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The Effects of Prior Experience on the Success of Major Strategic Reorientation

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Abstract

In this paper, we examine the extent to which various sources of firm experience, including a firm?s change experience, can be helpful to firms undergoing major strategic change or strategic reorientation. The strategic reorientations we analyze are, on average, more extensive than those typically studied, since they are situations in which firms shift the bulk of their resources (change primary industry) from one industry domain to another domain across one-digit industrial sectors. These are sector changes, such as a move from basic manufacturing to retail trade or finance. When attempting extensive changes to less familiar markets, firms are presumed to have little relevant experience on which to draw to increase post-change success. Nevertheless, we empirically test the efficacy of several possible sources of experience. Specifically, we examine the firm?s (1) direct experience with the new activity; (2) indirect experience obtained by operating in related activities; (3) imported experience obtained by acquiring a firm in a new activity; and (4) change experience acquired through past market entries. We find that the only source of experience that has a positive effect on firm performance after a strategic reorientation is change experience obtained by firms in the course of prior market entry. The results suggest that as a firm accumulates change experience, it may be able to apply that experience to improve firm performance during a major strategic reorientation.

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ABSTRACT

In this paper, we examine the extent to which various sources of firm experience, including a firm's change experience, can be helpful to firms undergoing major strategic change or strategic reorientation. The strategic reorientations we analyze are, on average, more extensive than those typically studied, since they are situations in which firms shift the bulk of their resources (change primary industry) from one industry domain to another domain across one-digit industrial sectors. These are sector changes, such as a move from basic manufacturing to retail trade or finance. When attempting extensive changes to less familiar markets, firms are presumed to have little relevant experience on which to draw to increase post-change success. Nevertheless, we empirically test the efficacy of several possible sources of experience. Specifically, we examine the firm's (1) direct experience with the new activity; (2) indirect experience obtained by operating in related activities; (3) imported experience obtained by acquiring a firm in a new activity; and (4) change experience acquired through past market entries. We find that the only source of experience that has a positive effect on firm performance after a strategic reorientation is change experience obtained by firms in the course of prior market entry. The results suggest that as a firm accumulates change experience, it may be able to apply that experience to improve firm performance during a major strategic reorientation.

Although much theory and empirical research within the field of strategic management has focused on the sources of supernormal profit returns, a surprising number of firms struggle or flounder in the storms of market dynamism. Between 1987 and 1997 over 30% of all public firms (as reported in Compustat) had negative average pre-tax profits and the rate of replacement among the Fortune 1000 firms has accelerated from 35% between 1973 and 1983 to 60% between 1993 and 2003 (Lawler and Worley, 2006). Indeed, recent research suggests that competitive advantage has become even "more fleeting and difficult to sustain" (Wiggins and Ruefli 2005). When performance persistently flags or better opportunities arise, firms face the question of whether and how to make a major strategic change.

In cases where the demands of strategic change are incremental, familiar, or recurring, a firm may be able to draw upon relevant organizational experience or processes to successfully change. For example, prior studies have examined strategic change when entering related product markets (Haveman 1992; Mitchell and Singh 1993; Klepper and Simons 2000; Kraatz and Zajac 2001), reconfiguring business units (Galunic and Eisenhardt 2001; Karim 2005), developing product innovation (Gersick 1994; Eisenhardt and Tabrizi 1995), and incrementally adjusting to technical and environmental shifts (Henderson and Cockburn 1994; Brown and Eisenhardt 1997). In these cases, firms leverage knowledge and experience acquired over time in the course of responding to familiar environmental demands (Starbuck 1965; Nelson and Winter 1982; Levitt and March 1988; Amburgey, Kelly et al. 1993; Teece, Pisano et al. 1997; Eisenhardt and Martin 2000; Winter 2003).

However, when the demands for change are more radical, unfamiliar, or infrequent, how do firms make more significant strategic reorientations? In some cases a firm may be performing so poorly in its current industrial markets that leaders feel a major change in strategy is

warranted through transformational actions. Such "discontinuous changes" represent a major shift in the resources and strategy of the firm (Romanelli and Tushman, 1994; Lant Milliken and Batra, 1992; Tushman and Rosenkopf, 1996; Gordon, Stewart, Sweo, and Luker, 2000). Tushman and Rosenkopf (1996:940) define such "strategic reorientation" as "system-wide organizational changes that involve concurrent shifts in strategy, structure, power, and control mechanisms." While the challenges and pitfalls of making major reorientations have been examined, much less attention has been paid to the conditions under which firms successfully make such major strategic reorientations. Given the fact that an increasing number of firms face the specter of major strategic reorientations, it seems important to understand what contributes to a firm being able to successfully initiate this type of major strategic change.

Most prior research has shown that when firms attempt major organizational change the result is inferior performance or firm failure (Hannan and Freeman 1989; Greve 1999). The difficulty arises because firms make accumulated investments in learning and these investments in learning have limited range or scope of application in a new setting (Winter, 2003). For example, a firm that competes as a computer manufacturer would presumably have difficulty reallocating resources to compete as an electronics retailer (as Tandy computer did when it strategically reoriented around Radio Shack).   Nonetheless, the experience of the firm does have value and this raises the question of whether firms attempting a major strategic reorientation— such as reallocating resources to pursue product markets in a different industry—have any experience in their portfolio that could help them make such changes. What types of prior experience, if any, can help a firm successfully initiate a major strategic reorientation? Such a question raises the even more important theoretical issue: what is the scope of application for experience developed in one context when it is extended to another context?

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In this paper, we explore the boundaries of experience by examining the extent to which various sources of firm experience can be helpful to firms involved in strategic reorientations. Strategic reorientations are defined as "discontinuous changes" and are typically a response to "volatile or turbulent industry environments" (Gordon, Stewart, Sweo, and Luker, 2000: 915). Moreover, they occur rather rapidly (most studies operationalize the change as occurring over 2-3 years;[1] see Romanelli and Tushman, 1994; Lant Milliken and Batra, 1992; Tushman and Rosenkopf, 1996; Gordon, Stewart, Sweo, and Luker, 2000). We operationalize strategic reorientation as the case in which the revenue share of the primary (largest) business segment in a firm rapidly changes to a business segment that differs at the one-digit SIC level. These are major changes in strategy because they involve a major shift in a firm's attention (Ocasio, 1997) and resources from the existing business to a business segment that is significantly different based upon SIC classification.[2]

Since a firm's prior operational experience would not be expected to be helpful to a firm reorienting around a very different business segment, one might logically ask what experience the firm could possess that would be helpful. One answer offered by some strategy scholars is "change experience" (or dynamic capabilities), defined as a firm's ability to modify its resource base and adapt to changes in its competitive environment (Teece et al 1997, Eisenhardt and Martin 2000; Franco, Sarkar, Agarwal, Echambadi). In other words, a firm with more experience at making minor changes in its resource base—perhaps entering numerous new

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[1] In contrast, "strategic renewal" is a term that has been used to refer to strategic changes that occur in an evolutionary way over a long period of time (for example, IBM's gradual shift in focus and resources from computer hardware to services; NEED CITES).

[2] These are industry sector-level changes, such as a move from basic manufacturing to services, or retail trade to finance. We examine one-digit strategic change because according to SIC classification such changes are presumably greater than 2-digit or 3-digit changes, thereby allowing us to push the boundaries of the application of a firm's experience from its prior majority share business segment. Studies of unrelated diversification have not tested the role of experience in successful unrelated diversification (by definition the business is "unrelated" and therefore a firm's existing experience isn't relevant) and these studies do not focus on firms that reorient around the new "unrelated" business.

product markets—would presumably have developed some change capabilities that might be useful in effecting a major change in its resource base. Thus, firms with practiced experience at modifying the resource base might well be more capable at successfully engineering a strategic reorientation of the type we study. Alternatively, we would expect that the more knowledge a firm is able to leverage or acquire about how to operate in the new business segment, the more successful the reorientation. A firm could possess greater knowledge about how to operate in the new business segment: a) the longer the new segment has been in the firm's portfolio of businesses before the firm decides to reallocate the firm's resources to it, b) the more knowledge the firm can leverage from its experience in its current majority share business segment (the more "related" the prior largest business segment is to the new segment), or c) when it imports direct operational experience in the new business segment through acquisition.

In this paper we explore the role of *change experience*, *direct experience*, *related experience*, and *acquired experience* on firm performance after a reorientation (Helfat et al; Teece et al 1997, Eisenhardt and Martin 2000; Franco, Sarkar, Agarwal, Echambadi). We examine the effects of these types of experience in both predicting the likelihood of a firm making a major strategic reorientation as well as the effect of that experience on the performance of the reorientation itself. Consistent with predictions, we find that firms attempting strategic reorientation are newer, smaller, low profit firms that compete in low profit industries but who target higher profit industries. The results also show that firms are more likely to initiate reorientations when they have prior new market entry experience, have acquisition experience, and find relatedness in the activities of their primary business segment and a business segment defined as "unrelated" based upon SIC code classification. Surprisingly, we find that, on average, firms that initiate strategic reorientations improve profitability during the subsequent

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five-year period, reversing a trend of declining profits. These results contrast to a widely held view that organizations seldom succeed in making radical changes in the face of environmental threats (Hannan and Freeman 1977; Hannan and Freeman 1989).

Finally, despite the fact that several types of firm experience increase the likelihood of a firm initiating a major strategic reorientation, once the firm makes a change, the only experience that seems to consistently increase post-change performance is a firm's past "change experience." In other words, firms with more experience at reallocating resources to modify their resource base on a small scale (in this case, more experience entering new markets) are more likely to be successful reallocating resources and modifying the resource base of the firm in a major way through a reorientation. Somewhat surprisingly, no other type of experience— direct experience with the new business segment, related experience with the new business segment, or acquired (imported) experience with the new segment—had a significant influence on post reorientation performance. The empirical results confirm that even though strategic reorientation is fraught with uncertainty and potentially hazardous outcomes, firms with change experience (or what some strategy scholars may view as emerging dynamic capabilities), can significantly improve the odds of success. This implies that firms with change experience develop change capabilities and that the range of successful application for those capabilities may extend beyond the domain in which they were originally developed. These results provide new insights into the role of experience when making strategic reorientations, an arena where theories of learning and experience are rarely studied.

THEORY AND HYPOTHESES

Experience with Change and Strategic Reorientation

A firm with significant change experience will presumably be more successful at a reorientation because it has some practiced experience at changing the firm's resource base (Zollo and Winter 2002; Helfat and Peteraf 2003). Specifically, the firm may have experience reconfiguring existing resources to new ends, such as developing new operational routines in new markets (Eisenhardt and Martin 2000; Zollo and Winter 2002; Winter 2003; Helfat, Finkelstein et al. 2006). During such processes, firms draw upon existing routines or other fragments of firm experience to assemble new routines and resources. Although some of this activity may be performed *ad hoc* (Winter 2003), repeated practice in assembling new routines and resources increases the reliability of change routines (Nelson and Winter 1982). This may in time lead to change capabilities or dynamic capabilities (Teece, Pisano et al. 1997; Zollo and Winter 2002; Winter 2003).

The process by which firms convert experience into capability is often one of deliberate practice and learning, which is implemented in part by organizational efforts to codify experience. According to Zollo and Winter (2002), the effectiveness of such learning efforts is governed by experience accumulation and the extent of knowledge articulation and codification. Task frequency, task heterogeneity, and causal ambiguity influence the degree to which deliberate learning efforts are likely to be successful. When experience is heterogeneous in the sense that there exists wide "dispersion in the defining traits of the task across multiple occurrences (Zollo and Winter 2002: 347)," then inferences about the most relevant information to codify for learning are more difficult to make, and more likely to lead to inappropriate generalizations. Thus, a higher number of instances of experience are required before reliable

capabilities can be effectively developed. At lower levels of experience accumulation, the 'negative transfer' problem arises—the likelihood that an organization will "learn" an incorrect lesson, codify it, and only later discover that early suppositions about cause and effect were misplaced (Zollo and Winter 2002). This leads to the conclusion that the greater the amount of accumulated experience an organization has in a particular task domain, the more likely they are to have acquired learning that is reliable and successful in application (Levitt and March 1988; Zollo and Winter 2002; Macher and Mowery 2009).

There are numerous ways in which a firm may develop change experience, but in the setting of strategic reorientation the most relevant experience may be that acquired when making prior entries into new business segments. Specifically, repeated entry into new business segments, even on a small scale, may result in valuable lessons about the challenges of unfamiliar territory and produce learning for successfully managing transitions. Then, when a firm faces the challenge of entering a new business segment at an unprecedented scale, prior learning can be activated. Although the firm may not have experience making a strategic reorientation *per se*, experience from prior market entries can result in change routines that go at least part of the way along the continuum toward reorientation capabilities.

Hypothesis 1: *The greater the cumulative experience arising from prior entries into new business segments, the greater the post-reorientation performance.*

Direct Operational Experience and Strategic Reorientation

Operational capabilities—those that permit a firm to 'make a living' in the short-term (Winter 2003)—arise from repetition and practice and form the foundation of efficient performance (Nelson and Winter 1982; Levitt and March 1988; Schulz 2002; Argote 2004). In some cases, a firm may have developed operational capabilities in multiple domains through

diversification (Haveman 1992; Mitchell and Singh 1993; Doving and Gooderman 2008). Such operational capabilities, if accessible, can presumably increase the success of a strategic reorientation, even if they are previously not part of the firm's core business segment (Mitchell and Singh 1995; Helfat and Lieberman 2002). This is because those capabilities embody existing firm experience and so the path between those routines and scaling them to build a new primary business is relatively direct.

Positive performance effects may arise from prior direct experience because such experience limits the investment required to generate new routines. This may explain why some studies have found that closely related experience can have a positive impact on performance when making related changes (Klepper and Simons 2000; King and Tucci 2002; Klepper 2002b). For example, King and Tucci (2002) examined the success of disk drive manufacturers in transitioning between product generations and found that direct experience in making disk drives—even though it occurred in the previous technical generation—proved valuable in predicting performance in the new technical generation. Although the setting for King and Tucci's work is different than a strategic reorientation, their findings—combined with the extensive literature on the value of learning by doing—suggest that prior experience in the target industry of a reorientation provides valuable knowledge that should increase the probability of success. Consequently, a firm should possess greater knowledge about how to operate in a particular new business segment the longer the new segment has been in the firm's portfolio of businesses. This should increase the probability of a successfully reorientation when the firm reallocates resources to make the new business segment the dominant business in the portfolio.

Hypothesis 2: *The longer the new primary business segment has been in the firm's portfolio, the greater the post-reorientation performance.*

Related Experience and Strategic Reorientation

As firm actors engage in the search for new product market opportunities, they view some options as more favorable because those options draw at least partially upon existing routines or capabilities. They may not be a perfect match for an unfamiliar new setting but they share relatedness or overlap of some sort with the new operational routines required to operate in the new market. This may allow existing routines to be transferred, at least in part, to the new setting (Huber 1991; Haleblian and Finkelstein 1999). Possession of related knowledge and routines affects performance in market entry because it lowers the cost of entry, reducing the investments that must be made in developing new routines (Mitchell 1989; Helfat and Lieberman 2002).

Empirical work on strategic change suggests that related experience may be an important source of performance advantage for firms entering new markets (Haveman 1992; Farjoun 1994; Coff 1999; Klepper and Simons 2000). Logically, even when firms shift resources to pursue growth in seemingly "unrelated" industrial sectors they have some basis for the choice of destination. Markides and Williamson (1996), for example, identify five categories of strategic relatedness that firms may consider, including customers, channels, inputs, processes, and technology. Any of these categories of relatedness may be utilized by firms as they make strategic reorientations, even at the one-digit SIC level, where sector-level differences may seem stark. The implication is that firms without direct operational experience in the target industry may be more successful with a strategic reorientation in part because they are able to exploit related resources within their portfolio.

Hypothesis 3: The greater the relatedness between the firm's old primary business segment and the new primary business segment, the greater the post-transformation performance.

Imported Operational Experience through Acquisition

In some cases, firms may lack either operational capabilities from direct experience or re-deployable knowledge from related experience. Under these conditions, firms may choose to buy direct experience by acquiring a firm in the target industry. However, while acquisition may be a quick way to acquire new operational capabilities, it does not come without substantial risks. Acquisitions of companies in "unrelated" industries may lead to lower performance as firms diversifying into an unrelated industry pay excessive premiums, fail to integrate acquisitions, or lack the knowledge or capacity to oversee operations in an unrelated area (Rumelt 1974; Singh and Montgomery 1987). However, it seems plausible that a firm might diversify into an unrelated industry precisely because the firm's core business is not performing well and unrelated markets offer greater profit potential. In this case, an acquisition may be a viable way to enter a new more profitable market, thereby improving firm performance. Acquisition may also be a vehicle for importing new capabilities when the firm does not have operational capabilities in the desired target industry and is unlikely to successfully develop them organically.

Prior research on acquisitions suggests that firms do make acquisitions to fill resource gaps or to pursue new market opportunities (Capron, Dussauge et al. 1998). For example, Karim and Mitchell (2000) studied the use of acquisitions to acquire missing resources and capabilities in the U.S. medical products industry and found that not only did firms acquire missing capabilities via acquisition but they also reconfigured these resources after acquisition, presumably to fill capability gaps. Similarly, Ahuja and Katila (2001) studied the U.S. chemical industry and found that the acquisition of technical capabilities beyond the firm's core technology, but not too far, improved innovation performance.

These studies suggest that acquisitions are a vehicle for acquiring capabilities and knowledge that the firm does not currently possess. Therefore, we expect a positive relationship between acquisition and firm performance following strategic reorientation.

Hypothesis 4: *The greater the number of acquisitions in the new primary business segment prior to strategic reorientation, the greater the post-reorientation performance.*

RESEARCH DESIGN AND METHODOLOGY

Data Sources and Sample

To examine the effect of different sources of experience on a firm's post-change performance, we utilize a sample that includes all public firms listed in Compustat in the 7-year period 1990-1996.[3] A strategic change is operationalized as a firm shifting its primary business to an SIC code that differs from the previous code at the one-digit, or sector level.[4] Distinctions are evident between sectors even in the 2000-3000 codes of manufacturing, and the 7000-8000 codes of Services. For example, manufacturing that begins with a 2000 contains *basic manufacturing* goods such as food, paper, newspapers, textiles, oil and gas, lumber and wood products, chemicals, plastics, beverages and pharmaceuticals. The 3000 codes contain more *complex manufacturing* activities, such as automobiles, aircraft, construction machinery, pumps, computers and computer equipment, refrigeration and heating equipment, household appliances, and semiconductors. The 7000 codes contain mostly non-professional services such as laundries, photography studios, direct mail services, credit reporting, equipment leasing, hotels, etc. The

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[3] Although the sample of changes is limited to this 7-year period, we extended our data gathering efforts for changing firms to two years before and one year following the change in order to estimate the dynamic panel models below.

[4] 0 is Agriculture, Forestry, and Fishing; 1 is Mining and Construction; 2 is basic manufacturing and 3 is complex manufacturing and assembly; 4 is Transportation, Communications, etc.; 5 is Wholesale and Retail Trade; 6 is Finance, Insurance and Real Estate; 7 is largely non-professional services, and 8 is largely professional services and educational institutions; and 9 is Public Administration.

8000 codes contain professional services such as doctors, dentists, chiropractors, optometrists, hospitals, legal services, and also universities and libraries.

Data were assembled from three primary sources. First, we determined how frequently firms change their primary industry by assembling a comprehensive data set of active and inactive organizations during the 7-year period 1990-1996. All financial performance data come from the Compustat Industrial file. However, this file only reports a firm's most recent SIC code for its primary business segment (business from which the organization derives the highest proportion of revenues). Therefore, in order to obtain a reliable indication of primary industry change, we created a second dataset from the Compustat Segment file. The Compustat Segment file has the advantage that it captures reported data for the SIC segments in which the firm operates, as required by the Securities and Exchange Commission (SEC) until 1997. To determine if a strategic transformation occurred, we calculated the share of revenue for each business segment in a firm's portfolio and categorized the segment with the majority share of revenue as the firm's primary segment. We defined a strategic transformation as a firm in which the majority revenue share changed to a different SIC code at the one-digit level.

To obtain a valid sample of firms changing industry, we then filtered firms experiencing portfolio shifts for potential non-significant changes as follows: (1) to eliminate spurious changes due to slight shifts in a highly diversified organization's portfolio, only organizations in which the original primary SIC code segment represented a minimum 33 percent of the organization's total revenues were included in the sample of organizations changing primary industry; (2) to avoid random coding errors or spurious changes, we eliminated organizations that changed to a new primary industry at the one-digit level but then later changed back to the original one-digit code within the sample timeframe; (3) to avoid including firms making a change to a segment

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that was already a major business segment, we required that the old primary business segment represent 50 percent more revenues than the new primary industry (in the firm's portfolio of businesses) three years before the new primary segment emerged as the largest segment, and (4) due to the undefined nature of miscellaneous SIC categories, we eliminated firms changing from or to a miscellaneous SIC code category.[5] Finally, data on acquisitions were gathered from the SDC Platinum database and matched with acquiring firms by firm name and identifier code.

The final dataset is drawn from all active and inactive firms in the Compustat segment file or 12,765 firms, of which 428 firms (3.4%) changed their primary business at the one-digit level sometime within the 7-year period under study. Of those firms that made changes, 49 disappeared in the year following change (either through failure or acquisition).[6] Due to randomly missing data in the Compustat database, panel estimation eliminates an additional 59 firms, leaving 321 firms in panel analyses below.

Models

We test hypotheses by examining the effect of theoretical variables on the change in ROA arising from a strategic transformation. In the present context, the decision by a firm to make a change is an endogenous one, influenced by many of the same factors that are likely to influence performance. Firms are not randomly assigned to either make large performance changes or not to make them. Those that do change may vary from non-changers in ways that systematically bias performance estimates. To control for this, in the first stage of the estimation process, we estimate the hazard of change by constructing a model that includes the factors likely to influence whether firms make such change. The hazard (inverse mills ratio) is then used to

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[5] We also spot checked a number of firms to see if written histories corroborated the changes. A random sample of 20 of these showed that one firm in 20 did not seem to fit with the data. However, it was not clear whether the data was in error or the available historical information had omissions. With the low error rate, we decided to keep all firms identified with core changes in the sample.

[6] An additional 58 firms fail before the end of the sample timeframe.

correct for the endogeneity of this choice (Heckman, 1979). The probability of change model is estimated using a Probit specification and response-based sampling (Xie and Manski 1989; Montgomery and Hariharan 1991), wherein all cases of change are included along with a random sample of approximately equal size of non-changers.

In order to correctly identify the parameter estimate on the inverse mills ratio, several instrumental or other variables (affecting the decision to change but not performance) must be employed in the first stage model that are not employed in the second stage (Shaver, 1998). In strategy research, such instruments can be difficult to find since factors that influence change typically may also influence performance. Alternative approaches include selecting firm-specific covariates that change only slowly relative to the focal management decision (Hamilton and Nickerson, 2003), which is the approach we employ here. Additionally, since strategy choice is a function of expected performance, all variables affecting performance (from the second stage) should typically be included in the first stage strategy choice model (Hamilton & Nickerson, 2003).

In the second stage performance equation, we estimate the influence of theoretical variables and controls on the change in ROA. The general form of the model is

$$y_{it} - y_{i,t-1} = X_{it}\beta_1 + X_{i,t-1}\beta_2 + \eta_i + \upsilon_{it} \tag{1}$$

where y_{it} is ROA for firm i at time t, and X_{it} and $X_{i,t-1}$ represent the current period and lagged values of controls and theoretical variables expected to influence a change in performance. The η_i term is a fixed firm effect and υ_{it} is the error term. Two of the challenges that arise in estimating change in performance effects are adequately accounting for differences between firms in the level of the performance variable and controlling for regression to the mean effects. Regression to the mean effects arise when organizations performing below or above the mean

performance of a population change (Finkel 1995; Greve 1999). Absent any other considerations, probabilistically, performance is likely to move closer to the mean in the next period. Placing lagged values of the dependent variable on the right hand side of the regression equation is the standard technique to control for performance level and regression to the mean effects. Thus, we move $y_{i,t-1}$ to the right hand side and add an additional performance lag to the basic regression model.

$$y_{it} = \alpha_1 y_{i,t-1} + \alpha_2 y_{i,t-2} + X_{it}\beta_1 + X_{i,t-1}\beta_2 + \eta_i + \upsilon_{it} \tag{2}$$

The resulting model structure is suitable for estimating dynamic panel data and is a generalization of commonly employed partial adjustment models or change score models (Finkel 1995; Greve 1999). The model has been successfully employed to model change in other contexts (e.g. Haveman, 1992; Greve, 1999) and is well-established in the econometrics literature (Anderson and Hsiao 1981; Arellano and Bond 1991). The model estimates the year-over-year effects of covariates on changes in ROA. In the present application, we also want to estimate the extent to which theoretical variables may lead to a shock in the year-over-year ROA in the presence of strategic change. Therefore, in addition to introducing a dummy variable S for change (along with the inverse mills ratio), S is also interacted in the year of change with covariates that are expected to influence performance over and above the year-over-year changes.[7] These interacted covariates include both control variables and the hypothesized variables of interest. The full stage 2 model estimated is therefore

$$\begin{aligned} y_{it} = {} & \alpha_1 y_{i,t-1} + \alpha_2 y_{i,t-2} + \sigma\mu_{it} + \gamma S_{i,t-1} + X_{1it}\beta_1 + X_{1i,t-1}\beta_2 + X_{2i,t-1}\beta_3 + \\ & S_{i,t-1}X_{2i,t-1}\beta_4 + S_{i,t-1}Z_{i,t-1}\beta_5 + \eta_i + \upsilon_{it} \end{aligned} \tag{3}$$

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[7] The dynamic panel structure is effective at estimating year over year changes, but not so effective at measuring the effect of changes multiple years out. As a robustness check, we also ran OLS models that pooled observations and estimated averaged ROA three years pre- and post-change. We found that results were qualitatively similar to those estimated using dynamic panel regression. In particular, change experience was the only theoretical variable that had a significant influence on post-change performance in both the dynamic panel regression and OLS regression.

where μ is the inverse mills ratio, X_1 is a vector of current period and lagged values of controls expected to influence year over year ROA, X_2 is a vector of controls expected to influence both year-over-year ROA and also ROA in the presence of change, and Z is a vector of theoretical variables. The use of lagged values of the dependent variable on the right-hand side has certain advantages but unfortunately produces a model with autocorrelated errors, which must be corrected. The most common technique to correct for error structure problems in dynamic models is to instrument lagged dependent variables and other right-hand side variables with further lagged values (Anderson and Hsiao 1981). Firm fixed effects may be incorporated into the model either by employing dummy indicator variables or by first-differencing equation (3), in which prior period values are subtracted from current period values. This effectively eliminates η_i leaving no firm-specific unobservables influencing parameter estimates.[8] Arellano and Bond (1991) build upon the Anderson and Hsiao (1981) first differencing approach to introduce GMM estimators for dynamic panels and this is the approach we employ to estimate (3).

Independent variables

The *experience in target industry* variable (H1) is the length of time the firm has operated in the new primary industry back to the point at which data first becomes available in the Compustat segment files. Recognizing that this may reduce the true magnitude of this variable for some firms, we note that estimates of the variable's effects will therefore be conservative.

Relatedness (H2) is operationalized as the in-sample count of the total number of firms traversing a particular three-digit industry pathway between the old primary industry and the new primary industry. This is then divided by the number of firms in the target industry to normalize

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[8] We also estimated autogressive AR(1) models not shown that employ dummy indicator variables rather than differencing and find no qualitative difference in results.

the counts across industries with different numbers of firms. The frequency of firms traveling a particular pathway between industries is a reliable general indicator of the relatedness between those industries since firms are more likely to make particular moves in aggregate when a basis for relatedness exists. To be sure, the measure may reflect mimetic behavior. However, structural relatedness is a necessary condition for *successful* mimetic behavior in such cases because firms naturally narrow the range of change examples they are willing to imitate based on whether they share similar resources with those firms. Thus, we infer that regardless of the extent to which firms may follow others in making change choices, the frequency with which firms travel particular pathways in making those changes reflects structural relatedness. This is a *survivor principle*-based argument (Stigler 1968; Bryce and Winter, 2009; Teece, Rumelt et al. 1994) based on the notion that what firms actually do makes economic sense. Similar pair-wise counts are the starting basis of the Bryce and Winter (2009) general relatedness index. While the Bryce-Winter index is based on a number of additional statistical adjustments (which cannot be made in the absence of reliable population-level statistics) we correlated the relatedness measure here to the available pair-wise index scores from that index and found a greater than 90 percent correlation for those pairs. This increased confidence that the normalized count method we employ is a reliable indicator of underlying relatedness between pairs of one-digit industries.

Acquisitions (H3) is measured as the count of the number of firms purchased within the new primary three-digit industry in the three years prior to the change. The data is obtained from the SDC database by linking to the parent firm in our database for the relevant years.

Change experience (H4) is the cumulative count of four-digit SIC market entries by the firm since founding up to the change year.

Control Variables

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To control for founding conditions, we compute firm *age* as the number of years from founding as a public firm up to the panel year.[9] *Organizational capital* since founding is the equity or market capitalization generated on the first day of trading at founding as a public firm, adjusted to constant dollars using the CPI (used in stage 1 for identification). To control for path dependence we use logs of *size*; the ratio of property, plant and equipment to employees; and log of the debt-to-equity ratio, which if high may constrain a firm's financial maneuverability. We also include controls for the number of *firms in the new primary* industry and *firms in the old primary* industry, and *median industry profitability* in the new and the old primary industries. These variables help to isolate the effect of change itself on performance by controlling for the differences in states between origin and destination industries (Barnett and Carroll 1995). The variable *performance rank* in the old primary industry supplies a control on the firm's relative market share position, and presumably management ability, in the old primary industry, which we assume is correlated with probability of change (used for identification), but not performance since we're estimating fixed effect models.

Results

Descriptive Information on Firms that Initiate Strategic Transformations

Given the unique character of strategic transformation, in addition to the statistical analysis of the hypotheses, we conducted a descriptive analysis of patterns in the data to illustrate the pattern of strategic transformation in the sample of 428 firms. In support of this analysis and to validate the quality of our data, we also constructed brief histories of 20 firms randomly selected from the sample. The descriptive histories were constructed based on archival data, including SEC filings, media reports and when possible, interviews with corporate executives

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[9] Age is used as a covariate in stage 1 but not in stage 2, since differencing on age produces a value of 1 year over year. Age may also be related more to strategic choice than to performance. It is therefore used in stage 1 but not stage 2 for identification purposes.

(Eisenhardt 1989). These brief histories did support the patterns in the statistical analysis and are referenced where appropriate in the paper.

An examination of the sample of 428 strategic transformations reveals several observations about the process of core change in this particular sample. First, 82 percent of firms brought the new primary industry into the portfolio within three years of making the change. In contrast, only 18 percent (78 firms) held the new primary industry in their portfolio for four or more years prior to change. Preliminarily, this observation suggests that direct operational experience (H1) may have a relatively small impact on a firm's ability to successfully complete a strategic transformation in our sample since firms on average had little experience with the new primary industry prior to change.

Another relevant observation from the data is the pattern of performance that may influence why firms initiate a strategic transformation. Figure 1 shows the average ROA of the 428 firms in the sample relative to the change year (t=0).   Figure 1 shows that, on average firms in the sample have a poor ROA that grows steadily worse as they approach the change year. This suggests that most firms in our data were undergoing a significant degree of distress when they initiated strategic change.[10] Second, Figure 1 indicates that, on average, firms began performing at a higher level during the five years subsequent to the change year. Interestingly, while approximately 57 percent of changers improved their ROA following transformation, on average, firms did not reach positive ROA territory. However, approximately 50 percent of firms did achieve a positive ROA in the year following change.

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[10] We also examined the pattern for firms that were in the data set for the entire pre- and post-change time period (e.g., some firms disappear from the sample during the time period, or we did not have full data in the dataset for firms that changed early or late in the sample period). We did this to check whether the pattern of Figure 1 is being driven primarily by surviving firms (in the upward post-change slope). We found the performance pattern for these firms to be similar to Figure 1, which suggests that survivor bias is not a significant factor influencing Figure 1.

[Insert Figure 1 about here]

The data shown in Figure 1 raises the question of whether the pre- and post-change differences in performance are statistically significant or whether random processes could have produced these patterns. We evaluated the trends shown in Figures 1 and 2 using segmented regression techniques (Wagner, Soumerai et al. 2002) to confirm that the patterns are non-random (available from authors upon request). Based on those analyses we conclude that firms in our sample undergoing strategic transformation follow, on average, a very distinctive and statistically significant ROA pattern as performance first deteriorates, change is made, and performance improves.

Statistical Analysis: Examination of Probability of Change

Summary statistics for estimation variables are listed in Table 1, while Pearson correlation coefficients are listed in Table 2.

[Insert Tables 1 & 2 about here]

Table 3 contains Probit estimates of the probability of strategic change. Included in the model are performance variables from stage 2, as well as additional variables (age, rank, organizational capital at founding) that are more inert relative to performance following change (Hamilton and Nickerson, 2003). While the Probit analysis is used to estimate the hazard of change, the results of the model are interesting in their own right. First, firms that initiate change tend to exhibit low levels of profitability and compete in low profit industries. Not surprisingly, they target more profitable industries in their change attempt. In addition, these firms tend to be younger and smaller, though the effect of age disappears when firm size enters the model (presumably due to the correlation between firm age and size). These results are consistent with the organizational ecology story that older and larger firms will have a lower propensity to

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change. The results also suggest that firms are motivated to flee dying industries (as indicated by the small relative number of firms in the source industry (negative coefficient)) and seek out growth industries (as indicated by the large relative number of firms in the target industry(positive coefficient)). These results are consistent with Bryce and Dyer's (2007) finding that profitable industries attract significantly more new entrants than low profit industries.

Table 3 results also show that firms are more likely to initiate strategic changes when they have prior new market entry experience, have acquisition experience, and find relatedness between the activities of their primary industry sector and a target industry sector. These results are consistent with our predictions since we would expect a higher propensity to change among firms that have attempted changes in the past (via new market entry and acquisition), and in the presence of relatedness. We were initially surprised to find that firms with more operating experience in the new target industry were less likely to change to that industry. This seems to suggest that where major change is concerned creating new routines is more attractive than replicating old ones. When a firm is already underperforming, activities within the portfolio may be contributing to poor performance and thus be viewed as inadequate to rescue performance.

[Insert Table 3 about here]

Dynamic Change Analysis

The results of the dynamic panel analysis of performance are reported in Table 4. Model 1 includes control variables which model the year-over-year influence of covariates on the change in ROA. Model 2 introduces additional controls that have been found to influence post-entry performance (Singh, House et al. 1986), and these are interacted with change in the change

year to test the marginal effect on ROA. Model 3 contains the full model including theoretical variables.

Model 3 fails to provide support for Hypotheses 1, 2, or 3, but does provide support for Hypothesis 4. Hypothesis 1 argued that greater experience in the new target industry would improve post-entry performance. In fact, the sign is negative but the effect is insignificant. Hypothesis 2 proposed that relatedness should influence performance. Again, while the coefficient is positive, the effect is not statistically significant (p-value=0.13), which could be considered very weak support. Hypothesis 3 proposed that acquisition experience should make a positive difference for post-change performance. Again, the sign is in the right direction, but not significant. This result may be due to the fact that, as prior research makes clear, acquisitions are often of questionable value due to price premiums and integration challenges. To further explore the influence of acquisitions, we also tested the effect of acquisition size on post-entry performance and found no significant change in results. Finally, Hypothesis 4 proposed that the greater the experience with new market entry, the stronger the post-change performance. Here the model achieves significance at $p<0.05$. The results suggest that for every prior entry made by the firm, post-transformation ROA improves by 1.6% on average. These results suggest that firms are more successful at reorientation when they have practiced experience at developing new capabilities through multiple entries into new markets.

DISCUSSION

The finding that "change experience" is the only type of firm experience that positively influences the success of a reorientation has a number of important implications. First, it suggests that even when a firm faces significant constraints to change it can improve the odds of success by harnessing the benefits of repeated experience with change itself. Although we do

not directly measure the development of a capability, we do measure repetition of experience with change and find a positive performance effect. This presents the possibility that through repetition and deliberate efforts, experience may produce capability that helps the firm to successfully initiate changes. The type of capability suggested here is dynamic capability, or the capacity to purposefully create, extend, or modify the resource base (Teece, Pisano et al. 1997; Eisenhardt and Martin 2000; Helfat, Finkelstein et al. 2006). These findings provide some empirical validation of dynamic capability but they also suggest that dynamic capabilities developed in one context may be useful when applied to a different context. These findings also suggest that firms wanting to pursue major strategic change should look to draw upon change experience at the individual, team, or organizational levels.

Additionally, contrary to received wisdom on the hazards of organizational change, we find that on average firms that initiated reorientations actually improved their profit performance during the subsequent five-year period. Indeed, 57 percent of all firms improved performance and the 10 organizations with the greatest improvement in performance increased their ROA by a median of 179 percent (three year average ROA after the change year minus three year average ROA before the change year). In contrast, the 10 organizations with the largest decrease in performance dropped their ROA by a median of 97 percent. These data show considerable variation in performance outcomes, but on average firms reversed declining performance and improved performance after a major strategic change. While some of these aggregate statistics no doubt reflect regression to the mean effects, this general finding contrasts with prior research concluding that organizations seldom succeed in improving performance when making changes to core goals, technology, or markets (Hannan and Freeman 1984; Hannan and Freeman 1989; Amburgey, Kelly et al. 1993).

Our analysis also suggests that firms improve performance in strategic reorientation through large-scale resource substitution. For a majority of firms (69%), the change year represents the year that the firm divests the old primary business, which empirically is shown to be a poorly performing business. Thus, firm performance improves for some firms when the old business is divested and profits are primarily derived from the new business. For example, due to declining profits Cherokee, Inc. decided to eliminate its clothing manufacturing operations altogether (SIC code 2330) and become a licensor of its brand for clothing, footwear, and new brands that it acquired in housewares and home furnishings (SIC 6794). It divested its manufacturing plants and headquarters and reduced headcount from 450 to 24. Sales declined from $236 million to $15 million while Cherokee's ROA went from negative -79.8 percent during the three-year period prior to change, to a positive 72.6% during the three-year period after the manufacturing operations were divested. Thus, Cherokee represents a group of firms that were able to quickly improve performance after the change year because they divested the unprofitable operations of the old primary business and shifted resources to a more profitable business. This example suggests that *successful reorientation may be less about changing existing routines and more about divesting old routines while developing or "hiring" new ones.* These results support the research of Levinthal (1997) who suggests that poor performing firms on rugged landscapes find it advantageous to make long jumps to different regions of the landscape rather than to "hill climb" locally. In other words, in certain difficult environments, if the firm hopes to significantly improve performance, it cannot count on small adjustments to its strategy that draw only upon prior experience. Instead, it must rely on its ability to successfully make "long jumps" or more significant reorientations.

While acquisitions were used in 12 percent of the change cases, acquisitions did not increase the probability of success. The low rate of acquisitions is somewhat surprising since by definition firms making extreme changes are unlikely to possess the routines necessary to operate in a new sector. However, most firms were under significant financial stress prior to the change and this may have limited firms' acquisition options. Moreover, we observed a number of firms that entered industries for which machinery could be purchased and operated effectively by relative newcomers because the equipment itself embodied much of the production expertise required. Thus, in some cases it is possible that firms hired equipment or specialist firms to bring technical knowledge for a "turn-key" operation (e.g. Arora, Fosfuri et al. 2001).

We were somewhat surprised to find that leveraging a long-standing "unrelated" business in the portfolio was not, on average, a successful approach. This may occur because even though firms possess greater experience with the new business segment before the reorientation, making a successful reorientation still requires shifting the bulk of the firm's activities and resources to that business. Such a change requires uprooting existing resources and either transplanting them in the new domain or trimming them from the portfolio. If the firm lacks the change capabilities to reshuffle the rest of the resource portfolio, the benefit of existing operational capabilities may be dwarfed by the challenges of transforming the firm.

Finally, while our measure of relatedness had only weak significance in the models, the method of counting the number of other firms traversing particular pathways may prove to be a useful relatedness proxy in other contexts. In addition to structural relatedness, the measure may also reflect mimetic behavior of firms. In some cases firms attempting strategic change may not have direct experience or change experience to draw upon, so the next best option may be to look externally for examples of firms that have attempted a similar change initiative. When they do

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so, they most likely look to firms with resources similar to their own and draw upon the experiences of these firms to receive clues about how to proceed (Huber 1991). Although we argue that this will most commonly be in directions that reflect structural relatedness, it is also possible that strategic transformation will be more successful when firms are able to watch, learn from, and then imitate the path taken by other firms.

CONCLUSION

In this study we examined cases of strategic reorientation to understand what types of firms initiate reorientation and what types of experience, if any, enable firms to successfully change their primary product markets. We found that the only experience that positively impacts the ability to improve performance through a reorientation is a firm's experience with change. Firms with practiced experience at modifying the resource base are more capable at successfully engineering a strategic reorientation of the type we study, even when the types of resources or demands of the new business are different than those encountered previously. These findings suggest that if firms can build dynamic capabilities through repeated change experience, they may be able effect novel changes on a scale that is beyond their historical experience. This raises the question of how far the scope of application of dynamic capabilities extends beyond the settings in which those capabilities are developed, and suggests the need for research on the mechanisms that govern this scope. It also suggests the need for more context-specific study of how dynamic capabilities operate to enact changes in diverse settings.

FIGURE 1
Average ROA Relative to Change Year (428 firms)
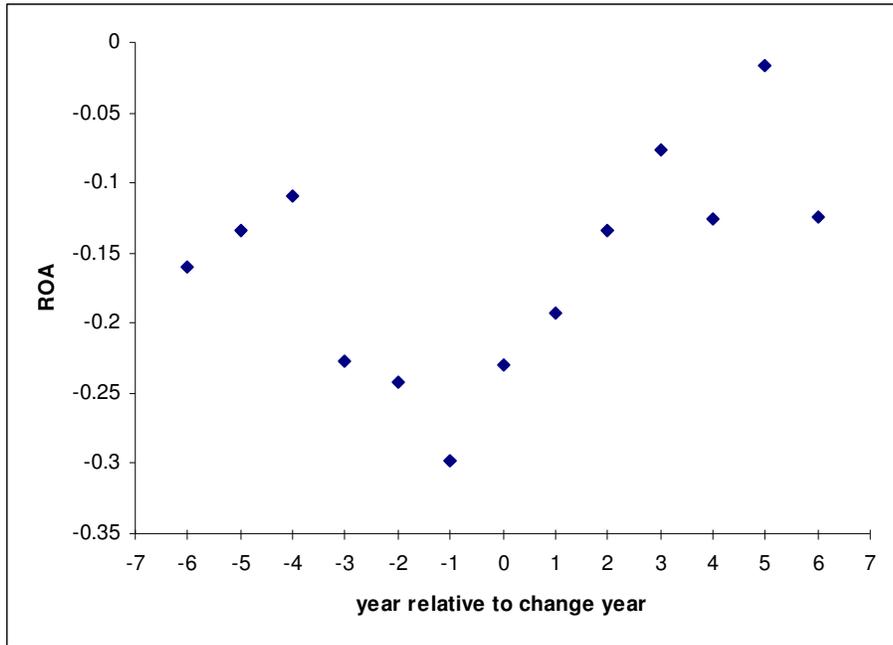
TABLE 1
Summary Statistics for Estimation Variables

Variable	Mean	Std. Dev.	Min	Max
Return on assets	-0.1	0.3	-3.6	1.1
Strategic change (1-digit SIC)	0.1	0.3	0.0	1.0
Industry profitability	0.0	0.1	-0.5	0.3
No. firms in industry	82.2	110.0	1.0	525.0
Age	15.5	12.9	3.0	72.0
Size (ln)	4.5	2.3	-3.6	10.1
Debt-equity ratio (ln)	1.9	1.7	-4.4	9.2
Organizational capital (ln)	10.7	1.5	6.9	15.2
Hard assets (ln ppe/employees)	3.5	1.6	-2.5	11.1
Experience in primary industry	4.3	3.6	0.0	13.0
Relatedness	0.4	0.3	0.0	1.0
Acquisition	0.0	0.4	0.0	6.0
Cumulative change experience	5.7	3.6	1.0	27.0

TABLE 2
Pearson Correlation Coefficients

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Return on assets	1												
2	Strategic change (1-digit SIC)	-0.06	1											
3	Industry profitability	0.18*	-0.01	1										
4	No. firms in industry	-0.13*	0.03	-0.48*	1									
5	Age	0.15*	-0.02	0.10*	-0.11*	1								
6	Size (ln)	0.34*	-0.06	0.25*	-0.18*	0.41*	1							
7	Debt-equity ratio (ln)	-0.04	-0.03	-0.12*	0.25*	-0.14*	-0.20*	1						
8	Organizational capital (ln)	0.16*	-0.01	0.12*	-0.07*	0.33*	0.55*	-0.14*	1					
9	Hard assets (ln ppe/employees)	0.10*	0.04	-0.07*	-0.02	0.14*	0.02	-0.25*	0.19*	1				
10	Experience in primary industry	0.12*	-0.12*	0.06	-0.04	0.37*	0.22*	-0.01	0.25*	0.07	1			
11	Relatedness	0.01	0.59*	0.03	-0.04	-0.02	0.00	0.00	-0.01	0.07*	-0.11*	1		
12	Acquisition	0.00	0.32*	-0.04	0.01	-0.01	0.02	-0.05	0.01	0.03	-0.02	0.26*	1	
13	Cumulative change experience	0.16*	0.02	0.17*	-0.20*	0.39*	0.40*	-0.21*	0.33*	0.06	0.38*	-0.03	0.03	1

*p<0.01**

TABLE 3
Probit Regression on Probability of Strategic Change

Dependent Variable: Strategic change (1/0)	(1)	(2)
Return on Assets in year of change	-0.1265 ***	0.0052
	(0.032)	(0.105)
Return on Assets in year prior to change	-0.1594 ***	-0.0304
	(0.033)	(0.079)
No. firms in target industry	0.0019 ***	0.0022 ***
	(0.0004)	(0.001)
No. firms in source industry	-0.0028 ***	-0.0033 ***
	(0.0005)	(0.001)
Median industry profitability in target	0.9650 *	0.5683
	(0.513)	(0.766)
Median industry profitability in source	-0.9470 *	-0.6777
	(0.535)	(0.901)
Firm performance rank in source	-0.0003	0.0035
	(0.0003)	(0.009)
Age	-0.0064 ***	-0.0019
	(0.002)	(0.005)
Organizational capital at founding (ln)	-0.0143	0.0465
	(0.017)	(0.035)
Size (ln sales)		-0.0776 ***
		(0.025)
Debt to equity ratio (ln)		0.0190
		(0.025)
Hard Assets (ln ppe/employee)		-0.0071
		(0.028)
Experience in target industry		-0.0615 ***
		(0.016)
Relatedness		7.4726 ***
		(0.476)
Acquisition		0.7488 ***
		(0.124)
Cumulative change experience		0.0520 ***
		(0.014)
Constant	-1.1729	-1.7210
	(0.233)	(0.333)
Log likelihood	-1553.67	-521.35

p<0.10*, p<0.05**, p<0.01***

TABLE 4
Results of Dynamic Panel Regression on Performance, 1990-1996

Dependent Variable: ROA (t)	(1)	(2)	(3)
Return on Assets in year of change (t-1)	0.0712	0.0542	0.0587
	(0.081)	(0.081)	(0.081)
Return on Assets in year (t-2)	-0.0107	-0.0167	-0.0148
	(0.021)	(0.021)	(0.021)
No. firms in target industry	0.0005 **	0.0005 **	0.0005 **
	(0.0002)	(0.0002)	(0.0002)
No. firms in source industry	-0.0007 ***	-0.0007 ***	-0.0006 ***
	(0.0003)	(0.0003)	(0.0003)
Median industry profitability in target	0.5263 **	0.5068 **	0.5303 **
	(0.276)	(0.275)	(0.276)
Median industry profitability in source	0.6537 **	0.6595 **	0.6577 **
	(0.303)	(0.303)	(0.304)
Inverse mills ratio	0.0179	0.0213	0.0247
	(0.020)	(0.020)	(0.020)
Strategic change (1/0)	-0.0629 **	-0.2551 ***	-0.3250 ***
	(0.028)	(0.095)	(0.102)
Size (ln sales)	-0.0533 ***	-0.0512 ***	-0.0507 ***
	(0.019)	(0.019)	(0.019)
Debt to equity ratio (ln)	-0.0147 *	-0.0138 *	-0.0144 *
	(0.010)	(0.010)	(0.010)
Hard Assets (ln ppe/employee)	-0.0554 ***	-0.0569 ***	-0.0592 ***
	(0.019)	(0.019)	(0.019)
Size (ln sales) x change		0.0270 ***	0.0186 *
		(0.011)	(0.013)
Debt to equity ratio (ln) x change		-0.0005	0.0008
		(0.018)	(0.018)
Hard Assets (ln ppe/employee) x change		0.0259 *	0.0280 *
		(0.018)	(0.018)
Experience in target industry x change			-0.0074
			(0.009)
Relatedness x change			0.0958
			(0.084)
Acquisition x change			0.0078
			(0.028)
Cumulative change experience x change			0.0156 **
			(0.009)

note: All variables measured at t-1, or year of change unless otherwise designated
p<0.10*, p<0.05**, p<0.01***, one-tailed tests, n=321

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