2010, the collection of previous year data was necessary for the construction of those measures reliant on prior-year observations. Following precedent (e.g., McGahan & Victer, 2010), we eliminated those firms in the banking and financial services sectors (two-digit SIC codes 60-69), in the public services space, and those firms that are unclassifiable (two-digit SIC codes 90-99). We eliminated those firms with gross revenues or total assets below $10M to avoid those firms that may be outside of mainstream economic activity for publicly traded firms (McGahan & Victer, 2010). After eliminating those observations with data missing on the variables of interest, the final sample contained 2,793 firms spanning 18,617 firm-year observations.

Variables

**Market performance.** As previously discussed, we measured market performance as Tobin’s Q, a frequently used proxy for market performance in the literature (Li & Tallman, 2011). Tobin’s Q was operationalized consistent with Chung and Pruitt (1994) as \( Q = \frac{MVE + PS + DEBT}{TA} \), where MVE is the firm’s market value; PS is the liquidating value of its preferred stock; DEBT is the sum of its short-term liabilities and book value of long-term debt, less short-term assets; and TA is the book value of the firm’s total assets. As with all variables, we assessed for skewness and kurtosis, and winsorized to the 99th and/or 1st percentile, as appropriate (Greene, 2008).

**Entrepreneurial orientation.** Consistent with the theoretical development in the study, EO represents the shared variance between the three elements of innovativeness, proactiveness, and risk-taking (Covin & Slevin, 1991). While EO is most commonly assessed using senior executive respondents to the well-validated Covin and Slevin (1989) scale, recent research has expanded the measurement options for EO to secondary data sources and the use of various financial and market indicators (Miller & LeBreton-Miller, 2011). We opted for Miller and LeBreton-Miller’s (2011) EO measure, with certain modifications, as constructed from published financial data.

We measured the innovativeness dimension as the firm’s industry-adjusted research and development intensity (R&D expenses / total assets), which is a commonly employed metric for innovation inputs (Lee and O’Neill, 2003). We measured proactiveness as the firm’s industry-adjusted retention ratio, or the percentage of profits the firm reinvests in the company each year. Given that proactiveness refers to strategic behaviors that place the firm in new domains, highly proactive firms are generally those that seek to aggressively build their firm through reinvestment of profits rather than harvesting those businesses and to return those profits to shareholders (Miller & Le-Breton Miller, 2011). Following Wright, Kroll, Krug, and Pettus (2007), we measured risk-taking as the industry-adjusted standard deviation of the current and preceding four years return on assets (five total data points). A commonly employed variance-based measure of risk in the strategy literature, this indicator captures the variance in firm profitability over a lagged period.

Because EO under the Miller/Covin and Slevin conceptualization is the shared variance between the three dimensions (representing a unidimensional strategic posture), we constructed a composite measure of EO by extracting the first common factor (the only factor with an eigenvalue
greater than 1) from the innovativeness, proactiveness, and risk-taking indicators. This measure is thus a true reflective measure of EO, and conforms to Covin and Wales’ (2011) observation that a reflective measurement approach is most consistent with the Miller/Covin and Slevin conceptualization. As with all predictors we standardized the measure and used the standardized value to construct the curvilinear EO term and all interaction variables.

Environmental hostility. Following Keats and Hitt (1988), we measured environmental hostility as the additive inverse of the five-year average growth in net industry sales. To calculate the measure, year variables were adopted as predictors with net industry sales for each industry as the criterion in a regression analysis with the following form: \( y_t = b_0 + b_1 t + a \), where \( y \) = industry sales; \( t \) = year; and \( a \) = the residual. Consistent with Bergh and Lawless (1998), we used five years of data for each regression. The regression slope coefficient is a measure of environmental munificence (the inverse of hostility; see Covin & Slevin [1989]), representing the average growth rate over the period, with higher values representing environments that are more munificent. We then multiplied the measure by -1 to better align with our theoretical arguments (i.e., higher values corresponding to greater environmental hostility).

Environmental dynamism. The standard error of the regression equation used to construct the environmental hostility measured environmental dynamism (Keats & Hitt, 1998; Bergh & Lawless, 1998). The standard error represents the level of discontinuity, or unpredictability, within the industry’s growth, with higher values indicating higher levels of dynamism.

Control variables. We employed six control variables in our model, including industry adjusted sales growth rate, industry adjusted return on sales, gross revenue, total employees, industry adjusted available slack, and the debt to equity ratio.

Model Estimator

We opted for a 2SLS estimator to account for the endogenous relationship between EO and market performance. Following Greene (2008), we first regressed one-year lagged values of Tobin’s Q, sales growth rate, ROS, gross revenue, debt/equity ratio, and total employees on EO in a fixed effects model controlling for unobserved heterogeneity at the firm level, and including year dummies to control for contemporaneous correlation (Certo & Semadeni, 2006). The predicted values from the first state regression were included in a second stage test of the research model with appropriate control variables, again including firm level fixed effects and year dummies, and correcting for bias in the standard errors (Greene, 2008).

Results

Table 1 presents the model results. Please note that the use of firm-level dummy variables to account for fixed effects in the estimator results in a heavy upward skew of the \( R^2 \) statistic (e.g., \( R^2 > .7 \)). As such, we also report the Deviance statistic (-2 * log likelihood) as an additional measure of model fit, which shows a steady improvement in fit across the estimated models. As a point of comparison, estimating the models using a time-series cross-sectional fixed effects estimator, although not accounting for endogeneity, produced overall \( R^2 \) statistics ranging from .03-.04, and were significant at the p < .001 level. Also, please note that as Model 1 includes just the control variables, we used a fixed effect estimator and not a 2SLS estimator.
Model 2 in Table 1 contains the results of the test of Hypothesis 1, which predicted a non-monotonic (U-shaped) relationship between EO and market performance. We found support for Hypothesis 1 in Model 2 ($\beta_{EO} = .003, p > .1$; $\beta_{EO}^{Squared} = .023, p < .001$). While the strength of the coefficients suggests the U-shape (the stronger and positive curvilinear term relative to the smaller, insignificant linear term), a plot of the coefficient estimates confirmed that higher levels of Tobin’s Q are observed at low and high levels of EO, whilst lower levels of market performance occur at moderate levels of EO.

Model 3 in Table 1 contains the results of testing Hypotheses 2 and 3, which predicted that environmental dynamism and environmental hostility, respectively, would moderate the U-shaped relationship between EO and market performance. Our results support Hypothesis 2 but not Hypothesis 3. The coefficient for the curvilinear EO and linear dynamism term is significant ($\beta = .012, p < .01$) and, when considered in conjunction with the lower-order interaction terms, suggests that while holding the level of EO constant, higher levels of Tobin’s Q occur in more certain environments than in those more dynamic. Following Cohen et al. (2003), we plotted the interaction in Figure 1. Hypothesis 3 received no support. However, the lower-order linear interaction between EO and environmental hostility was significant ($\beta_{EO} = .017, p < .05$), and further robustness checks suggested the presence of monotonic moderation. Plotting the linear interaction in Figure 2 following Cohen et al. (2003) thus suggests the EO-market performance relationship is stronger in more hostile environments than in those more munificent.

Hypothesis 4 predicted a joint interaction of environmental dynamism and environmental hostility on the EO-market performance relationship. The results in Model 4 in Table 1 indicate support for the configurational model ($\beta = .009, p < .05$), however, given the complexities inherent to three-way interactions, we plotted the results in Figure 3. The plot suggests a more complicated series of results than hypothesized. While we will explore these results in detail in the Discussion section, we may broadly state support for Hypothesis 4 in that the EO-market performance relationship shifts upward under conditions of low dynamism and higher hostility, and shifts downward under high dynamism and low hostility.

**Discussion and Implications**

Consistent with our theorizing, EO exhibits a U-shaped relationship with market performance. This finding is a departure from EO studies that identify a positive linear relationship between EO and various manifestations of firm performance (Rauch et al., 2009; Rosenbusch et al., 2010), and with Miller and Le-Breton Miller (2011) who found a positive linear relationship between EO and Tobin’s Q. We would like to note that during robustness checks, we also identified a positive linear trend between the two constructs, however, signaling theory suggested that a curvilinear relationship may be most likely, and this was indeed the case. This finding is significant for two reasons. The first reason is that investors seem to prefer—in the form of higher valuations—firms that signal clarity in their strategic posture, that is, occupy space at the anchor points of the posture continuum. As discussed, the anchor points provide maximum signal observability and signal consistency, thereby increasing signal quality, and resulting in higher market valuations (Connelly et al., 2011). The second reason this finding is important is that there is growing evidence for non-monotonic EO-performance relationships (e.g., Tang et al., 2008), and EO scholars may wish to consider a non-monotonic likelihood in future EO studies.
Consistent with signaling theory, we observe an upward shift in the EO-market performance curve in less dynamic (i.e., more stable) environments. This supports our argument that high levels of dynamism obscure signal quality; signals are more difficult to observe and their consistency more difficult to ascertain as environmental noise caused by unpredictable market changes increases. This relationship is contrary to the EO literature that argues for a strengthening of the EO-performance relationship in more dynamic environments (Miles et al., 2000). We would like to note that our study does not suggest that the contingency relationship between EO and dynamism on, for example, sales growth rate is incorrect. Rather, we argue that for market-based measures of performance, and consistent with signaling theory, investors are likely to respond to firms operating in more unpredictable environments with lower market valuations when considered jointly with the firm’s strategic posture.

Marginally consistent with our theoretical approach was the EO-environmental hostility interaction. As our primary model and robustness checks indicated, there is a monotonic contingency effect of hostility on the EO-market performance relationship such that firms with an entrepreneurial strategic posture achieve higher valuations when operating in environments that are more hostile. Furthermore, we observe a negative performance implication from adopting an entrepreneurial posture under more munificent conditions, that is, investors punish entrepreneurial firms with lower valuations in munificent environments. One explanation for these findings may be that, while signal quality improves under hostile conditions, investors react to those signals in the form of higher valuations only when such signals indicate a growth orientation through pursuing entrepreneurial strategies. Because the basis for competition in hostile environments is well understood (Dess & Beard, 1984), investors reward only those firms that signal competitive aggressiveness, a focus on product and process innovation, and a willingness to pursue untested projects. Conversely in more munificent environments, while generally supportive of new growth initiatives across market actors (Keats & Hitt, 1988), it is less clear to investors whether the firm’s specific entrepreneurial behaviors are leading to above average performance or if such performance is simply a function of a favorable task environment. As such, investors appear less willing to reward behaviors perceived as highly risky, preferring instead to favor those firms signaling a more conservative, harvest-based strategic posture when resources are abundant.

We further observed support for our configurational model that the joint influence of environmental dynamism and environmental hostility, in conjunction with the firm’s strategic posture, would predict differing levels of market performance. We observed the highest valuation among firms with an entrepreneurial posture operating in less dynamic but more hostile environments. This is consistent with our hypothesis that the signal environment under this condition most favors improved signal quality; signal observability and consistency increase, resulting in improved sensemaking on the part of the signal recipient, who in turn rewards those firms with higher valuations for more entrepreneurial firms. However, consistent with our finding in Hypothesis 3, this trend is generally monotonic, that is, the same signal quality from adopting a conservative posture under this configuration resulted in lower valuations.

Also partially consistent with our hypothesis, we observed lower levels of the EO-performance relationship under dynamic and munificent environments. While the EO-performance curve did shift downward, we also observed a noticeable modification in the rate of change of the EO-performance relationship, and specifically, rather than maintaining the U-shaped relationship the curve shifts to one that appears to decrease at a decreasing rate, resulting in a steady decline...
(although slowing) in performance as the level of EO increases. One explanation for this finding may be, as we posited in our discussion of Hypothesis 3, that environments that are more munificent obscure evaluating the efficacy of the strategic posture signal vis-à-vis the basis for competition in the environment. As such, despite signaling consistency in its strategic posture, the nature of the signal environment so obscures the evaluation of the fit between entrepreneurial behaviors and the market that valuations drop precipitously.

We would like to further highlight the findings of our configurational model. As discussed in Hypothesis 4, signaling theory was unclear as to differential predictions of the signal environments when considered jointly. Specifically, we are referring to conditions where the joint signal environment results in conflicting interpretations of signal quality. For example, when the environment is both more stable and more munificent, signal quality improves through lower dynamism, yet diminishes through higher munificence. Furthermore, when the environment is both more dynamic and more hostile, signal quality diminishes with dynamism yet improves with hostility. Our results indicate the presence of differential EO-market performance relationships under each condition, with the EO-performance curve shifted upward under the low dynamism, low hostility condition. One explanation for this finding may be that, as we found for Hypothesis 3, investors parsing strategic posture signals in more munificent environments experience difficulties evaluating the efficacy of entrepreneurial strategic behaviors relative to the basis (which is obscured) of competition in the industry. However, the signal quality clarity provided under more dynamic environments may be such that these signal parsing challenges are overcome, and therefore investors are more willing to reward entrepreneurial firms with higher valuations. Conversely, the signal quality diminishment found in highly dynamic environments may be such as to overwhelm the signal quality improvement found in more hostile environments, and holding the level of EO constant, results in a lower valuation. The preceding results suggest, although warrants further research, that environmental dynamism may be a more salient signaling environment in terms of influencing signal quality and resultant behaviors by signal recipients than environmental hostility (Connelly et al., 2011; Gulati & Higgins, 2003).

An implication from our study is that the performance-related benefits of adopting an entrepreneurial strategic posture manifest differently depending on the type of performance metric employed. While this may seem somewhat intuitive, the normative view in the EO literature is that adopting an entrepreneurial strategic posture results in a universally positive linear improvement in performance as broadly construed (Anderson & Eshima, 2011). Positing that EO results in different performance outcomes, although admittedly likely as a function of the differences between publicly traded and privately held firms and in the performance metrics salient to managers in those respective firms, represents a departure from previous EO studies.

A further implication of our study is that there is not a universal impact of environmental exigencies on the EO-performance relationship, and that a configurational model incorporating the joint consideration of environmental dynamism and hostility paints a finer-grained picture of the impact of the firm’s task environment on entrepreneurial firms. This is perhaps most salient when considering the influence of environmental dynamism, which had previously been argued to strengthen the EO-performance relationship (Miles et al., 2000). Signaling theory and our empirical results suggest that, in so far as market performance is concerned, firms operating in less dynamic environments and that signal clarity in their strategic posture (either highly entrepreneurial or highly conservative) reap higher valuations than their peers in more dynamic environments.
environments. Furthermore, we also found in our configurational model a stronger influence of
dynamism versus hostility, which is a heretofore-unacknowledged possibility in the EO literature
and warrants additional study (Covin & Lumpkin, 2011).

Our research question in this study was to examine whether the market rewarded the adoption
of an entrepreneurial strategic posture, and how do environmental exigencies change the nature
of the EO-market performance relationship. Adopting a signaling theory perspective, we found
a U-shaped relationship between EO and Tobin’s Q, suggesting that investors reward those firms
that signal clarity in their strategic posture, that is, are easily identified as either entrepreneurial or
conservative firms. We also identified a pattern of relationships at odds with the normative view
in the EO literature, for example, while holding the level of EO constant, we observed higher levels
of market performance under more stable (less dynamic) environments. Collectively, we believe
that our study represents a meaningful extension of the EO literature.

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FIGURE 1
EO, Environmental Dynamism, and Market Performance

FIGURE 2
EO, Environmental Hostility, and Market Performance

FIGURE 3
EO, Dynamism, Hostility, and Market Performance
<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
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<tr>
<td><strong>Sales Growth Rate</strong></td>
<td>.071***</td>
<td>.015</td>
<td>.013</td>
<td>.013</td>
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<tr>
<td></td>
<td>(.005)</td>
<td>(.008)</td>
<td>(.008)</td>
<td>(.008)</td>
</tr>
<tr>
<td><strong>Return on Sales</strong></td>
<td>.058***</td>
<td>.042***</td>
<td>.041***</td>
<td>.041***</td>
</tr>
<tr>
<td></td>
<td>(.005)</td>
<td>(.008)</td>
<td>(.008)</td>
<td>(.008)</td>
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<tr>
<td><strong>Gross Revenue</strong></td>
<td>.464***</td>
<td>.804***</td>
<td>.789***</td>
<td>.796***</td>
</tr>
<tr>
<td></td>
<td>(.039)</td>
<td>(.061)</td>
<td>(.061)</td>
<td>(.061)</td>
</tr>
<tr>
<td><strong>Slack Resources</strong></td>
<td>-.089***</td>
<td>-.060***</td>
<td>-.063***</td>
<td>-.064***</td>
</tr>
<tr>
<td></td>
<td>(.009)</td>
<td>(.014)</td>
<td>(.014)</td>
<td>(.014)</td>
</tr>
<tr>
<td><strong>Debt/Equity Ratio</strong></td>
<td>.002</td>
<td>-.001</td>
<td>-.001</td>
<td>-.001</td>
</tr>
<tr>
<td></td>
<td>(.005)</td>
<td>(.008)</td>
<td>(.008)</td>
<td>(.008)</td>
</tr>
<tr>
<td><strong>Employees</strong></td>
<td>-.503***</td>
<td>-.340***</td>
<td>-.335***</td>
<td>-.341***</td>
</tr>
<tr>
<td></td>
<td>(.036)</td>
<td>(.054)</td>
<td>(.054)</td>
<td>(.054)</td>
</tr>
<tr>
<td><strong>EO</strong></td>
<td>.003</td>
<td>.003</td>
<td>.002</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.014)</td>
<td>(.014)</td>
<td>(.014)</td>
</tr>
<tr>
<td><strong>EO2</strong></td>
<td>.023***</td>
<td>.021***</td>
<td>.019**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.006)</td>
<td>(.006)</td>
<td>(.006)</td>
<td></td>
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<tr>
<td><strong>Dynamism</strong></td>
<td>-0.04**</td>
<td>-0.03**</td>
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<tr>
<td></td>
<td>(.010)</td>
<td>(.010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hostility</strong></td>
<td>-.014</td>
<td>-.002</td>
<td>-.015</td>
<td>-.015</td>
</tr>
<tr>
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<td>(.010)</td>
<td>(.012)</td>
<td>(.009)</td>
<td>(.009)</td>
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<tr>
<td><strong>EO * Dynamism</strong></td>
<td>-.011</td>
<td>-.015</td>
<td>-.009</td>
<td>-.009</td>
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<tr>
<td></td>
<td>(.011)</td>
<td>(.015)</td>
<td>(.009)</td>
<td>(.109)</td>
</tr>
<tr>
<td><strong>EO * Hostility</strong></td>
<td>.017*</td>
<td>.019*</td>
<td>(.008)</td>
<td>(.008)</td>
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<td></td>
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<td>(.008)</td>
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<td>(.008)</td>
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<tr>
<td><strong>EO2 * Dynamism</strong></td>
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<td>.010*</td>
<td>(.004)</td>
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<td>(.004)</td>
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<td>(.004)</td>
<td>(.004)</td>
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<td>-.001</td>
<td>(.004)</td>
<td>(.004)</td>
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<tr>
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<td>(.004)</td>
<td>(.004)</td>
<td>(.004)</td>
<td>(.004)</td>
</tr>
<tr>
<td><strong>Dynamism * Hostility</strong></td>
<td>-.014*</td>
<td></td>
<td>(.006)</td>
<td>(.006)</td>
</tr>
<tr>
<td></td>
<td>(.006)</td>
<td>(.006)</td>
<td>(.006)</td>
<td>(.006)</td>
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<tr>
<td><strong>EO * Dynamism * Hostility</strong></td>
<td></td>
<td>(.005)</td>
<td>(.008)</td>
<td>(.008)</td>
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<td></td>
<td>(.005)</td>
<td>(.008)</td>
<td>(.008)</td>
<td>(.008)</td>
</tr>
<tr>
<td><strong>EO2 * Dynamism * Hostility</strong></td>
<td></td>
<td>(.009)</td>
<td></td>
<td>(.009)</td>
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<td></td>
<td>(.009)</td>
<td>(.009)</td>
<td>(.009)</td>
<td>(.009)</td>
</tr>
<tr>
<td>( \lambda )</td>
<td>1.155***</td>
<td>1.160***</td>
<td>1.164***</td>
<td></td>
</tr>
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<td></td>
<td>(.089)</td>
<td>(.086)</td>
<td>(.086)</td>
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</tr>
<tr>
<td><strong>Constant</strong></td>
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<td>.530*</td>
<td>.516*</td>
<td>.510*</td>
</tr>
<tr>
<td></td>
<td>(.0178)</td>
<td>(.244)</td>
<td>(.246)</td>
<td>(.245)</td>
</tr>
<tr>
<td><strong>R2</strong></td>
<td>.698</td>
<td>.733</td>
<td>.734</td>
<td>.734</td>
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<tr>
<td><strong>Deviance</strong></td>
<td>22938.44</td>
<td>28392.92</td>
<td>28338.42</td>
<td>28320.46</td>
</tr>
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</table>

* N = 18,617; number of firms = 2,793. Year and firm dummies omitted. Standard errors reported below and in parentheses. EO: Entrepreneurial Orientation. \( \lambda \): First stage estimated parameter.

* p < .05    ** p < .01    *** p < .001