ANALOGICAL REASONING FROM PRIOR TO TARGET ACQUISITIONS

by

Marcel C. Minutolo

B.A. in Philosophy, University of Pittsburgh, 1995

Graduate Certificate in Asian Studies, University of Pittsburgh, 1996

M.B.A, University of Pittsburgh, 2002

Submitted to the Graduate Faculty of
The Joseph M. Katz Graduate School of Business in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

University of Pittsburgh

2009

UNIVERSITY OF PITTSBUGRH

The Joseph M. Katz Graduate School of Business

This dissertation was presented

by

Marcel Charles Minutolo

It was defended on

May 1, 2009

and approved by

Bopaya Bidanda, PhD

John Camillus (Chair), DBA

Ravindranath Madhavan, PhD

John Prescott, PhD

Luis Vargas, PhD

ANALOGICAL REASONING FROM PRIOR TO TARGET ACQUISITIONS

Marcel C. Minutolo, PhD

University of Pittsburgh, 2009

This study draws upon organizational learning in the management domain and analogical reasoning in the psychology arena to examine the antecedents of acquisition success in a study of 655 firms from 54 industries that conducted 2622 acquisitions from 1991 through 2005. Where previous work in this domain focused on cumulative abnormal returns (CAR) as the measure of performance and ordinary least squares as the method of analysis, this work extends the literature by introducing Tobin's *Q*-ratio as the measure of performance and the autoregressive, integrated, moving average (ARIMA) model with transfer functions as the methodological approach. Earlier research on the influence of prior experience on focal acquisition performance has yielded interesting insights despite variation in findings. However, CAR is a short-term measure that is dependent upon stockholder reaction and does not fully anticipate the long-term fitness of the acquisition event. Ex ante, this study expected to result in a meta-narrative applicable to all merger and acquisition activity that could guide management of an acquisition program through the identification of the antecedent conditions of success. Prior research suggests that the *Q* measure is more relevant to managerial understanding and strategic orientation than insights gained from investor opinion as measured from cumulative abnormal returns. This study's findings suggest that acquisition experience, timing, antecedent performance, and interaction between experience, timing, and performance are all related to focal acquisition results. Further, when ARIMA is used to analyze the data and Q is the dependent variable, additional details and

richer insights about the influence of the independent measures are gained. These findings justify the additional effort and time necessary for managers to use Tobin's Q. Additionally, while CAR does provide a particular set of actionable information, Tobin's *Q*-ratio provides a more robust long-term indicator of acquisition performance, especially where analogical reasoning is the process through which learning is demonstrated.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

DEDICATION

To my loving wife, Christine, and daughter, Ananda.

PREFACE

Acknowledgements in a dissertation can read a lot like acknowledgements at the Grammy's; they can go on too long and include everyone! However, it is all true. Although I will not be able to capture all of the people who made this work possible, I must acknowledge at least a few since some may otherwise never be noticed – I will attempt to be brief.

First and foremost, I thank my advisor John Camillus without whose help I would never have completed this effort. John's gentle but firm guidance, constant correction of my American (rarely English), and ability to bring me down to Earth helped to guide me through the dissertation maze. He also expanded my horizons through the inclusion of several research projects throughout my studies that allowed me to begin to look into the world of Strategy.

Ravidranath Madhavan was not only a committee member but also my advisor. He said to me as I entered the program that although I knew what I wanted to study, I should be "open to the possibility of surprise." This advice proved true since my dissertation ended up somewhere that I would have never guessed myself to be. Further, although I did not use qualitative methods in this effort, Ravi directed my study of qualitative approaches that has served me well elsewhere and continues to influence me in many ways. I continue to be influenced by his admonition at the end of my academic career to keep up in the field, forget my sunk costs in the project, and continue to be open to the possibility of surprise.

Luis Vargas was also both a committee member to me and an academic advisor. He allowed my creative spirits to prosper and assisted me in the application to a DARPA program and an NSF grant. Although I was not awarded either, he guided me and introduced me to the world of grant writing and preparation. Luis was also available to me in domains where, even now, I continue to struggle – programming, modeling, and artificial reasoning.

John Prescott challenged me to stretch my understanding beyond levels that I thought possible for myself and questioned my postmodernist inclinations. Bopaya Bindanda was an incredible addition to my academic studies; his gentle demeanor and encouragement often provided the little bit that I needed to continue.

For my mentor, friend, and one of my best supports, Tom Saaty, I have undying love. Without his continued encouragement and support, I likely would have ended the process long ago. I cannot forget Harry Evans. Although I never took a course with Harry, he listened to many of my ideas and provided feedback while on some long runs (I suspect he did this to keep me slow).

A special thanks to the Institute of Entrepreneurial Excellence at the Katz Graduate School of Business; the First Link program sponsored by the Department of Defense Office of Technology Transfer; and, Applied Manufacturing Technologies Venture, LLC. All of these organizations provided me the opportunity to consult on a variety of projects. These consulting activities allowed me to fund the program and provided me with access to research.

I would never have made it through this effort were it not for the encouragement and companionship of my friends and classmates. There are far too many to list them all. However, I must single out Jaime Rubin de Celis, John Lipinski, Jai Lee, and Adele Queiroz: I owe you more than words. Xavier Veccia's "can do" attitude is inspirational. Carrie Woods "job" is to be

the Assistant Director of the doctoral program, but she knows no boundaries to make my life as a graduate student livable. Carrie supported me emotionally when all hope appeared lost.

The soldiers and families of the Pennsylvania Army National Guard provided me much more than I ever could have given them. The selfless sacrifice that continues to dominate the 28TH ID amazes me. In particular, I am grateful for having worked with LTC Mike Madigan, LTC Jerome Miller, MAJ Timothy Foor, MAJ Brian Kitson, MAJ Shawn Graff, MAJ Reece Lutz, MAJ Robert Donaldson, CPT Christopher Brown, CPT William Ault, CPT Walter Kenneweg, CW2 William Davis, SFC William Roper, SPC Christopher Delany, and countless others.

Finally, I wish to thank my parents, Marcel and Patricia, my sister, Jennifer, and my brother, Christopher who had to listen to me whine for years. To my wife, Christine, and my poor daughter, Ananda, who had to listen to me go on about Mergers and Acquisitions in more detail than they cared to know and who provide my life with meaning – you have my undying love.

I know that much has been omitted and many overlooked and for that I am truly sorry.

1. INTRODUCTION

Mergers and acquisition (M&A) remains an important activity for many large firms because it provides the opportunity to gain both resources and capabilities. Nonetheless, it is well documented that many, if not most, acquisitions fail to realize profits for the shareholders of the acquiring firm and hence understanding the antecedent conditions that predict successful acquisitions remains an important area of research. One dimension that has demonstrated a significant impact on focal acquisition performance is learning from previous M&A activity. The majority of previous research on the effects of organizational learning on acquisition[1] performance adopts a traditional learning curve perspective[2] that suggests that there are positive returns to experience: the more one does, the more one learns.

To measure the impact of antecedent actions on focal performance, researchers in this domain have used event study methodologies that focus on the impact of the announcement to acquire on cumulative abnormal returns (CAR) as the dependent variable[3] using traditional regression (Ordinary Least Squares; OLS) models. Although both the dependent variable (CAR) and evaluation technique (OLS) have yielded interesting results, they remain tentative and incomplete. Toward this end, this dissertation seeks to address both the methodological concerns associated with the use of ordinary least squares as a measurement approach *and* CAR as a measure of learning from previous acquisition experience. In order to execute on the aims of the

[1] For the purposes of this research, I use merger and acquisition interchangeably although there is a substantive difference.
[2] See Barkema and Schijvin (2008) for a review of the work in this domain.
[3] Note that this study is firmly centered in the "learning from negative effects" body of literature within the merger and acquisition domain. This body of literature focuses on five previous studies as the central research examples: Haleblian & Finkelstein (1999); Finkelstein & Haleblian (2002); Hayward (2002); Porrini (2004); Schijven & Barkema (2007).

dissertation, an evaluation of both traditional outcome measures and an alternative measure, as well as an evaluation of traditional OLS procedures and multiple time series analysis with transfer functions are presented.

This journey necessitates a discussion of organizational learning, analogical reasoning, and theories of strategic organization as well as theories around the methodological debates. A brief introduction to the rationale is presented here; chapter 2 develops the theoretical underpinnings associated with the core concepts and the hypotheses; chapter 3 presents the methods, sample, and model development; chapter 4 covers the results of the study; and chapter 5 discusses the results and implications and makes suggestions for the direction of future research.

CAR is a valuable measure because it provides the researcher with interesting information about the announcement, the acquirer, and the target at a specific period of time. The announcement of one public firm to acquire another public firm is a discrete event that is typically highly publicized and the information about the event is readily available. The actual announcement to acquire is, presumably, an unexpected event that will impact the performance of the stock in some direction. Assuming market efficiency, CAR provides a useful proxy for expected performance of the firm's stock returns after the event takes place. However, using CAR as a measure of M&A performance only takes into consideration the stockholders of the firm to the exclusion of other stakeholders. Market efficiency assumptions would have the researcher believe that the market knows what is in the best interest of all stakeholders but recent market activities illustrate, at least anecdotally, that this assumption may be flawed.

There are several underlying assumptions of the event study approach. Previous research has demonstrated that the abnormal returns that are realized by the shareholders in the short run (3 to

11 days) are statistically similar up to a one-year period (270 days) (e.g. Hayward, 2003). With respect to using an event study methodology that employs CAR as the dependent variable, researchers do not go over the one-year window since too many other firm directed actions take place that may impact the returns (e.g. divestures, earnings, etc) and confound the data. However, as others have noted, it may take longer than one year for a firm to realize the synergies that may be gained from the acquisition (e.g. Cording, Christmann, and King, 2008).

Researchers suggest that the short-run measure of CAR is an appropriate approximation of long-term performance based on the efficient market hypothesis. Market efficiency arguments suggest that the stock price of the firm is a sufficient proxy for how the acquirer will perform in the long term and research has supported this argument at least for the one-year window (Hayward, 2003). Given the argument that the acquisition may need longer to realize the true synergies that are anticipated from the activity, it would be helpful to tell a story that goes beyond the one-year window that CAR measures as well as take into consideration other stakeholders. As mentioned above, given the lessons of recent global economic activity, the true health of the acquirer ought to be evaluated rather than the market perception of the event.

To "tell the story" about the ability of a firm to manage the actual acquisition activity it undertakes, it is necessary to use a dependent measure that takes into consideration how an organization directs the uses of its resources; that measure is Tobin's *Q*-ratio. Where CAR measures the wealth that adheres to the stockholder from the acquisition event, *Q* measures the creation of 'wealth' for all stakeholders. Hence, *Q* also captures a firm's corporate social responsibility and sustainability that are omitted in the CAR measure that is limited to stockholder reaction. Since the Q-ratio includes the debt structure, asset valuation, and stock performance, it captures to some degree all stakeholders. In order to maximize the utility

function of all stakeholders, the firm ought to 'learn' from its previous acquisition activity so that future performance improves from both relative and absolute measures which will maximize total economic wealth.

As noted by earlier authors (Haleblian and Finkelstein, 1999), research efforts in the organizational learning domain focus on a narrow manufacturing setting. Findings in the manufacturing domain are difficult to transfer to other arenas where causal ambiguity is higher. Within the manufacturing domain, organizational learning theory is focused on a simple action-result relationship. The simple action-result relationship in the manufacturing setting is also an appropriate test of analogical reasoning. In the manufacturing setting, the ability of the individual to apply problem-solving transfer of an analogous experience to a target problem that must now be solved is relatively simple. The manufacturing environment on which previous organizational learning studies focus is similar to Duncker's (1945) candle problem where the test subject is provided a box of nails, a book of matches, and a hammer and instructed to attach a candle to a wall so that it will burn properly. In this experiment, this particular problem is one of a series of nine in which the desired result is for the subject to put the candle in or on the box, which they then attach to the wall. What Duncker (1945) found was that the test did not elicit the appropriate solution unless the subjects were told that one of their paired associates possessed the ability to help them. Even in this controlled and simple test setting, target problems failed to elicit analogical transfer from similar problems.

Outside of the manufacturing system, however, the effects of antecedent experience are difficult to predict: the body of research on acquisitions is rapidly growing, and findings suggest significant variance in performance (Jensen & Ruback, 1983; Ravenscraft & Scherer, 1987; Loughran & Vijh, 1997; Datta, Pinches, & Narayanan, 1992; Agrawal et al., 1992; Hayward,

2002; Cartwright & Schoenberg, 2006; Deutsch, Keilm & Laamanen 2007). Work in the time series (TS) analysis domain may provide insights into the sources of variation (e.g. Hopwood and McKeown, 1981; Hillmer, Lsarcker, and Schroeder, 1983; Willet and Sayer, 1994).

TS research suggests that performance variation across studies is likely due to both traditional regression-based methods on event history data (Box-Steffensmeier and Jones, 1997) and differences in outcome measures used to demonstrate acquisition success (Schoenberg, 2006). With respect to problems attributed to methodology, Box-Steffensmeier and Jones (1997) found that traditional regression-based methods break down in cases where time-dependent events occur due to right-censoring and time-varying covariates. Traditional regression methods (i.e. ANOVA, OLS, etc.) are inappropriate in time series studies since the data are often dependent upon previous events, thus violating assumptions of independence of observations.

With respect to sources of variation associated with outcome measures, Schoenberg's (2006) evaluation of four common measures of acquisition performance demonstrates that all but one of the measures fail to take into account the long-term success of the event. The one measure that accounts for long-term performance suggests that acquisitions frequently fail, leading to subsequent divestiture (Porter, 1987) but may not take into account profit taking (Kaplan & Weisbach, 1992) or responses to environmental change (Capron *et al*., 2001). These findings further suggest that acquisitions are highly risky decisions (Haspeslagh & Jemison, 1991; Pablo et al., 1996; Sanders, 2001), and that, in particular, acquisition behavior that entails aggressively pursuing large numbers of acquisitions may be indicative of higher levels of risk taking by top management teams and may be a result of managerial hubris (Ahuja & Katila, 2001), differences in compensation structure, or misattribution of success and failure of previous attempts. Given the mixed results and high level of risk taking, one might expect that acquisitions should be

undertaken only by highly skilled individuals; i.e., those who have learned from previous attempts.

According to organizational learning theory, firm behavior is driven by routines that stem from experience (Nelson & Winter, 1982) and performance feedback (Greve, 2003). Furthermore, routines are only developed when experience is dedicated to a particular task which implies that the greater the antecedent experience directed toward a particular task, the more positive the consequent performance due to the probability of identification and retention of positive traits. Proponents of organizational learning grounded in routine development literature assume that the 'process' of learning is independent of the outcomes of antecedent actions (Levitt & March, 1988; Nelson & Winter, 1982). However, proponents of organizational learning grounded in the performance feedback literature emphasize the role of the performance outcomes of antecedent activities on future behavior (Greve, 2003).

Antecedent events form the basis of analogical reasoning that facilitates the decision making on the part of the acquirer. Under analogical reasoning, when the firm is faced with a target acquisition, it looks to analogous acquisitions that may enable the firm to adapt a known solution procedure for use with the target acquisition (Novick, 1988). Analogical reasoning is dependent upon the firm's ability to encode previous activities so that it may retrieve solution sets to focal acquisition attempts, thereby eliminating the need to develop new procedures to address the focal event. The activity of encoding 'learning' from an event is referred to as a transfer effect.

In the psychology literature, a transfer effect refers to performance of consequent activity that is influenced by antecedent events (Finkelstein & Haleblian, 2002). Furthermore, research has identified two types of transfer effects: positive (Cormier & Hagman, 1987) and negative

(Novick, 1988). With respect to positive transfer effects, researchers suggest that where antecedent actions resulted in positive performance, the individual credits the action to the result and when confronted with a similar situation, takes the same action. Conversely, with respect to negative transfer effects where an antecedent action resulted in negative performance, when an individual is confronted with a similar situation in the future the individual will not take the action(s) that was linked to the negative outcome in the antecedent event. Additionally, Gick & Holyoak (1987) found that, regardless of outcome, as event similarity increases, success of transfer increases.

Where research in the psychology literature focuses on the individual as the level of analysis (Dubin, 1978), this work examines whether negative transfer effects exist at the firm level in the context of mergers and acquisitions. Although the primary focus of the dissertation is on negative transfer effects, the coding of data facilitates an analysis of positive transfers. Therefore, the impact of both negative and positive transfers is evaluated. Pennings et al (1994) suggested that transfer effects motivate some acquisitions and a growing body of research has focused on the antecedent conditions of transfer effects (e.g. Haleblian & Finkelstein, 1999; Finkelstien & Haleblian, 2002; Hayward, 2002; Porini, 2004). Yet, the results remain inconclusive. During the period from 1997 to 2006, over 356,000 mergers and acquisitions with U.S. and non-U.S. targets took place with a total value of over $28 trillion (U.S.) with an average acquisition cost of $172M. Given the quantity and value of acquisitions as well as the large commitment of resources, identification of key success factors remains a topic of interest. Acquisitions are complex events, and key success factors are causally ambiguous (Haspeslagh & Jemison, 1991; Hayward, 2002), which makes clear identification of what leads to success illusive. Since organizations continue to view acquisitions as methods to build and maintain competitive

advantage by achieving economies of scale and scope, as well as for knowledge transfer and cooperative learning (Iyer & Miller, 2008), clear identification of the antecedent conditions of transfer effects in this context is important.

There is conceptual and empirical justification for applying the individual concept of transfer effect to the firm level (Levitt & March, 1988). Studies in psychology found that individuals improved their performance on manual tasks with repetition (Thurstone, 1919). In the industrial setting, researchers discovered that productivity increased as the same unit was repeatedly manufactured (Wright, 1936). Some studies have documented the effects of routines and have shown that prior acquisition experience affects subsequent acquisition behavior (e.g. Amburgey & Miner, 1992; Baum et al., 2000). For a variety of reasons, acquisitions represent a particularly appropriate firm context in which to study transfer effects (Finkelstein & Haleblian, 2002). First, the success rate of acquisitions is mixed (Haspeslagh & Jemison, 1991). The mixed success rate of acquisitions implies that both positive and negative transfer occur. Unlike most other strategic actions, acquisitions are discrete and easily discernible events; both the occurrence and timing of an acquisition are relatively well known, which facilitates the research of transfer effects on future firm performance. Finally, the empirical acquisition literature has essentially relied on financial, economic, and strategic rationales, and much less on organizational explanations, to understand acquisition success and failure (Larsson & Finkelstein, 1999). For all of these reasons, studying transfer effects in acquisitions holds some potential to yield new insights on an important question to scholars in strategic management.

To address the variation in findings across studies and to gain better understanding in the acquisition literature, a distinction between the effects of acquisition experience and performance feedback is made and an alternative measure of acquisition performance offered. This study

tested the research questions using longitudinal data (1991–2005) in a sample of 655 firms who conducted 2622 acquisitions. The guiding research focus is that firms learn from their previous acquisition experience; the more they do, the better they are at execution of future M&A. This research seeks to define the conditions in which experience leads to adaptive performance (Weick, 1979; Levitt & March, 1988; Hayward, 2002; Barkema & Schijven, 2008) through an alternative measure of acquisition outcome: Tobin's *Q*-ratio.

Business publications and researchers alike have claimed that firms with previous acquisition experience outperform those without (Lubatkin, 1983); despite this fact, acquisitions are often unsuccessful (Porter, 1987). Given both the prevalence and ease with which CAR is used and calculated, an alternative measure would have to tell a different story of the transfer effects and be more informative of the long-term success of the acquisition. Therefore, different findings are expected on at least some of the variables in order to justify the use of *Q*. This research has the potential to further the understanding of the relationship between CAR and *Q*, refine understandings of negative transfer effects on acquisition performance, the conditions under which a firm better identifies future acquisitions, and improve our understanding of what actions firms may take to improve their acquisition programs.

The remainder of this dissertation is structured to explore why some firms outperform others in acquisition activity while others remain unsuccessful despite previous experience. The following section develops the theoretical basis and hypotheses of this effort; in the next section, a discussion of the sample and methods is presented; findings from a traditional event study are presented followed by the findings using *Q* as an alternative measure; comparison between the two measures are presented; and finally, conclusions and future areas of research are discussed.

2. THEORETICAL FRAMEWORK AND ANTECEDENT LITERATURE

There is no disagreement in the merger and acquisition (M&A) literature that there is heterogeneity of performance between firms. However, there is still much disagreement on what the causes of variation are in M&A performance. As mentioned above, the underlying assumption for this research is that learning from previous M&A activity accrues to the firm and influences future M&A performance. However, direct observation of when learning takes place is difficult and hence researchers look for proxies of when learning takes place. Learning, as defined here, takes place when we witness a change in behavior (Argyris & Schon, 1978; Fiol & Lyles, 1985) that leads to positive performance. In fact, there are many anecdotal illustrations that this takes place. For instance, consider the following statement from U.S. Bancorp's annual report:

> "Large banking acquisitions are not among our priorities; however, we continue to look at smaller fill-in opportunities to expand distribution in existing markets. We have been very successful at this type of expansion. In February 2007, we completed the acquisition of United Financial Corp., the parent company of Heritage Bank in Montana. The transaction strengthened U.S. Bank's franchise both by enhancing its existing market presence in certain regions of Montana and expanding into new regions of the state" (U.S. Bancorp, 2007: p. 12).

In this statement, the board of directors attempts to communicate two things to its investors. The first statement is that the acquisitions are not part of their traditional competitive repertoire (Ferrier and Lyons, 2004) but that they have executed them successfully in the past. Second, the U.S. Bancorp attempts to communicate their ability to reason analogically – namely, that they can identify a target problem, apply source solution sets to the target problem, and thereby

strengthen their overall market position. Finally, they assume short-term returns translate to long-term performance: "The *transaction strengthened* U.S. Bank's franchise."[4]

Although some learning is maladaptive, an organization is interested in only those behaviors that lead to improved performance. Therefore, the organization is more likely to reduce to practice only those activities that they *believe* lead to better results. Previous research has relied mostly on CAR as an indicator that learning from previous M&A experience has taken place. The primary contribution that this dissertation seeks to make is to suggest that Tobin's Average *q*-ratio (*q*)[5] may be a better indicator that learning from previous M&A activity has taken place.

In this section, a brief summary of some theoretical perspectives on M&A followed is presented followed by a discussion of analogical reasoning and how problem similarity and expertise relate to the act of reasoning from past experience to a focal application. The following section contains a discussion on the value of *Q* as an indicator that learning from antecedent acquisition activities has taken place and influenced behavior on a focal acquisition. Further, the anticipated relationship between CAR and *Q* is presented. Following the discussion of *Q*, the theory underlying the dissertation is developed. The following chapters present the sample and methods; finally, a discussion of the results and conclusions with suggestions for future research is offered.

2.1. THEORETICAL PERSPECTIVES DRIVING M&A ACTIVITY

An organization might elect to expand business operations in a variety of ways. The literature is filled with mechanisms to grow an organization: greenfield projects; joint ventures;

[4] Emphasis added.
[5] NOTE: Where *Q* is used, I refer to Tobin's Q-ratio as the formal derivation; where *q* is used, I refer to Chung and Pruitt's (1994) average *q* calculation.

intrapreneurship; R&D; and countless others. There are many figures for the rate of M&A failure but the one thing on which most agree is that on average, M&A activity fails to generate wealth for stockholders of the acquiring firm. Therefore, one must wonder why firms continue to engage in M&A activity at the rate they do. There are several theoretical perspectives that offer insights into why M&A activity occurs. In this section, a brief discussion of some of the rationales for these events is presented and includes the transaction cost economics perspective, the resource based view of the firm, institutional theory, and strategic choice. Although this is not an inclusive list, it provides some insight into the rationale for why management may elect to execute M&A.

2.1.1. Transaction Cost Economics

Economic perspectives of why merger and acquisition activity takes place, such as the transaction cost economics (TCE) framework, have provided the dominant theoretical foundations. Researchers in the TCE domain focus on how organizations should structure their activities to minimize costs relative to production functions in order to achieve Ricardian rents. Williamson (1975, 1985) identified markets and hierarchies, and later interorganizational forms (Williamson, 1991), as alternative modalities of institutionalizing organizational activity. TCE proponents stipulate that a firm decides to acquire assets when the ongoing costs of conducting business in the market are higher than the costs of organizing activities within the firm (Coase, 1937; Williamson, 1975, 1985). The concept and timing of the acquisition of assets in the market with respect to M&A activities will become particularly important when one takes into consideration boundary conditions of *Q*.

In fact, in one study (Villalonga and McGahan, 2005) have found that the organizational structure and prior acquisition experiences of the firm have implications for overall performance. The authors found that where prior acquisition experience led to higher rates of dissimilarity

between target and acquirer, the cost of managing the acquisition increased. Coase (1972) argued that internal costs to the organization are higher when there is greater dissimilarity between activities. Although the organization might view the introduction of diversified activities as business enhancing, the act might prove too costly to manage from the TCE perspective. However, when prior acquisitions are more similarly related, proponents of TCE argue, the cost of management decreases due to experience, economies of scale, and other commonalities that result in greater ease of integration. Hence, the argument for M&A is that as firms integrate similar activities, they reduce overall transaction costs and therefore gain a comparative advantage. One might argue then that all industries will reduce to a single company as they mature since greatest efficiency is achieved through singular operations.

Although there is one argument from the TCE perspective for decreased transaction costs through increased concentration driving M&A activity, there is a competing position that states that direct competition between the acquirer and the target results in the need to increase protective (i.e. integrative) governance structures that induce the desired actions (Villalonga and McGahan, 2005); this results in an increase of overall transaction costs.

One final argument that coincides with the organizational learning perspective is that as firms conduct more M&A, they become better at the process overall. Therefore, the value that the organization generates, from both a stockholder and stakeholder perspective, through the acquisition activity increases as previous experience increases. There are several underlying assumptions in this argument that are developed throughout this work, but the framework is that the organization codifies and develops heuristics that facilitate analogical reasoning: management is able to apply the source problem set to target problems. Stated differently, management, through repeated experience with various governance structures, learns how to

execute them better and therefore lowers overall transaction costs (Dyer and Singh, 1998; Haleblian and Finkelstein, 1999; Anand and Khanna, 2000; Hayward, 2002; Villalonga and McGahan, 2005).

2.1.2. Resource Based View

From the resource based view (RBV) perspective, rare and difficult to imitate internal firm resources are key drivers of an organization's competitive advantage (Castanias and Helfat, 1991). Penrose (1959) and Teece (1980, 1982) claim that a firm's entry into new product markets results from excess capacity in valuable resources that may be transferable across firms but subject to market imperfections (Penrose 1959; Teece, 1980, 1982). Proponents of the RBV stress the role of intangible capital such as organizational technological and marketing resources, which are particularly vulnerable to appropriation by partnering firms in alliances or in market exchanges. As a result, firms may choose more integrative forms of governance such as acquisitions when their intellectual capital is valuable, rare, inimitable, or organizationally dependent (VRIO) (Barney and Hesterley, 2006).

Alternatively, the need to acquire resources creates dependencies between organizations and outside units such as suppliers, competitors, creditors, governmental agencies, and others. Barney (1986) introduced the concept of the "strategic factor market" which he defined as "a market where the resources necessary to implement a strategy are acquired" (p. 1231). From this perspective, strategic resources are those that have the potential to contribute to an organization's ability to achieve, at least in the short run, a comparative advantage in an industry. Barney (1986) suggests that firms can use tools such as Porter's Five Forces, Value Chain Analysis, or other methodologies, to develop better expectations about the future value of strategic resources.

Furthermore, Barney (1986) suggests that acquisitions represent one case of strategic factor markets: the market for companies.

Since the returns to an organization are dependent upon the cost of the resources necessary to deliver to the product market, the existence of strategic factor markets has significant implications. The strategy that a firm attempts to execute, its theory about how it will gain a competitive advantage in an industry, is dependent in part on the strategic factor market. For instance, if a firm wishes to be a low-cost leader but the price of input of a strategic factor is more costly to the firm relative to its competition, then the firm will have difficult time in the execution of the strategy. Furthermore, the cost of the resource will be dependent on the competitive characteristics of the relevant factor market (Barney, 1986). Assuming that strategic factor markets are perfectly competitive, then it may be illustrated that the full value of the product-market strategy is anticipated *ex ante* and the firm is only able to obtain normal returns. It may further be demonstrated that the firm can only achieve above normal returns when the cost of acquiring a key input is less than its economic value.

Given the above argument from the RBV perspective, one might make several statements regarding why M&A activity takes place. First, a firm might be expected to pursue an acquisition if the anticipated cost of acquisition of the resource is less than the purchase of the resource in the strategic market for that good; i.e. if the expected cost of the firm in the strategic market is less than the expected cost of the on-going purchase of the good in the strategic factor market for the input. This implies that the firm is able to accurately value, execute, and manage the ongoing operations of the source of the resource. Therefore, we would expect that an organization that has executed M&A in the past will outperform a firm that has little to no experience in M&A activity. When an announcement is made by an acquirer that it wishes to acquire another firm, it

makes a statement about its expected value of the target; namely, that the value of the target is greater than the value of the parts in the market. The outcome of the acquisition has one of two potentials: first, a positive return which suggests that the acquirer had an accurate, positive perception; or, second, a negative return in which case the acquirer's perception of the target was incorrect. This makes no statement to the degree or drivers but only to the directionality of the perception.

Second, firms will deploy slack resources in an attempt to gain increasing control over valuable inputs into their production function. Through a tactic that increases concentration of ownership of a key input by a single company, the firm that owns the primary source of that input relieves its dependence on other suppliers and increases its own supplier power as a provider of the input. Therefore, the market would expect to see firms that perform well under this argument to become increasingly concentrated. From an organizational learning perspective, this firm would increase overall performance through improvements in two dimensions: first, they would improve their ability to acquire a specific business line; second, they would improve their efficiency and effectiveness of business with respect to the dominant business line. The overall result is that this organization becomes specialized and therefore generates firm specific advantages that may not be easily copied.

Additionally, the strategic choice perspective grew out of economic arguments that firms pursue M&As to increase competitiveness or market power (Burt, 1980) through the erection of entry barriers or the creation of monopoly-type influence (Porter, 1985); to increase political power or the ability to influence governing bodies; to maximize firm's abilities to offer attractive products or services; and, to increase efficiency in research, production, marketing or other functions.

A competing perspective, however, is that the organization attempts to acquire a diverse range of inputs into their process so that they have some ownership of all aspects of their production function. In this case, the market would expect to see firms increasing their generalist abilities and a decrease in overall business concentration.

Beginning with Pfeffer's (1972) seminal study, resource dependence theorists argue that organizations must acquire control over critical resources in an effort to decrease dependence on other organizations and to increase the dependence of other organizations on them. According to this theory, M&As are mechanisms to gain access to strategic factors, increase firm's power relative to other organizations, and reduce competitive uncertainty created by resource dependencies among firms. In addition, integration of complementary resources between an acquiring firm and a target may be difficult if not impossible for competitors to imitate (Teece et al., 1997), thereby strengthening the "O" portion of the VRIO[6] framework. More specifically, this outcome is achieved when integration of two firms' resources makes it more difficult for competitors to compete against the merged business than to compete against them as individual entities. Research shows that integrating complementary rather than highly similar resources through an acquisition increases the probability that the newly formed firm will be able to create economic value through its operations (Harrison et al., 1991).

Integration of two firms is a difficult process, especially where the key resource is knowledge based. However, learning from target firms and building new capabilities are yet other reasons that firms acquire targets since, from the learning theory perspective, knowledge is viewed as a firm's principal resource (Vermeulen and Barkema, 2001) and M&A as increasing opportunities

[6] Valuable, Rare, Inimitable, and Organization.

for organizational learning (Hamel, 1991; Kogut, 1988). Knowledge transfer from targets to acquirers is facilitated if companies make the same type of acquisition repeatedly due to experiential learning effects (Amburgey and Miner, 1992). Target companies often have unique employee skills, organizational technologies, or superior knowledge that are available to the acquiring firm only through acquisitions. In general, exploitation was the best for many acquisitions in 1980s and 1990s while financial reasons influenced acquisitions in the 1970s. It appears that capability-building acquisitions are the dominant reason for many acquisitions in the first decade of the twenty-first century (McNamara, Haleblian, and Dykes, 2008).

2.1.3. Tangential Perspectives

Institutional Theory and Embeddedness

Supporters of the institutional theory perspective suggest that environments impose pressure on organizations to appear legitimate and conform to prevailing social norms. These pressures motivate firms to merge to be in agreement with the prevailing rules, requirements, and norms of their business environments (Oliver, 1990). Firms in an industry may persist, over time, in a pattern of merger activity independent of actual transaction patterns. In other words, once firms begin to engage in M&A they may continue to do so for inertial (Amburgey and Miner, 1992) or institutional reasons. This view suggests that mergers occur because of repetitive momentum concerns for legitimacy (Amburgey and Miner, 1992; DiMaggio and Powell, 1983). In fact, Jovanovic and Rousseau (2002) found that the M&A waves of the 1900's, 1920's, 1980's, and the 1990's were driven by profitable reallocation opportunities. The profitable decision to make the acquisitions during these waves was driven, in part by bandwagoning effects (McNamara, Habelian and Dykes, 2008), but also due to institutional expectations. As will be

demonstrated later, firms whose *Q* is above parity (1) are expected to acquire until their *Q* reaches unity.

Several theories suggest that prior relationships between the focal firm and the target or partner are important to governance choices. Social embeddedness theorists suggest that two firms are more likely to engage in an alliance or merger when they have a history of prior relationship (Powell, 1990; Gulati, 1998, 1999; Podolny and Page, 1998). The embeddedness of firms in social networks enhances trust, which can be promoted by prior ties. Most think that acquisition behaviour diffuses through the network of interlocking directorates (Haunschild, 1993; Davis et al., 1995; Haunschild and Beckman, 1998). When a corporation's managers sit on another firm's board of directors, they create an interlock between their corporation and the other firm. In the process, they obtain access to information about and from that firm, which might provide them with knowledge about diversifying acquisitions, the financing strategies and takeover tactics used to complete them, and the identity of willing or vulnerable targets. They also obtain formal authority over that firm, which might provide them with influence over people who control access to capital or hold decision-making authority over specific desired targets. On the contrary, Palmer and Barber (2001) found little evidence that the number of boards on which a corporation's managers sat influenced the number of diversifying acquisitions. This contradicts previous findings (Haunschild, 1993; Davis, Diekmann, and Tinsley, 1995; Haunschild and Beckman, 1998) that suggest that interlocks and interlock centrality were associated with the pursuit of acquisitions.

RBV, institutional theory, TCE, interlocking boards, social embeddedness, and resource dependence theorists suggest rationalizations for why M&A activities take place. However,

all of the preceding theories are dependent upon the ability of the organization to learn from acquisition activity and to conduct effective analogical reasoning from source to target problems. Where a firm has no previous experience in M&A, they are completely dependent upon an 'expert' in order to guide them through the maze. Each of the theories presented in this section have suggested a condition where one might expect to see a firm engage in M&A, what the expected performance might be to the acquirer, and what the firm expects to gain. In the following section, mechanisms that allow a firm to maximize on its previous M&A activity in order to generate expertise and realize synergies are discussed.

2.2. ANALOGICAL TRANSFER

Analogical reasoning is the act of retrieving an analogous problem from previous experience (called a source problem) to solve a target problem (Novick, 1988). Retrieval of source problems to solve the target precludes the necessity of constructing new solutions, which is an important benefit of analogical transfer. Since analogical reasoning precludes the necessity for the development of new paradigms, it speeds decision making and offers the opportunity to decrease action time and reduce overall expense to the firm. However, analogical reasoning is often reduced to the form of a polysyllogism typified by the structure:

All men are mortal;
Greeks are men;
Therefore, Greeks are Mortal. (Bochenski, 1951).

Although the above example is a simple syllogism, the overall structure maintains where the reasoning is analyzable into two parts: the first part contains categorical propositions such that the final (conclusion) is presented as following from the proceeding; and, in the terms, the one in

the middle (the middle term) is common to the premises, the second term is common to the conclusion and one of the premises, and the third is common to the conclusion and the other premises.

Although analogical reasoning provides many advantages, such as speeding decision making and increasing productivity, there are several costs that offset the potential benefits. First, the problem solvesr may not find an appropriate solution state because they have not had similar problems in the past or because they fail to appropriately match the source problem to the target. The first problem is analogous to Plato's aviary analogy[7].

In the aviary analogy, the mind is explained as an aviary full of birds where each bird represents a unit of knowledge or memory. In this model, to teach is to give away a bird to someone else and to learn is to stock one's aviary. Remembering, then, is to enter the aviary and catch birds. When a bird is caught, the individual is said to have remembered (i.e. recalled a previous source problem). This analogy is similar to the explanation in Cowen's "Embedded Process Model of Working Memory" (1999). In this model, Cowan uses several metaphors to describe his belief in the connection between working and long-term memory. One of these is a dark room with a single spotlight shining. Wherever the spotlight shines, working memory is present and everything in the dark is long-term memory. In this way, Cowen resembles Plato's division between birds in the aviary and birds that one has caught (remembered).

Presumably, to catch a bird is to bring a long term memory into working memory. Fault is soon found with this metaphor and the character Socrates attributes this to hastily rushing towards an answer without first understanding the true nature of knowledge. Similarly, one might say that

[7] See Lee (1939) for a full discussion of Plato's aviary analogy.

since the majority of M&A activity fails to achieve profits for the acquirer, the acquirer failed to understand the true nature of the acquisition. An interlocutor might argue that it is not the acquirer that failed to understand the true nature of the target but rather it is the researcher who has failed to understand the true nature of the research environment. Hence, in the case of the first potential pitfall of analogical reasoning, the decision maker may fail to "catch the appropriate bird" or realize its relevance.

The second 'cost' associated with analogical reasoning is that the search for a source problem to apply to the target might only yield distracter problems that are only superficially similar to the target. For example, when the acquiring firm looks for targets, management often tries to remember other acquisition experiences. Because two acquisitions need not require the same management principles for successful completion (e.g. Schweiger and Goulet, 2000), the retrieved problem might not be relevant or even mislead the firm; this is equivalent to "grabbing the wrong bird in the aviary".

Finally, even if the firm is able to retrieve an analogue, the time spent on the search may be time wasted if the firm does not know how to use the information. More generally, analogical transfer may be difficult for a firm to implement because it requires that the organization attend to 'noise' that distracts from the problem that needs attention (Holyoak, 1985). With respect to a problem state, an individual's experience exists on a spectrum from developed expertise to novice and the problem from ambiguous to simple. We might expect that as problem ambiguity increases, experts are more capable of appropriate analogical reasoning but where the problem is defined as 'simple' reasoning is as productive for novices as it is for experts. Success or failure in analogical reasoning is attributed to two types of transfers: positive or negative. Whether the

transfer is negative or positive depends on the processes involved, which include problem representation, search and retrieval, mapping, and procedure adaptation (Novik, 1988).

2.2.1. Positive Transfer

Positive transfer is said to occur where the problem solver experiences positive results from an act and is able to apply the actions that lead to positive performance to a future target problem. The idea is that the individual is able to retain the details that lead to the positive outcomes. Research in the analogical reasoning domain stipulates that where the source and target problems share both structural and surface features, spontaneous positive transfer should occur regardless of the expertise of the problem solver (Novik, 1988). The structural features of a problem are determined by how the quantities of the problem are related to each other rather than by what the quantities are; the latter is surface information.

However, where the source and target problem share a structural but not a surface relationship, one expects that experts are more likely to realize positive transfers than novices. In this case, the source is a remote analogue (Holyoak, 1985), and the search requires more depth. One expects that the greater the number of previous acquisitions, the more robust the source set from which to conduct analogical reasoning. In these cases, the target problem lacks cues that may lead to the identification of appropriate source problems. Therefore, the problem solver has to search more deeply for an analogy.

2.2.2. Negative Transfer

Negative transfer is said to occur where the problem solver fails to achieve positive results and encodes the reasons for failure such that she is able to apply the ‘lessons learned’ to a future event. This type of transfer occurs because the source (a distracter problem) and the target share

surface but not structural similarity. In this case, Novik (1985) found that novices experience more spontaneous negative transfers than did experts. First, the problem solver might lack the appropriate expertise; i.e. the problem solver might lack a source problem to apply to the current state. Second, the individual may be unable to identify / retrieve a relevant source problem. On the surface, acquirers may identify similar characteristics between a potential target and a previous. For instance, the source and the target may both share SIC, size, or other relevant information. However, the two firms likely diverge on many key attributes such as distribution networks, rare factors, and human resources (to name a few). Nonetheless, the surface features provide a cue to the problem solver as to the potential source problem that provides an appropriate analogue.

2.3. TOBIN'S Q-RATIO AND CAR

Tobin's *Q* is an increasing function of the quality of a firm's current and anticipated projects under existing management (Lang, Stulz, and Walking, 1989). Furthermore, in the body of literature that looks at the market for corporate control, researchers have found that the market expects firms with high *Q* values to acquire while firms with low *Q* values should not (Blose and Shieh, 1997). Using an event study methodology, Blose and Shieh (1997) find that there is a significant positive relation between *Q* ratio and stock market reaction to capital investment announcements. However, Lang, Stulz, & Walking (1989) found that for M&A, the relationship between CAR and *Q* is non-linear and note that a *Q* ratio of 1 is an important boundary condition.

A *Q* value of 1 marks an important boundary condition for a firm since the market expects firms with a *Q* higher than one to make some form of capital investment and those below 1 not to invest (Blose and Shieh, 1997). The implication is that a firm will continue to invest its slack

resources until its *Q* value reaches unity, at which point the management of resources is exactly equal to the replacement costs of the underlying assets. Therefore, we would expect firms with *Q* greater than unity to conduct slack searches (Iyer and Miller, 2008; Levinthal and March, 1981) for investment opportunities until all slack resources are exhausted. Additionally, Iyer & Miller's (2008) findings suggest that low-*Q* firms may conduct problemistic searches for potential acquisitions in order to address deficiencies while high *Q* firms conduct slack searches in order to redeploy these resources. This may account for both ends of the search process and why researchers have found that there is a correlation between merger waves and variance in *Q* ratios (Jovanovic and Rousseau, 2002).

If it proves to be the case that unity is as significant a boundary condition as previous research suggests, then a $Q_{>1}$ firm is said to be value maximizing. From a management perspective, the $Q_{>1}$ firm would benefit greatest so long as it stays above unity and continues to acquire. In order for the firm to stay above that threshold, it is necessary to 'learn' from previous experiences to conduct efficient searches, execute transactions, integrate operations, achieve synergies, and if necessary, divest. However, as discussed below, there is an optimum threshold of both too much and too little acquisition activity where on one side the firm lacks absorptive capacity and on the other end there is organizational forgetting. The first hypothesis may be stated as follows:

> *$H1_{CAR}$: There will be a curvilinear relationship between prior acquisition experience and firm performance.*
>
> *$H1_{q}$: There will be a positive relationship between prior acquisition experience and firm performance.*

As stated, this hypothesis is similar to prior research (e.g. Finkelstein and Haleblian, 2002; Haleblian and Finkelstein, 1999; Hayward, 2002) except that previous research illustrated a curvilinear relationship between firm performance and prior acquisition experience. However,

previous research used CAR as an indicator of learning and looked at a much smaller time window. There are some problems associated with CAR as a measure of acquisition performance. The first problem has to do with the event study methodology and CAR which looks at the *announcement* as the 'event' and does not consider consummation of the announcement as a necessary condition of the acquisition. The second problem has to do with the time horizon. The event study methodology assumes a short period of time in an attempt to reduce the potential confounding of other 'events' that might impact stock performance; this window is typically a maximum of 270 days. In fact, researchers found no difference between 270 days and 5 days after announcement (Hayward, 2002) which does support the market efficiency hypothesis but says nothing of the long-term relationship between market returns and acquisition performance. Hence, it is the announcement effect and not the actual acquisition that others in this domain have measured as a proxy for long-term performance of the 'event.' One study in particular segmented the data in order to address the impact of CAR on managers' decisions to consummate the announcement (Jennings and Mazzeo, 1991). Finally, adjustments for market rate of return and risk are arbitrary with CAR (Fama, 1998) despite Haleblian and Finkelstein's (1999) findings that the risk adjusted measure of CAR and the modified measure are statistically similar. By itself, stock prices represent an arbitrary distribution of shareholder wealth or market value and therefore lack a natural common baseline that allows for comparison across firms or industries (Anderson, Farnell and Mazvancheryl, 2004).

In the short run, 'events' move *Q* up and down (Tobin, 1976), and it is expected, therefore, that there will be a strong correlation between *Q* and CAR around the announcement of the event. *Q*, however, is a measure that is forward looking, risk adjusted, comparable across firms, and grounded in economic theory. AVG-*Q* provides a potential advantage over CAR since it is a

more long-term measure of performance. As stated above, CAR requires a short-term window – maximum of 270 days – whereas *Q* may be a better long-term indicator. Since it may take up to five years to fully achieve the desired effect of an acquisition, *Q* will serve as a better measure of performance rather than announcement. Given the longer window of evaluation and combination of both financial and accounting data, *Q* is not reliant on the same semi-strong market efficiency assumption that CAR does.

2.3.1. Learning by Doing – The Impact of Previous Acquisition Experience

Previous research suggests that an organizational learning epistemology is an appropriate referent for acquisition performance (Ahuja and Katila, 2001). Organizational learning results from the active process of learning from direct experience, interpretation of that experience, and the conservation of the experience for future retrieval (Levitt and March, 1988). The organizational learning paradigm implies that organizations actively engage a learning process (i.e. learning is intentional) and that the process is managed. The organizational learning literature largely uses production measures as a proxy for learning effects (Darr, Argote, and Epple, 1995) that assume related activities. However, research suggests that performance improvement in the production process is not necessarily indicative of organizational learning since the cause of the outcome and learning are often ambiguous (March and Olsen, 1975).

However, while experience may account for learning effects in tactics where the outcome is more clearly measured, it remains uncertain what impact learning has on strategic choices such as acquisitions. If learning curve effects accrue to acquisition performance, there are various factors that may mitigate the gains that would otherwise be realized. Acquisitions are heterogeneous (Haspeslagh and Jemison, 1991; Hayward, 2002; Hayward, 2001), and as such, inferences differ across acquisitions (Haleblian and Finkelstein, 1999). As suggested earlier,

there is significant variation in acquisition performance which affects the intensity with which managers search for inferences from those experiences (Levinthal and March, 1993; Weick, 1979). Finally, there is great irregularity in acquisitions occurrence. Even if firms generate adaptive inferences, those inferences may not be generated and applied in a timely fashion (Huber, 1991).

All this suggests that acquisition experience per se may be insufficient to ultimately ensure superior acquisition performance (Haleblian and Finkelstein, 1999). Instead, such performance will more closely relate to a) the businesses that are acquired, b) the performance of those acquisitions and c) the temporal intervals between the focal acquisition and prior ones. The following sections examine each of these issues in turn.

2.3.2. The Impact of the Similarity of Prior Acquisitions

This section presents the CAR argument that prior acquisitions that are highly similar or dissimilar to one another will negatively relate to focal acquisition performance; and, the *Q* argument that increased focus or concentration results in improved efficiency and hence performance that support the efficient structure hypothesis (Smirlock, Gilligan, and Marshall, 1984). According to the CAR argument, when prior acquisitions are highly similar, acquirers lack the generalist skills to appreciate a range of acquiring opportunities (Levinthal and March, 1993). When prior acquisitions are highly dissimilar, acquirers lack the specialist skills to extract gains from any one type of acquisition.

There are a variety of reasons that firms may acquire another firm. An organization may use acquisitions as a mechanism to acquire new resources and capabilities in order to enter new markets (Amburgey and Miner, 1992); strengthen an existing market position (Baker and

Bresnehan, 1985); elaborate positions in existing markets (Ahuja and Katila, 2001); or, leverage capabilities (Hamel and Prahalad, 1993). Market-strengthening acquisitions are particularly common and path dependent because they exploit existing market positions and capabilities (Levinthal and March, 1993). A series of highly similar acquisitions reflects a singular logic to, say, eliminate competitors (Anand and Singh, 1997; Baker and Bresnehan, 1985; Barton and Sherman, 1984), attain economies of scale and scope (Scherer and Ross, 1990) and develop technical knowledge (Ahuja and Katila, 2001). In turn, managers develop standardized and specialized routines so as to make those acquisitions once again (Szulanski, 1999). As this expertise evolves, gains from deployment become more accessible, transparent and immediate, prompting further, similar acquisitions; this supports the efficient market hypothesis. Yet because these acquirers fail to explore new markets and capabilities, they cannot attain new knowledge bases. Therefore, they are vulnerable to competitors whose acquisitions co-evolve with markets (Leonard-Barton, 1992; Penrose, 1959). When problems are open-ended (e.g., how to develop better returns from acquisitions), diverse experience helps lower the risk of making Type 1 (rejecting a hypothesis that is true) and Type 2 (accepting a hypothesis that is false) errors in tackling related or sub-problems.

Adaptive performance from problems is associated with variety in the way that individuals, groups or firms solve them (Ashby, 1956; McGrath, 2001). Research and development groups with diverse prior experience develop greater capacity to identify, assimilate and apply new research and development opportunities (Cohen and Levinthal, 1990). It follows that diverse acquisition experience might yield rich inferences about the causes of acquisition performance (Cheng and Van de Ven, 1996; McGrath, 2001). Performance differences between acquisitions in different markets help generate inferences about a) returns that are available in different

markets and b) whether the acquirer's capabilities can compete for those returns (Haleblian and Finkelstein, 1999). Different acquisitions also help firms to evaluate whether and how implementation routines are suited to their acquisitions. To illustrate, market-entering acquisitions require different integration skills than those that are needed to absorb another firm's manufacturing capacity (Haspeslagh and Jemison, 1991). By virtue of this variety, firms become better equipped to identify and respond to growth opportunities (Weick, 1979). Yet, a sequence of diverse market-entering acquisitions is also problematic. Research often shows that acquirers experience adverse performance from such acquisitions (Lang and Stulz, 1994; Levy & Sarnat, 1970; Porter, 1987). Persistent entry into new markets slows specialized learning about advantage that resides in specific markets. Disparate market positions and capabilities confound firms' abilities to exploit market power, niche market positions, economies of scale, and so on (Baker and Bresnehan, 1985). What can emerge is a loosely coupled, relatively incoherent federation of businesses with different attributes and administrative demands (Baker, 1992; Teece *et al*., 1994). Here, the bureaucratic costs (e.g., information-processing demands) of managing disparate businesses can overcome possible efficiencies from internalizing transactions (Hill and Hoskisson, 1987).

The foregoing suggests that acquiring is a balancing act between exploiting existing opportunities and exploring for new ones. Acquiring a series of highly similar businesses promotes specialized learning about that business, but prevents learning about other businesses. If these acquirers make another similar acquisition, they become even more specialized. Yet, these firms lack the skills to effectively select and implement non-conforming acquisitions. Acquiring a series of highly dissimilar businesses helps firms to discover new bases of knowledge and experience, but prevents specialized learning about any one business. If these

firms make another diverse acquisition, they become even more administratively stretched and incoherent (Teece *et al*., 1994). Yet, these firms lack the skills to effectively select and implement acquisitions that exploit an existing market position.

Therefore, both types of acquisition experience are detrimental to selecting a focal acquisition *irrespective* of the nature of that acquisition. It follows that firms with experience in acquiring businesses that are not too similar or different to one another are best placed to select a focal acquisition. Put another way, this experience enables firms to gauge what is special, unique and important about that opportunity. Thus, an inverted U-shaped relationship will govern the relationship between a) the similarity between the businesses of prior acquisitions and b) focal acquisition performance. This is restated below:

> *$H2_{CAR}$: There will be an inverted U-shaped relationship between the similarity of antecedent businesses and focal acquisition performance.*
>
> *$H2_{q}$: There will be positive relationship between the similarity of antecedent businesses and focal acquisition performance.*

One reflects the short-run investor expectations of business organization while the other reflects the long-term need for continued improvements to efficiency. As discussed, the performance as well as the nature of prior acquisitions predicts firms' abilities to generate adaptive inferences from their acquisitions (Cyert and March, 1963; Levinthal and March, 1993). The following section presents the impact that adaptive performance has on focal acquisition activities.

2.3.3. Learning from Prior Performance

Prior literature suggests that organizations tend not to search deeply for inferences from prior acquisitions that they perceive to be successful or large failures. This rests on the belief that successful acquisitions promote 'satisficing' that limits the desire to search for new and superior

solutions (Cyert & March, 1963). Likewise, large failures limit organization search since it questions competence that may induce market decline. Further, failed acquisitions lead to 'attributional errors' in which managers attribute performance to factors outside their control, including industry conditions or surprises about the target firm (Kelley, 1971). Unlike the problems associated with gains or large losses, small losses highlight problems without suggestion of incompetence. Therefore, firms are less likely to learn from acquisitions that result in gains or large losses. Based on the above argument, small losses should contribute to organizational learning and superior performance on the next acquisition. Moreover, the greater firms' experience with these small losses, the greater the scope for this learning.

> *$H3_{CAR\&\ q}$: The greater the number of small losses incurred in antecedent acquisitions, the greater the focal acquisition performance.*

The foregoing argues that the nature and performance of prior experience predicts the types of inferences that firms will glean from them. Yet, unless inferences are generated and applied in a timely fashion they assume limited value (Huber, 1991). Thus, the following section addresses the temporal intervals between acquisitions. Although it is not tested here, it is further expected that when firms are below unity for *Q*, the rate of small loses will impact the performance and even timing between acquisitions.

2.3.4. Timing of Acquisitions

Acquisition and installation of capital goods costs more the faster the capital stock is expanded and therefore *Q* may always be at unity; however, it takes variation in the speed of investment to keep it so (Tobin, 1976). Research shows that a very long or very short interval between two projects hampers project development (Brown and Eisenhardt, 1997; Gersick, 1994). On the one hand, very long intervals increase the likelihood that the inferences from the prior experiences

are unavailable, inaccessible and inapplicable (Argote *et al*., 1990; Ginsberg and Baum, 1998). Managers are more reluctant to codify learning and otherwise generate inferences from activities that they do not expect to repeat (Winter and Szulanski, 1998). Further, learning resides in routines as well as the people who know how to operate those routines (Levitt and March, 1988). These people may be unable to apply learning to a focal acquisition because they have, say, left the firm or moved to another division. Unless the learning is well codified, it may not be compelling, relevant, and salient to managers who worked on the focal acquisition but not the prior one. On the other hand, firms may be unable to generate meaningful inferences from very recent acquisitions. Acquisition fieldwork and laboratory experiments show that managers cannot carefully evaluate acquisitions that occur in quick succession (Haunschild, Davis-Blake and Fichman, 1994). Managers often experience an adrenaline rush or over-exuberance to acquire (Jemison and Sitkin, 1986). Preoccupied with doing the next deal, these managers ignore inferences from prior acquisitions, particularly if those inferences raise doubts about the merits of the focal acquisition (Haunschild *et al*., 1994). Thus, inferences fail to take root from acquisitions that very quickly follow one another.

All this suggests that the process of generating inferences can be derailed when there are very long and very short intervals between acquisitions. In turn, this will reduce focal acquisition performance as restated below:

> *$H4A_{CAR\ \&\ q}$: There will be a curvilinear relationship between time between the previous acquisition and the focal acquisition and acquisition performance.*
>
> *$H4B_{CAR\ \&\ q}$: There will be a curvilinear relationship between average time between acquisitions and acquisition performance.*

The foregoing elaborated theory on when firms learn from their acquisitions experience. In particular, the previous study hypothesized that firms will learn from acquiring businesses that

are neither too similar nor dissimilar to prior ones. Further, small losses from acquisition experience will promote search for rich inferences from acquisition experience. Finally, inferences are generated and applied more effectively when there is neither too little nor too much time between acquisitions. In turn, it is expected that this learning will be adaptive and so positively relate to focal acquisition performance. The current sample and methods are outlined that replicated the hypotheses of previous research.

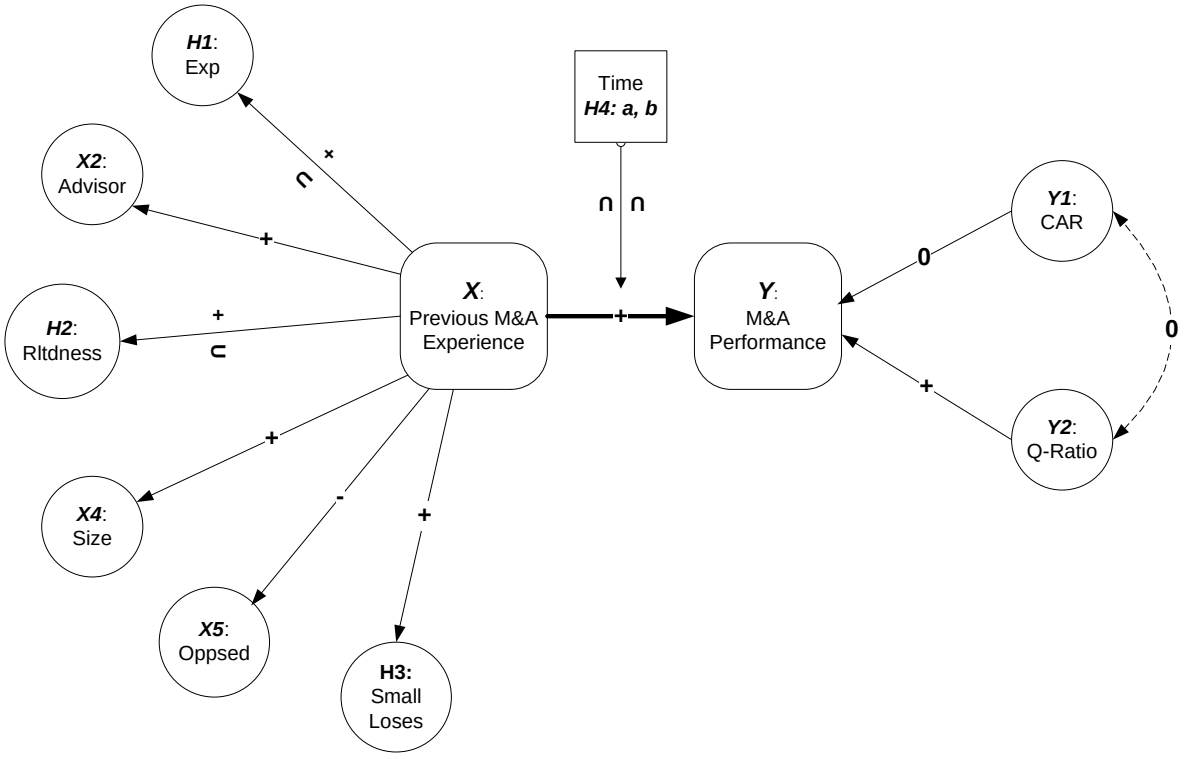


Figure 1: Proposed Theoretical Model

Figure 1 is a summary of the proposed theoretical model with expected directionality of findings. Where more than one symbol is presented on the line, the symbol on the right represents the expected findings for *Q* while the symbol to the left of the line is the expected findings for CAR.

Table 1: Summary of Previous Research on Negative Transfer Effects with Respect to Acquisitions.

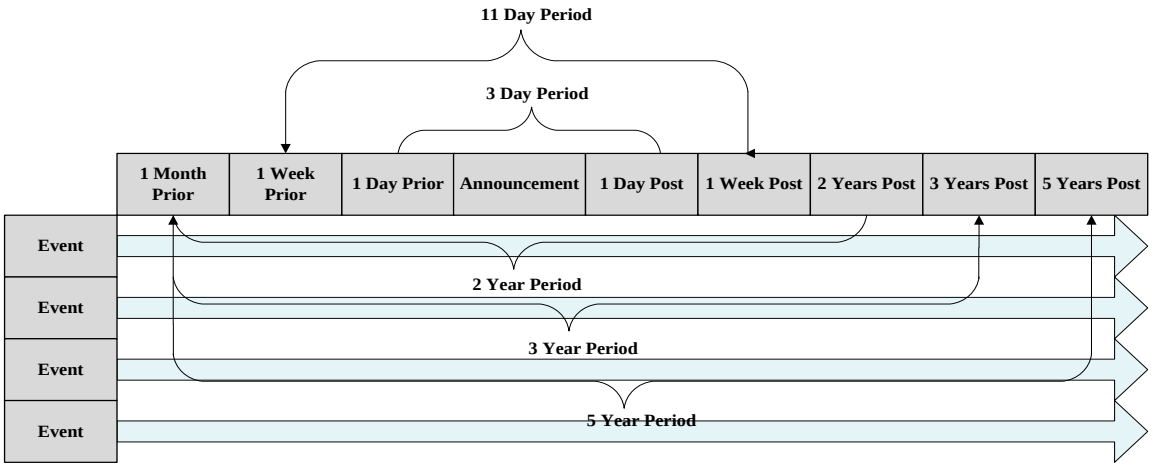
Authors	Hypotheses & Findings	Data Set	D.V.	I.V.	Controls
Haleblian & Finkelstein (1999)	1a) Antecedent exp positively related to performance (not supported)	449 'large' acquisitions between 1980 and 1992	Acquisition Performance	Experience	Acquirer-to-Target relatedness
	1b) Antecedent exp not related to performance (not supported)			Target-to-Target Similarity	Relative acquisition size
	1c) Antecedent exp negatively related to performance (supported)				Stock consideration
	2) U-Shaped relationship between Antecedent exp and performance (supported)				Acquirer slack
	3) Positive relationship between similarity and performance (supported)				Attitude Acquiring firm performance
					Period Effects
Finkelstein and Haleblian (2002)	1) Performance positively associated with similarity (supported)	192 'large' completed acquisitions by 96 acquirer between 1970 and 1990	Acquisition performance	Acquirer-to-Target similarity	Relative acquisition size
	2) Performance greater for antecedent than second acquisition (supported)			Second acquisitions	Stock consideration
	3a) When second acquisition is similar to antecedent, performance is greater in second (not supported)			Relative acquisition size	Acquirer slack
	3b) When second acquisition is dissimilar to antecedent acquisition, first outperforms second (supported)			Stock	Attitude
				Slack	Acquiring firm performance
				Attitude	Year
				Acquiring firm performance	

Hayward (2002)	1) Inverted U-shaped relationships between performance and similarity of antecedent experience (supported) 2) Positive relationship between number of antecedent small loses and focal performance (supported) 3a) Inverted U-shaped relationship between antecedent acquisitions and focal performance (supported) 3b) Inverted U-shaped relationship between time elapsed between acquisitions and performance (supported)	350 focal acquisitions made by 100 'large' acquirers between 1990 and 1995	Acquisition performance	Acquisition experience Similarity of antecedent acquisitions Small acquisition loses Timing of antecedent acquisitions Timing of focal acquisitions	Year Industry Firm size Firm performance Business similarity Relative acquisition size Contested bid Foreign bid Method of payment Use of advisor

3. METHODS

The unit of analysis for this study is the transaction since the hypothesis is that at the transaction level, firms that have engaged in previous acquisitions will outperform firms that have not and that there is an optimal level of timing and amount. Given the preceding, it is necessary that at each transaction, the requirements are met. This section is divided into three parts. The first part is the data collection and summary information of the sample set which includes a discussion of the variables collected. The following section is a discussion of the cumulative abnormal returns measure. Finally Tobin's *Q* measure is discussed.

Table 2: Representation of Sample Collection



Transfer theory research in the psychology literature typically consists of a two-stage experiment comprising a training phase (the learning period) and a testing phase (the focal acquisition period) with the latter used to determine how the training period influenced performance in the testing stage (Ellis, 1978; Finkelstein and Haleblian, 2002). **Error! Reference source not ound.** is a graphic representation of the sample collection method. Each event represents one line

(unit of analysis) in the data set. One firm may have several events in the data set that are collected over a five year period. The announcement date serves as the referent point for each event. Appendix B, tables 15 and 16 provide the matrix of firms' movement through the 15-year study period. The first column is the number of times that a firm has executed a merger or acquisition. Therefore, in year 1996, there are 46 firms who enter the study for the first time; they had their first 'experience'. What is interesting to note is that all firms started the study with a base set of experiences of "0." We would expect to see only 46 firms execute their first merger or acquisition at that time with no firms experiencing more than 1. However, as illustrated in Appendix B**Error! Reference source not found.**, there are 14 instances of 2 acquisition experiences and even 1 instance of 5 acquisition experiences in the same year; one firm executed 5 acquisitions in 1996.

The far right column in Appendix B illustrates the number of times the corresponding 'experience' took place from the far left column. **Error! Reference source not found.** is a graphic representation of the matrix that illustrates the movement of acquisition experience through the sample period. The general trend reflects the M&A wave illustrated by both McNamara et al. (2008) and Jovanovic and Rousseau (2002). Acquisition activity during this period rose to a high of 385 'events' in 1998 and quickly dropped off to only 37 events in 2005, a mere 6% of the high.

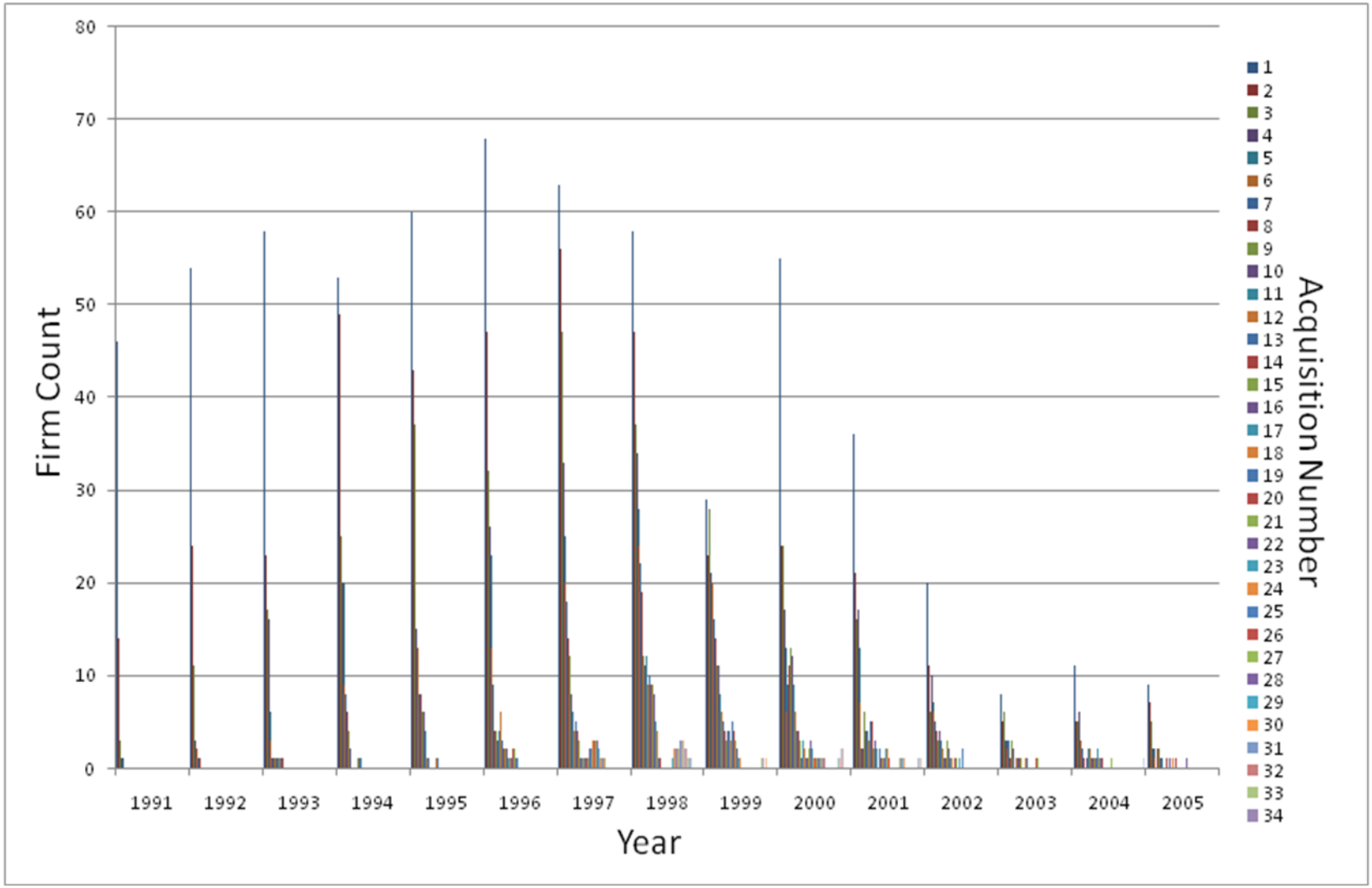


Figure 2: Experience Movement through Study

3.1. SAMPLE

The total sample contains all publicly disclosed acquisitions for the fifteen year period from 1991 to 2006 for U.S. domiciled firms. Although previous samples consisted of only the 100 largest U.S. domiciled firms by market capitalization as reported by the *Fortune* magazine from six industries[8], this sample contains all firms regardless of size or SICs. It was decided to extend the sample in order to further test whether the findings are generalizable across industries and firm size. The full sample set contains 2,190 firms that undertook 8,898 acquisitions. For this study, a random sample of 665 firms that completed 2,699 acquisitions were selected which represents 30.33 percent of the total amount of events in the database[9]. The focal deals include only domestic acquisitions of minority interests, material assets, and wholly acquired deals. The sample includes a natural morbidity rate that is accounted for by either firms not having enough time since the last announcement and their last return to complete the full five year measurement period, or the firms themselves were acquired after their last announcement. The result is that of the 2,699 firms included in the sample, 2,625 had enough information available to calculate their *q* at announcement; 2,511 had information available at the two-year measurement; 2,371 for three-year; and, 2162. Eighty percent of the study sample 'survived' to the full five year period. It is expected that the remaining sample will demonstrate similar morbidity rates.

[8] The six industries in the Hayward sample consists of: drug and medical supplies, food processing, forest products and packaging, oil and gas refining and production, regional banking, and telecommunications services. Hayward makes no distinction for how the sample of the six industries was defined.

[9] Note that the remaining 70 percent of the database are holdouts for future testing and theory validation.

In a previous study (Hayward, 2002), a ten-year sample was divided into a five-year learning period and a five-year focal period with only the focal period used as the measurement period. However, other studies have excluded the five-year learning period and used their full data set as the measurement period (Finkelstein and Haleblian, 2002; Haleblian and Finkelstein, 1999;). A decision was made to omit the learning period and use the full fifteen year time as the measurement period which ensures that all firms start at the same base-line of "0" learning[10]. The full fifteen year period ensures that a large enough sample can be obtained to measure *q* for a five year period after the acquisition event.

The primary source of acquisition data came from the Securities Data Company (SDC) Platinum database provided by Thomson Financial. The SDC Platinum database is frequently used in acquisition research and provides comprehensive information on acquisitions (Finkelstein and Haleblian, 2002; Hayward, 2002; Deutsch, Keilm and Laamanen, 2007). The Center for Research in Securities Prices (CRSP) was used to obtain information on liquidating value of a firm's preferred stock. COMPUSTAT was used to obtain information on the outstanding shares of the firm, prices over the one-year window provided in SDC, and total assets of the firm.

In Appendix A, summary information of the sample set for the study is provided. Of particular note is that out of this random sample from the total population SIC 60, Depository Institutions, and SIC 67, Holding and Other Investment Offices, account for a large number of the total events. This may be due to period effects that represent consolidation in those industries around

[10] I recognize that not all firms have "0" M&A experience before the first one in the dataset. However, since I am interested in a time series that evaluates the relationship between a series of events, assuming a baseline of zero provides a grounding point for the series. As will be illustrated later, since the series is a count of proceeding events, any other assumption would have be as appropriate since the absolute number of events is what would be considered.

the time period under consideration. Tests for both industry and time effects were conducted to determine the impact on the overall study. No period or time tests were found significant; therefore, we can assume that the sample is a good representation of the total population.

3.2. DEPENDENT VARIABLES

Two measures of the dependent variable, acquisition performance, were measured. CAR is the level of wealth that acquirers generate from their focal acquisition. The methodology attempts to explain whether differences in the performance of acquisitions of the sample are explained by characteristics of antecedent acquisitions. A significant and positive relationship between prior experience and the performance of future acquisitions suggests that the firm has learned how to subsequently generate favorable acquisition performance whether it is through better investment and diversification decisions (Jose, Nichols, & Stevens, 1986; Malkiel, von Furstenberg, & Watson, 1979), the relationship between ownership equity and firm value (McConnell & Servaes, 1990; Morck, Shleifer, & Vishny, 1988), performance and tender offer gains (Lang, Stultz, & Walkling, 1989), or financing, dividend, and compensation policies (Smith & Watts, 1992).

As a traditional measure of firm performance and as the null hypothesis (there is no difference between previously used measures and *Q* measures), both a conventional event study methodology that measures CAR[11] (Schoenberg, 2006; Hayward, 2002; Haleblian & Finkelstein, 1999) at the announcement date and an MTS (ARIMA) with transfer functions were used. This measure gauges whether, a priori, investors believe that acquirers have selected the right

[11] I am grateful to Professor Hayward for his comments on how he conducted the event study to ensure that my study replicated his.

acquisition. The event study methodology assumes that markets are informationally efficient. The market efficiency assumption suggests that security prices reflect all publicly available information and that fluctuations in market price are indicative of new information which makes the CAR measure an appropriate proxy for acquisition performance. Haleblian and Finkelstein (1999) give the CAR measure as:

$$\varepsilon = R_{it} - R_{mt} \qquad (1) \text{ CAR}$$

where R_{it} is the return of the stock *i* on day *t* and R_{mt} is the return on the market portfolio on the same day. The DJIA is the measure for the market portfolio. Additionally, measures over both a three day period (the announcement day plus and minus one day) and an eleven day period (the announcement day plus and minus five business days; see **Error! Reference source not found.**) re used. The abnormal return measure appears to be a good measure of acquisition performance in the short-run since previous research suggests that it also predicts the ultimate performance (Healey, Krishna & Ruback, 1992) whereas the *Q*-ratio will indicate the actual result of the ultimate performance. The implication is that since the cumulative abnormal returns measures the performance of the acquisition announcement over a shorter period of time and since acquirers are not likely to announce other information at the same time as an acquisition, then there is less likelihood that outside information impacts the acquisition announcement (personal correspondence with Hayward; Haleblian and Finkelstein, 1999).

Approximate *q*-ratio (hear after *q*) prior to investment will be measured as follows[12]:

[12] Formula derived from Blose and Shieh (1997) and Chung and Pruitt (1994).

$$Approximate\ q^0 = \left(D_F^0 + E_F^0 + P_F^0\right) / A_R^0 \qquad (2)\ \mathbf{q}$$

Where D, E, and P represent the Debt claims, Common Equity, and Preferred Equity in the F – financial markets – respectively and A is the assets of the firm in the R (real asset market). This measure of *Q* is taken from Chung and Pruitt (1994) who found that this approximation of *Q* accounted for 96-percent of the variance of the Lindenberg and Ross (1981) measure of *Q*. Therefore, as a parsimonious measure of *Q*, *q* represents a sufficient measure that balances efficiency and efficacy. The estimation of *q* is decomposed as follows:

- D_F^0 is the value of the firm's short-term liabilities net of its short-term assets plus the book value of the firm's long-term debt;
- $\mathbf{E_F^0}$ is the number of common stock shares outstanding times the share price;
- $\mathbf{P_F^0}$ is the liquidating value of the outstanding preferred stock;
- finally, $\mathbf{A_R^0}$ is the book value of the firm's total assets.

The measure of performance then is the change in *q* between t^0 and t^1, t^2, t^3, t^5 as indicated in formula 2:

$$Performance\ q_i^t = \Delta q_{it_{2-1}} \qquad \text{(3) Performance}$$

Where CAR represents investor expectations of future performance by the firm, *Q* represents the actual ability of managers to competitively use their resources and capabilities. Over time, *Q* captures a firm's efforts to manage debt through payoffs and loans and preferred and common stock through issuances and buybacks. CAR, on the other hand, only captures the current price of

the stock on the market. In this regards, *Q* captures the strategy of the firm to gain and maintain competitive advantages.

3.3. INDEPENDENT VARIABLES

Acquisition experience: Firm acquisition experience is the sum of recent acquisitions undertaken by the firm, from 1991 to the focal deal. All firms were assumed to have made their first acquisition during the focal period (1991 – 2005) and received an initial experience score of 0. Controlling for firm experience is important since the results of the similarity measures are determined according to the number of preceding acquisitions.

Similarity of Prior Acquisitions: The measure is a simple percentage score that calculates the percentage of prior acquisitions that conform to the most common 4 digit SIC code. Thus, if all prior acquisitions are within the same SIC code, the score is 1. If no two acquisitions share the same SIC code, the score is 0. If two out of the firm's four acquisitions share the same code, the score is 0.5 and so on. The scores are multiplied by a factor of 10 so that there squared terms represent higher scores when the model is an inverted curvilinear relationship.

Small acquisition losses: The number of times a firm recorded an announcement loss of less than 3% as measured by the cumulative abnormal return methodology used above. 3% is an arbitrary rate of small losses but was used in the Hayward (2002) study where he found that 1 and 2% yielded similar results. Similar models for *q* were tested.

Timing of prior acquisitions: The mean number of days between prior acquisitions, excluding the focal acquisition. If the firm has only one prior acquisition, the maximum interval is imputed. This is the date of the acquisition less the date when the first acquisition was recorded (i.e.,

January 1, 1991). To model the curvilinear relationship tested, the squared term of this variable is also included.

Timing of focal acquisition: The number of days between the focal acquisition and the one before it. When the focal acquisition is the firm's only one, the same imputing procedure as above is used. Again, the same inverted U-shaped relationship is hypothesized.

Discount factors: The choice of discount rate to apply to the value of prior experience is somewhat arbitrary (Hayward, 2002; Ingram & Baum, 1997; Argote *et al*., 1990). The baseline assumption is no discounting, the approach adopted by Hayward (2002), and Haleblian and Finkelstein (1999). Other variables are subjected to other discount rate assumptions, including 1 divided by the years elapsed from the prior experience.

Use of advisor: A simple percentage score that calculates the percentage of prior acquisitions that use and advisor. Thus, if all prior acquisitions are use and advisor, the score is 1; if no acquisitions use one, the score is 0. The scores are multiplied by a factor of 10 so that there squared terms represent higher scores when the inverted curvilinear relationship is modeled.

3.4. TRANSACTION LEVEL VARIABLES

Contested bid: A dummy variable where 1 denotes a contested bid (i.e., the acquirer engages in a contest with another suitor for the target) and 0 is otherwise. This factor is often found to reduce acquirer returns because the price of the target is bid up in these situations (e.g., Hayward & Hambrick, 1997). Lang et al (1989) found that opposed offers are more likely in disciplinary takeovers and constitute a subset of acquisitions in which managerial performance may play a more important role.

Foreign bid: A dummy variable where 1 is the acquisition of a non-U.S. operation and 0 is the acquisition of a U.S. operation. Foreign acquisitions may generate lower returns to the extent that the acquirer is less familiar with such targets.

Method of payment: A dummy variable where 1 is a cash offer and 0 denotes stock payments or a combination of cash and stock. Research suggests that stock financed acquisitions generated significantly lower returns than cash financed ones (e.g., Loughran and Vijh, 1997).

3.5. CONTROL VARIABLES

Previous researchers have identified numerous factors that explain acquisition performance including the firm's industry, its financial condition and the nature of the acquisition undertaken (Loughran & Vijh, 1997; Agrawal *et al*., 1992).

3.6. INDUSTRY AND TEMPORAL LEVEL VARIABLES

Year of acquisition: Series of dummy variables for the years 1991 to 2005 where 1991 serves as the residual category. Both the year and industry dummies will be included in all the estimation equations. This is consistent with prior studies to account for period effects (Hayward, 2002; Haleblian & Finkelstein, 1999; Haunschild, 1993).

Industry: Codes for the 2-digit SIC identifier are used as dummy variable in order to remove firm level effects. This study consisted of 54 2-digit SIC where the 10 served as the residual.

3.7. FIRM LEVEL VARIABLES

Firm size: Firms were standardized (*Z*-scores) from their sales preceding the acquisition announcement.

Firm performance: The total shareholder returns of the acquiring firm in the year prior to the acquisition. This variable controls for overall firm performance as opposed to a firm's acquisition performance calculated as follows:

$$TSR = {(P_i - P_0 + D)}/{P_0} \qquad \textit{(4) Total Shareholder Returns}$$

Business similarity: Controls for the similarity of the focal acquisition to the firms' existing line of business using the same scale as discussed above for the similarity of prior acquisitions (Rumelt, 1986).

Relative acquisition size: The final purchase price of the acquisition as a percentage of the market capitalization of the acquirer at the time of acquisition announcement. With their larger impact, larger acquisitions are more able to affect acquisition returns.

3.8. MODEL DEVELOPMENT

Regression and other econometric procedures have historically been utilized to specify and estimate the relationships between sets of time series such as CAR and M&A as well as to predict future results of a times series of interest (shareholder wealth). Great effort and attention must be taken in the specification of the model form when these procedures are used since the parameter estimates derived from the model are contingent on the form. Model specification requires a firm a priori understanding of the underlying processes generating the time-series data and the model specification frequently leads to controversy. With respect to M&A, the hypothesized relationship often conflicts even when researchers are looking at similar relationships (Hayward, 2003; Finkelstein and Hablian, 2002) due to the presence of seemingly complex error structures and delayed effects of learning.

Under the conditions outlined in previous research efforts and upon which this study is modeled, the investigator was concerned with understanding why some firms outperform others in M&A activity and hypothesized that the occurrence was due to learning from previous acquisition experience. The strategy that is taken is to record the number of acquisitions that have taken place until the focal acquisition (Haleblian and Finkelstein, 1999; Hayward, 2002; Porini, 2004). Presumably, those firms with more prior acquisitions would outperform firms with fewer. One indicator of learning is the amount of time between previous and focal events. In this example, the dependent variable is an indicator of time elapsed between events: t_i. In addition to collecting data about the duration of time, exogenous variables theorized to influence t_i may be collected. To test the hypothesis, the impact of the exogenous variables on *t* could be estimated from the regression:

$$t = \beta' X + \varepsilon \qquad (5)$$

where the $\beta' X$ is a matrix of exogenous variables and associated parameters and ε is a random error disturbance (Box-Steffensmeier and Jones, 1997). Although this method is conceivable, Box-Steffensmeier and Jones (1997) found that there are two problems associated with this method: right-censoring and time-varying covariates.

Traditional methods of analysis of these data series have utilized an OLS model of the form:

$$y_t = \alpha + \beta x_t + e_t \qquad \textit{(6) OLS Regression Equation}$$

where α and β are regression coefficients, and e is a stochastic disturbance. Included in this study are the traditional OLS models in order to evaluate the findings from this model with respect to the findings of the ARIMA model. However, it is recognized that significance tests of OLS regression estimates assume non-autocorrelation of the error terms; i.e. at sequential points

in the series, they should be randomly distributed. Additionally, it is assumed that the mean of the error terms should be zero and the variance constant throughout the time series. When the value in the datum in time t_1 is dependent upon the value of the datum in time *t*, as is the case with *q* and CAR, a dependency exists that links the error terms and the non-autocorrelation assumption is violate. The effect is that the OLS estimates appear far better than they actually are leading to the assumption that significant relationships exist where they may not. The Durbin-Watson test is the standard test for autocorrelation. However, Dezhbakhsh (1990) found that the Durbin-Watson test is often performs poorly in models with more than one lag of the dependent variable.

Under the preceding situation, an ideal methodology appears to be the transfer function model of Box and Jenkins (1976) (Adams and Moriarty, 1981) applied to a time series analysis. Time series analysis is a chronological sequence of observations corresponding to the variable under study and is based on the assumption that past behavior can be used to predict future behavior (Saaty and Vargas, 1990). In economic time series analysis, the researcher often works with models where it is necessary to include lagged values of the independent variables to make the model realistic (Edlund, 1984). If, as in this study, the researcher wants to investigate the relationship between prior and focal acquisitions, it is reasonable to assume that the focal activity will be affected not only by the current actions but also by the learning that took place in previous events; this kind of relationship can be included in the transfer function models described by Box and Jenkins [B-J] (1976). The advantage of the transfer function modeling is that it offers a systematic technique and empirically based set of steps that eliminate from the consideration a large number of potential model specifications; regression and econometric models cannot make the same claim.

Suppose that a researcher has access to a dependent (the firm's Q-ratio) time series, Y_t, and another (M&A announcements) time series, X_t, measured contemporaneously with Z_t. It is reasonable to suspect that the two series are functionally related, a general form of a distributed lag relationship could be written using the following notation:

$$Z_t = \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \cdots + \beta_l X_{t-l} + \epsilon_t \qquad (7)$$

where Z_t is described by a weighted sum of the current and lagged values of X. The values appear at time lags 0, 1, 2,…, l, with weights β_0, β_1, …, β_l. ϵ_t is random error, usually assumed independent and normally distributed, with mean zero and constant variance. A distributed lag model takes for granted that a stimulus (M&A) evokes a full effect only after the passage of time and that the full effect is not felt in the same period in which the stimulus occurs. Since there are lags between learning and subsequent M&A performance, it is intuitively appealing to measure acquisition experience effects in this manner.

Specifications of a unique form of equation (7) for a given setting are conditioned upon the researcher's orientation. Typically, researchers who follow a regression or an econometric epistemology specify alternative model forms, usually by specifying restrictions on the β's. These alternative model forms are then tested empirically against appropriate data and the model. In the estimation process, serially correlated errors are often detected. While methods exist for dealing with autocorrelation, one is often uncertain whether the observed autocorrelation is confounded with the structural part of the model. Furthermore, procedures that may "solve" the autocorrelation problem (such as using the first differences of the variables in a regression model) may also tend to reduce the ability of the data to provide the researchers with meaningful information about the nature of the relationships of interest.

An alternative approach to identification of equation (7) is to begin with the premise that the autocorrelation structure of a time series represents an intrarelationship within the series. The important task in identification of time-series relationships is to remove the intrarelationship (serial correlation) within the series prior to determining their interrelationships. This is the transfer-function methodology insofar as identification of the relationships is concerned (Adams and Moriarty, 1981; Pack, 1977).

3.8.1. ARIMA and Transfer Function Models

An autoregressive, moving average (ARIMA) model has the form (Saaty and Vargas, 1990):

$$X_t = \delta_1 X_{t-1} + \delta_2 X_{t-2} + \cdots + \delta_p X_{t-p} + e_t - \theta_1 e_{t-1} - \theta_2 e_{t-2} - \cdots - \theta_q e_{t-q}. \quad (8)$$

The order of an ARIMA model is usually denoted by the notation ARIMA (*p*,*d*,*q*) where *p* is the order of the autoregressive part; *d* is the order of the differencing; and, *q* is the order of the moving average process.

The use of univariate models for description and prediction of economic time series has been criticized by econometricians because the autoregressive moving average (ARMA) models could be used without understanding the underlying economic system and because ARMA models could not be used to predict future values of a series when the system has been 'shocked' (Edlund, 1984). As mentioned above, the B-J TF may be used to overcome the objection presented by the economists. The TF model resembles ordinary regression models but has the advantage of an explicit noise model which allows the residuals to be autocorrelated. The basic TF model with on independent variable, X_t, may be split into two components following Jenkins (1979):

$$y_t = u_t + \Delta Z_t \quad (9)$$

where, y_t is the dependent variable (suitably differenced / transformed to be mean and variance stationary), u_t contains that part of y_t which can be explained exactly in terms of x_t (suitably differenced / transformed to be mean and variance stationary) and ΔZ_t is an error term which represents all the 'missing' *x* variables plus the pure noise.

The relationship between x_t and u_t can be expressed by a linear dynamic relationship of the kind:

$$u_t - \delta_1 u_{t-1} - \cdots - \delta_r u_{t-r} = \omega_0 x_{t-b} - \omega_1 x_{t-b-1} - \cdots - \omega_s x_{t-b-s} \qquad (10)$$

solving for u_t:

$$u_t = \frac{\omega_0 - \omega_1 B - \cdots \omega_s B^s}{1 - \delta_1 B - \cdots - \delta_r B^r} X_{t-b} = \frac{\omega(B)}{\delta(B)} X_{t-b} = v(B) X_t \qquad (11)$$

where

$$v(B) = \frac{\omega(B)}{\delta(B)} B^b \qquad (12)$$

B is the ordinary lag operator, $\omega(B)$ is a 'moving average' operator, $\delta(B)$ is an 'autoregressive' operator, and *b* is a pure delay parameter that represents the number of complete time intervals before change in x_t begins to have an effect on y_t.

The transfer function $v(B)$ is a rational lag structure that may represent any form of dynamic relationship between x_t and y_t to any specified degree of accuracy (Edlund, 1984). In general, one might use differently differenced input and output variables. ΔZ_t may be replaced by the ARMA (p,q) model of the form:

$$\Delta Z_t = \mu + \frac{\theta(B)}{\phi(B)} a_t \qquad (13)$$

where $\phi(B)$ is an autoregressive operator (AR), $\theta(B)$ is a moving average operator (MA) and a_t represents the white noise series. If ΔZ_t is removed between (12) and (13), the TF-noise model is derived:

$$y_t = \mu + \frac{\omega(B)}{\delta(B)} x_{t-b} + \frac{\theta(B)}{\phi(B)} a_t \qquad \textit{(14)}$$

Where there is more than one independent variable, m variables $x_{2t},\ldots,x_{mt}$, (14) is easily generalized to:

$$y_t = \mu + \sum_{j=1}^{m} \frac{\omega(B)}{\delta(B)} x_{j,t-b_j} + \frac{\theta(B)}{\phi(B)} a_t \qquad \textit{(15)}$$

Additionally, it is possible to add a seasonal component to the series. It is also clear that ordinary regression models are a special case of the more general (15).

4. RESULTS

Figure 3 illustrates the average *q* over the five year period from one month before the announcement of the event to 5-years. A simple regression model with a polynomial trend line with fifth order appears to fit the data well. The average *q* of all firms and activities is plotted as the center polynomial trend line and is represented by diamonds. What is interesting to note about this is that although there are some differences between industries as to the overall measure

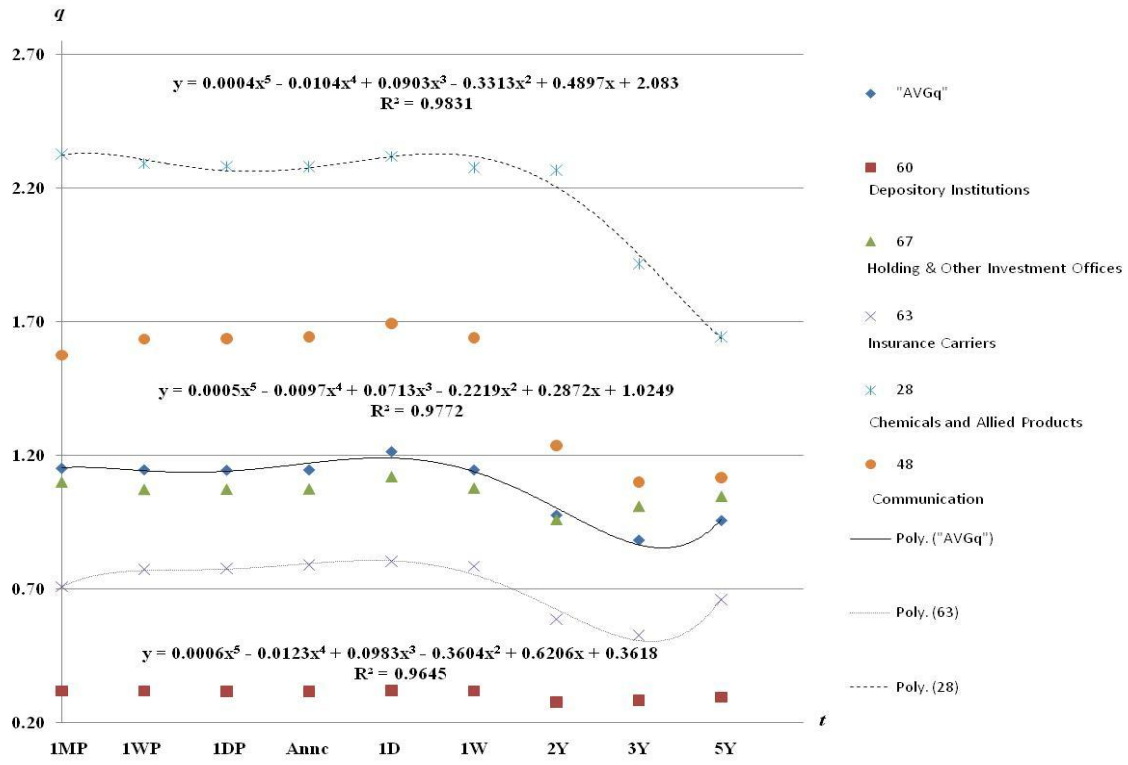


***Figure 3: Sample Simple Regressions of* q**

of *q*, the overall trend line appears to demonstrate similar qualities. Intuitively, this makes sense. One month prior to the acquisition announcement, the firm has a slightly lower *q*-ratio that rises slightly around the announcement period. One might account for this trend due to several factors. The first is that the stock price might see an initial rise in value. Second, the organization's debt structure (in the numerator of the *q* calculation) changes; i.e. it increases in order to fund the activity. The effect is that the inputs to the numerator in the calculation increase at a faster rate around the announcement than the increase in total assets. This supports, at least anecdotally, a claim that the acquirer does gain profits around the announcement period for at least a few days after the announcement. However, within a week of the announcement to merge, the line regresses to the mean.

Furthermore, the trend line supports claims that it takes longer than the short-term time that CAR examines in order to determine the success of an acquisition, at least from the perspective of the acquirer. On average, it does not appear that a firm begins to realize gains from the acquisition until sometime after 3 years at which point the *q* begins to trend up. With respect to SIC 28, the trend up has not yet begun, which supports some claims that M&A may take even longer than five years.

In this section, findings from both the OLS and ARIMA models are presented; section 4.1, presents the OLS results for both CAR and *q*; section 4.2 presents the ARIMA results for both dependent measures; finally, in 4.3, a comparison of the two models is discussed.

4.1. ORDINARY LEAST SQUARES (OLS)

4.1.1. CAR

Table 3 presents the descriptive statics and correlations for the variables used in the study with respect to CAR as the dependent variable. Note that the results for CAR at both the 3 and 11-day periods were similar. Therefore, only the 11-day period is presented here.

Table 3: *Means, Standard Deviation, and Correlations* CAR 1-week

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 CAR 11-days	0.00	0.08	1.000													
2 Firm size (Z)	2.92	0.93	-0.002	1.000												
3 Firm performance	4.06	10.97	-0.001	0.453**	1.000											
4 Contested bid	0.02	0.14	0.011	0.018	-0.006	1.000										
5 Foreign bid	0.15	0.36	0.033*	0.280**	0.115**	0.019	1.000									
6 Business similarity	0.24	0.89	0.035*	-0.075**	-0.020	-0.009	-0.005	1.00								
7 Relative deal size	14.06	207.59	0.013	0.053**	0.037*	0.098**	-0.018	-0.014	1.00							
8 Method of payment	0.23	0.42	0.030	0.071**	0.026	-0.017	0.085**	-0.018	-0.026	1.00						
9 Use of advisor	0.47	0.50	-0.067**	0.214**	0.069**	0.060**	-0.028	-0.059**	0.048**	-0.030	1.00					
10 Acquisition experience	4.79	6.78	0.014	0.251**	0.253**	-0.026	0.013	0.124**	0.056**	-0.068**	0.136	1.00				
11 Similarity of antecedent acquisitions	20.35	33.41	0.018	-0.050**	-0.059**	0.013	0.011	0.268**	-0.018	0.004	0.010	-0.148**	1.00			
12 Small acquisition losses	1.51	2.10	-0.026	0.235**	0.219**	-0.022	-0.045*	0.017	0.046**	-0.046**	0.132**	0.788**	-0.159**	1.00		
13 Timing of antecedent acquisitions (log)	2.94	0.45	-0.012	-0.266**	-0.104**	-0.010	-0.069**	-0.030	-0.023	0.068**	-0.018	-0.468**	0.126**	-0.421**	1.00	
14 Timing of focal acquisitions	2.98	0.82	-0.016	-0.239**	-0.106**	-0.002	-0.045*	-0.004	-0.017	0.070	-0.008	-0.420**	0.140**	-0.365**	0.793*0*	1.000

* p < 0.05, ***p* < 0.01 **(*N* = 2622)**

This table has several points worth noting. First, the mean for business similarity is .24 which signifies that 24 percent of previous acquisitions share the same 4-digit SIC code as a current acquisition[13]. Second, the correlation between acquisition experience and acquisition performance is positive and significant which provides support for Hypothesis 1 but differs from Haleblian and Finkelstein (1999) who found a negative relationship and Hayward (2002) who found no relationship. Given the variation in findings between the three studies, this suggests that the methodology may not be appropriate and might warrant an alternative modeling. Likewise, it may be due to the dependent variable that was selected. Finally, similarity of antecedent acquisitions is negative and significant; again differing form Haleblian and Finkelstein (1999) and Hayward (2002) who both found positive relationship, but that may be accounted for by differences in samples.

Since the data is cross-sectional and in-line with previous research, ordinary least squares (OLS) regression analysis to test the hypotheses for both CAR and *q* is developed. Therefore, firms that made more than one acquisition between 1991 and 2005 will appear more than once in the sample. Although the previous studies did not compute the Durbin-Watson statistic for autocorrelation, and despite the concerns raised by Dezhabakhsh (1990), a test for the statistic was used. For this study the Durbin-Watson statistic was 1.846, which suggests that autocorrelation was not a problem and is consistent with previous findings (Haleblian and Finkelstein, 1999). Table 4, model 1 includes the control variable. For announcement returns, this model yielded an R-square of 0.004 (see Table 5) which suggests that little variance of the model is accounted for

[13] This number is 19 percent higher than what Haleblian and Finkelstein (1999) found but may be accounted for by both the larger sample size and the fact that my study is more inclusive of firms.

Table 4: Acquisition Experience Analysis

Dependent variable: CAR (11-days)	Model 1	Model 2	Model 3	Model 4
Constant				
	-0.132	-0.263	0.027	0.428
Firm size (z)	0.001**	0.001*	0.000**	-0.063**
	0.044	0.062	-0.016	-1.897
Firm performance	-0.005	-0.007	-0.009	0.022
	-0.237	-0.318	-0.375	0.877
Contested bid	0.014	0.014	0.014	0.015
	0.712	0.708	0.688	0.754
Foreign bid	0.029	0.029	0.024	0.027
	1.397	1.419	1.153	1.227
Business similarity	0.029	0.029	0.021	0.022
	1.443	1.444	0.981	1.030
Relative acquisition size	0.015	0.016	0.016	0.010
	0.779	0.799	0.820	0.511
Method of payment (cash=1)	0.029	0.029	0.030	0.026
	1.448	1.459	1.529	1.266
Use of advisor	-0.068***	-0.068***	-0.069***	-0.057**
	-3.348	-3.357	-3.371	-2.629
Acquisition experience	0.018*	0.037*	0.138**	0.177***
	0.452	0.746	2.235	2.683
Similarity of prior acquisitions	0.005**	-0.019*	-0.057*	-0.079*
	0.126	-0.357	-1.021	-1.351
Squared term of similarity of prior acquisitions		0.018*	0.025*	-0.040
		0.649	0.332	-0.515
Small acquisition losses			-0.094***	0.088**
			-2.826	1.045
Timing of prior acquisitions (natural log)			0.003**	0.009*
			0.089	0.367
Squared term of timing of prior acquisitions (natural log)				0.011**
				0.106
Timing of focal acquisition (natural log)			-0.013**	-0.100***
			-0.393	-2.835
Squared term of timing of focal acquisition (natural log)				0.054**
				0.608
n	2622	2622	2622	2622
R squared	0.004**	0.004	0.010	0.186****

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$, **** $F < 0.01$

*Standardized coefficients reported with standard errors under. Dummy variables for years not shown.

by the control variables. However, both use of advisor and firm size had significant effects on announcement returns. When the model includes the number, nature, time and performance of antecedent acquisition activities, the R-square only increased to 0.186 (see model 4 of Table 5). The additional contribution to R square was 0.0, 0.01, and 0.176 for the similarity and size of previously acquired businesses, small acquisition losses, and timing of acquisitions respectively. Model 5 examines the effects of the experience variables when experience is discounted that did not account for additional variance in acquisition performance for either measures of performance and therefore is omitted from the report. For the relationship between experience and acquisition performance, hypothesis 1 predicted a curvilinear relationship. Like Hayward (2002), a squared term of the acquisition experience variable is included to test H1 and test the nature of the relationship. Like Hayward (2002) but different form Haleblian and Finkelstein (1999), no evidence to support a U-shaped relationship was found. Therefore, no claim of support for H1 using CAR as the dependent variable and OLS as the methodology can be made.

Hypothesis 2 predicted an inverted U-shaped relationship between the similarity of antecedent and focal performance. The test for this involved the inclusion of both a main effect and a squared term for the variables. When CAR is the dependent variable, the main effect yielded a negative and significant coefficient ($p < 0.05$) and the squared term yielded a positive but insignificant coefficient. Hence, the results yield a pattern opposite of what was expected for the findings of H2 and dissimilar to Hayward's (2002) study that suggests an inverted U-shaped relationship. In fact, this study suggests a U-shaped relationship. However, since the squared term is insignificant, the results may point to a linear negative relationship which suggests that as firms diversify more, performance decreases. The negative, linear relationship supports the

business concentration hypothesis that argues that firms that stick to a single line of business outperform those that over diversify.

Using the definition of small acquisition losses as prior deals that resulted in recorded announcement depreciation of 3%, the sample, on average, had less than one instance. The presence of a small acquisition loss as an antecedent condition had a positive (0.088) and significant ($p < 0.05$ in model 4). This would suggest that the greater the number of small losses, the greater the focal performance would be. These results are previous to similar findings and supports H3.

With respect to the effects of timing on acquisition experience, H4a predicted an inverted U-shaped relationship between the time between antecedent activities and the focal acquisition's performance. To model H4A, the time of prior acquisitions variable, as well as its squared term, was included in the model. Support of the hypothesis will be support if the directionality of the sign from the term to the square changes. H4A was not supported by the data at the 0.1 significance level. The findings suggest that there is a positive relationship between timing or prior and focal acquisitions but only slightly. With respect to H4b, the findings produced by the sample data suggest a U-shaped relationship between the timing or the focal acquisition and the prior, which supports H4b, which differs from Hayward's (2002) study. Both the focal variable and the square term were significant ($p < 0.05$). Hayward (2002) found that when he portioned his sample into quartiles for relative size, the findings did not hold for large acquisitions which demonstrated a positive relationship between acquisition timing and performance.

4.1.2. Tobin's *q*-ratio

Table 6 presents the fractiles of the q variable as it relates to the pilot study and is presented in order to illustrate the variation in q over the measurement period. At the bottom of table 5, Smirlock et al.'s (1984) findings are presented as a comparison between the pilot study and previous results. Notice that there is some difference in overall findings between the two but that the pilot study is within expected range. Variation between these results and Smirlock et al (1984) may be accounted for by both the limited size of the current study and the time period

Table 5: Fractiles for* q-*ratio

			Fractiles of the Sample Distribution of the Statistic						
	Mean	SD	Min	0.1	0.25	0.5	0.75	0.9	Max
Announcement Date - 1 Month	1.15	2.57	0.00	0.18	0.30	0.79	1.30	2.03	71.53
Announcement Date - 1 Week	1.15	2.60	0.00	0.18	0.30	0.79	1.27	2.01	74.25
Announcement Date	1.14	2.62	0.00	0.18	0.30	0.79	1.29	2.01	76.95
Announcement Date + 1 Week	1.14	2.58	0.00	0.18	0.29	0.80	1.29	2.01	73.35
Announcement Date + 2 Years	0.98	2.77	0.00	0.19	0.29	0.70	1.13	1.72	117.98
Announcement Date + 3 Years	0.88	1.78	0.00	0.20	0.28	0.63	1.13	1.64	65.98
Announcement Date + 5 Years	0.96	3.30	0.00	0.21	0.29	0.63	1.16	1.69	143.11
Smirlock et al (1984)	2.30	1.62	0.82	1.14	1.30	1.69	2.79	4.43	11.17

within which the data was collected. Although the maximum score of 143.11 reported in

Table 5 may appear extreme, but it is not out of the range of possible results, although it does represent an extreme case. The maximum score was earned by a firm in the machine and equipment industry (SIC Code 35; see Appendix A). In particular, the firm designs 'smart' material handling systems, which require a knowledge-based production function and which one would expect to have higher *q*-ratios given the relatively lower amount of assets (denominator of the measure) and typically higher level of 'intangible' capabilities captured in the stock returns

and debt structure. Furthermore, although we would not expect to see negative *q*-ratios, it is not unheard of and represents a surplus of current assets relative to current and long-term debt[14]. In Appendix C, the industry adjusted *q*-ratios, ranked on average for the one month prior to announcement period. The total data set, as mentioned above, contained 2622 acquisition events in the 54 industries presented in Tables 17, 18, 19, and 20 of Appendix C. Of note is that 4 of the acquisition events in three industries did not have sufficient information to calculate their *q*-ration over the entire five year period and were therefore omitted from the *q* measure. Where available, the tables in Appendix C present a comparison to Lindenberg and Ross' (1981) study with their *q*-ration and ranks presented in the far right column. Although no analysis was conducted to compare the result between this pilot study and the Lindenberg and Ross (1981) study, the difference is presumably accounted for by sample differences. Comparisons between the findings here and Lindenberg and Ross' are presented to illustrate the similarity in findings (order of magnitude similarities) and a rough comparison of results.

Like the data for CAR, the data for *q* are cross-sectional. Therefore, OLS regression analysis to test the hypotheses for *q* was used with controls for year and industry. Again, the Durbin-Watson (D-W) test for autocorrelation was conducted. The lowest D-W was for the model containing Year 3 (1.94); the highest value was for year 5 (2.01). The D-W results suggest that autocorrelation was not a problem and is consistent with previous findings (Haleblian and Finkelstein, 1999). Table 10 illustrates that there is a strong and significant correlation between *q* at the 2, 3, and 5 year periods. Furthermore, the results of the various models were similar.

[14] A possible adjustment for this phenomenon is to take the absolute value of the debt which will adjust for the negative number and return a relative *q*-value equitable to the others. Although this was not conducted for the pilot study, it will be investigated in the full data set.

Presented are the findings for q at 11-days for comparison to CAR and at 3 years – the approximate point that average q turns up from losses as illustrated in Figure 3.

In Table 7 and Table 8 for q at 1 week and 3 years respectively, model 1 includes the control variables. For q, this model yielded an R-square of 0.008 (1 week) and 0.013 (3 years). When the model includes the number, nature, time, and performance of antecedent acquisition activities, the R-square increased to 0.196 (model 4, 1 week) and 0.069 (model 4, 3 years). The additional contribution to R square was 0.000, 0.002, and 0.03 (3-years); for 1 week, the change to each model was 0.000, 0.002, and 0.185 for the similarity and size of previously acquired businesses, small acquisition losses, and timing of acquisitions respectively. Around the announcement time, the overall model fit for q and CAR are similar while for 3-years the model fit reduces significantly, which suggests that merely regressing the independent variables on performance in the short-run is not sufficient to predict long-term performance of a firm from market reaction to M&A announcement.

For the relationship between experience and acquisition performance, $H1_q$ predicted a positive relationship between q and antecedent experience. Table 6 and Table 8 illustrate a negative, significant relationship between q and experience ($p < 0.05$) that rejects to $H1_q$. The results provided in modeling focal acquisition experience with respect to the 'learning by doing' theorem using OLS would reject previous assumptions that a firm is capable at getting better at M&A simply by conducting M&A activity.

$H2_q$ predicted a positive relationship between the similarity of antecedent and focal performance. The test for this involved the inclusion of both a main effect and a squared term for the variables. When q is the dependent variable, the main effect yielded a positive, non-significant coefficient

Table 6: Means, Standard Deviation, and Correlations q 1-week

Variables	**Mean**	**S.D.**	1	2	3	4	5	6	7	8	9	10	11	12	13	14
q 3-Years	1.14	2.58	1.000													
Firm size (Z)	2.92	0.93	0.001	1.000												
Firm performance	4.07	10.98	-0.002	0.453*	1.000											
Contested bid	0.02	0.14	0.003	0.018	-0.006	1.000										
Foreign bid	0.15	0.36	0.047**	0.280**	0.115**	0.019	1.000									
Business similarity	0.24	0.89	0.011	-0.075**	-0.020	-0.009	-0.005	1.000								
Relative deal size	14.06	207.63	0.009	0.053**	0.037*	0.098**	-0.018	-0.014	1.000							
Method of payment	0.23	0.42	0.024	0.071**	0.026	-0.017	0.085**	-0.018	-0.026	1.000						
Use of advisor	0.47	0.50	-0.060**	0.214**	0.069**	0.060**	-0.027	-0.059**	0.048**	-0.029	1.000					
Acq experience	4.79	6.78	-0.042*	0.251**	0.253**	-0.026	0.012	0.124**	0.056**	-0.068	0.137**	1.000				
Similarity of antecedent acq	2.55	3.62	-0.042*	0.086**	0.092**	-0.028	0.001	0.181**	0.049**	-0.081**	0.040*	0.844**	1.000			
Small acq losses	1.51	2.10	-0.054**	0.235**	0.218**	-0.022	-0.045*	0.017	0.046**	-0.046**	0.132**	0.788**	0.594**	1.000		
Timing of antecedent acq (log)	7.20	7.07	-0.008	-0.207**	-0.082**	-0.013	-0.065**	-0.009	-0.012	0.080**	-0.007	-0.330**	-0.309**	-0.304**	1.000	
Timing of focal acq	7.00	7.18	-0.005	-0.201**	-0.076**	-0.010	-0.051**	0.003	-0.010	0.090**	-0.001	-0.312**	-0.301**	-0.277**	0.867**	1.000

* $p < 0.05$, ** $p < 0.01$ **(N = 2621)**

Table 7: Acquisition Experience Analysis with q

Dependent variable: Tobin's *q*-ratio (1-Week)	Model 1	Model 2	Model 3	Model 4
Constant				
	6.62	6.69	6.40	12.78
Firm size (*z*)	0.01	0.00	0.00*	-0.05
	0.23	0.20	0.05	-1.50
Firm performance	0.00**	0.00**	0.00	0.01
	-0.05	0.08	0.16	0.57
Contested bid	0.00	0.00	0.00**	0.00**
	0.15	0.16	0.09	-0.05
Foreign bid	0.04**	0.04**	0.04**	-0.04**
	2.08	2.04	1.77	-1.96
Business similarity	0.02	0.02	0.01	-0.01
	0.79	0.79	0.27	-0.54
Relative acquisition size	0.02	0.01	0.02	0.00
	0.77	0.74	0.76	0.17
Method of payment (cash=1)	0.02	0.01	0.02	0.00*
	0.78	0.76	0.83	-0.12
Use of advisor	-0.06	-0.06***	-0.05***	-0.01
	-2.80	-2.78	-2.66	-0.60
Acquisition experience	-0.01***	-0.04	0.01	0.02
	-0.17	-0.75	0.21	0.29
Similarity of prior acquisitions	-0.04	0.00*	-0.01	-0.02**
	-0.95	0.03	-0.19	-0.32
Squared term of similarity of prior acquisitions		-0.03	0.02	0.02
		-1.04	0.33	1.05
Small acquisition losses			-0.05	-0.02
			-1.59	-0.63
Timing of prior acquisitions (natural log)			-0.04	0.00**
			-1.23	-0.02
Squared term of timing of prior acquisitions (natural log)				-0.04
				-0.39
Timing of focal acquisition (natural log)			0.00**	0.04
			0.09	0.54
Squared term of timing of focal acquisition (natural log)				-0.02
				-0.22
N	2621	2621	2621	2620
R squared	0.008****	0.008****	0.011****	0.196****

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$, **** $F < 0.01$

*Standardized coefficients reported with standard errors under. Dummy variables not shown.

Table 8: Acquisition Experience Analysis with q

Dependent variable: Tobin's *q*-ratio (3-years)	Model 1	Model 2	Model 3	Model 4
Constant	.883	.878	.971	.095
	6.527	6.340	5.737	.074
Firm size (*z*)	.014	.014	.018	-.024
	.556	.561	.695	-.692
Firm performance	.003*	.002*	.003	.006
	.119	.097	.138	.225
Contested bid	.005	.005	.005	-.008
	.252	.251	.230	-.394
Foreign bid	.083***	.083***	.081***	.034
	3.856	3.858	3.741	1.520
Business similarity	.027	.027	.030	.008
	1.286	1.284	1.393	.347
Relative acquisition size	.022	.022	.022	.012
	1.074	1.078	1.073	.598
Method of payment (cash=1)	.019	.019	.018	-.003
	.898	.899	.858	-.156
Use of advisor	-.072***	-.072***	-.067***	-.017
	-3.370	-3.372	-3.114	-.781
Acquisition experience	-.048	-.044	-.065	-.065
	-1.139	-.836	-.997	-.947
Similarity of prior acquisitions	.004*	-.001**	-.115	.029
	.106	-.024	-1.465	.479
Squared term of similarity of prior acquisitions		.004	.109	.033
		.147	1.461	.414
Small acquisition losses			.010	.034
			.292	.948
Timing of prior acquisitions (natural log)			-.027	-.059
			-.797	-.557
Squared term of timing of prior acquisitions (natural log)				.031
				.293
Timing of focal acquisition (natural log)			.004*	.056
			.121	.735
Squared term of timing of focal acquisition (natural log)				-.046
				-.549
n	2368	2368	2368	2368
R squared	0.008****	0.008****	0.011****	0.196****

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$, **** $F < 0.01$

*Standardized coefficients reported with standard errors under. Dummy variables not shown.

Table 9: Means, Standard Deviation and Correlations q 3-years

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
q 3-years	0.88	1.78	1.00													
Firm size (Z)	2.92	0.93	0.01	1.00												
Firm performance	4.06	10.97	0.00	0.453**	1.00											
Contested bid	0.02	0.14	0.01	0.02	-0.01	1.00										
Foreign bid	0.15	0.36	0.091**	0.280**	0.115**	0.02	1.00									
Business similarity	0.24	0.89	0.02	-0.075**	-0.02	-0.01	-0.01	1.00								
Relative deal size	14.06	207.59	0.02	0.053**	0.04	.098**	-0.02	-0.01	1.00							
Method of payment	0.23	0.42	0.03	0.071**	0.03	-0.02	0.085**	-0.02	-0.03	1.00						
Use of advisor	0.47	0.50	-0.079**	0.214**	0.069**	0.060**	-0.03	-.059**	.048*	-0.03	1.00					
Acq experience	4.79	6.78	-0.047*	0.251**	0.253**	-0.03	0.01	0.124**	.056**	-0.068**	0.136**	1.00				
Similarity of antecedent acquisitions	2.55	3.62	-0.03	0.086**	0.092**	-0.03	0.00	0.181**	0.049*	-0.080**	0.039*	0.844**	1.00			
Small acqlosses	0.15	0.50	-0.03	0.129**	0.060**	-0.01	-0.04	0.00	0.042*	-0.02	0.071**	0.362**	0.261**	1.00		
Timing of antecedent acq (log)	6.76	1.03	0.01	-0.280**	-0.109**	0.00	-.051**	-0.051**	-0.03	0.053**	-0.03	-0.605**	-0.517**	-0.205**	1.00	
Timing of focal acq	5.95	1.85	0.03	-0.200**	-0.124**	0.01	-0.02	-0.044*	-0.03	0.050*	-0.02	-0.510**	-0.495**	-0.185**	0.563**	1.00

* $p < 0.05$, ** $p < 0.01$ (N = 2368)

as did the squared term (see model 4 tables 10 and 11)[15]. Hence the results yield a pattern opposite of what was expected for the findings and suggest a negative relationship. The results are counterintuitive to the market efficiency argument. Since the results from the main test using OLS are non-significant, no claim to support or not for the hypothesis may be made. The correlation as illustrated in Table 10, however, suggests a significant ($p < 0.05$) negative relationship which would reject the $H2_q$.

Using the same definition of small acquisition losses as prior studies, a firm that executed an acquisition that resulted in a recorded *q* depreciation of 3%, the study finds that at the 1 week window any given firm in the sample had, on average, 1.5 small losses (Table 6). However, at the 3-year window, firms experienced only 0.15 small losses (Table 9). We must not be too quick to read into this support that the difference between 1-week and 3-years supports claims that it takes about three years for firms to realize gain from their acquisition activity. In fact, Figure 3 illustrates what the difference between 1-week and 3-years really captures; namely, that after three years, there are more firms that experienced *greater* than 'small' acquisition losses as defined here. The presence of a small acquisition loss as an antecedent condition had a positive but insignificant effect on focal acquisition performance. This would suggest that the greater the number of small losses, the greater the focal performance would be. Although the results are similar to previous findings, since they are not significant, the results are unable to say that there is support for H3. With the larger data set, the results may have greater significance.

[15] None of the variables demonstrated significance in Model 4 *q* at 3 years.

With respect to the effects of timing on acquisition experience, H4Aq predicted an inverted U-shaped relationship between the time between antecedent activities and the focal acquisition's performance. Although the study did not report significant findings, the directionality of the signs suggests a U-shaped relationship, which is contrary to predicted. With respect to H4b, the findings are similar to H4A*q*.

The variation in findings between the various studies (Haleblian and Finkelstein, 1999; Finkelstein and Haleblian, 2002; Hayward, 2002) suggests support that the OLS methodology is inappropriate to the data that we are attempting to model. If the theories held up to testing we would expect to see more similar findings that have been reported in the literature. Therefore, in the next section, the ARIMA models of the data are presented.

4.2. ARIMA MODEL

In this section, report of the findings of the ARIMA models is presented. The next section presents the results of the ARIMA model with transfer functions for CAR. In section 4.2.2, the results for the ARIMA models for *q* are provided.

A first order moving average process is represented by the expression:

$$x_t = \mu + e_t - \theta_1 e_{t-1}$$

and an autoregressive process of zero is represented by the expression:

$$x_t = \mu + \delta_0 e_t$$

Solving for (8) with non-seasonality and considering the ARIMA(0,0,1) yields the following:

$$x_5 = \mu + \delta_0 x_5 + e_t - \theta_1 e_{t-1}$$

4.2.1. CAR

An algorithm in SPSS version 17.0 was used to determine the best specification for competing ARIMA models using the *Expert Modeler* function in the software. The ARIMA model fits and percentage of variance explained by each model of CAR are presented in Appendix E. The R-squared values presented here are "interpreted in the usual way" (Hopwood and McKeown, 1981). However, one should use caution when interpreting the R-squared since it represents the percentage of variation explained on the series as modeled. The Ljung-Box Q (L-B) statistics for *e* at both the three day and one week period are presented in Table 27. The L-B test may be stated as such:

H_0: The data are random.
H_a: The data are not random.

Since the test is non-significant, the null hypothesis cannot be rejected, and therefore, the data appears to be random. This is an important assumption for time series models.

The Expert Modeler function determined that the best model fit for both the 3-day and 1-week periods is ARIMA $(0,0,0)$[16]. Appendix E presents the final estimates for each of the CAR model. Only those independent variables that are significant are included in the final results. In Model 1, only prior experience needs to be differenced by 1 in order to achieve stationarity. Differencing is a data pre-processing step that de-trends the data to control autocorrelation and achieve stationarity by subtracting each datum in a series from its predecessor. Single differencing is used to de-trend linear trends.

[16] A more detailed example of the meaning of the model is presented in the next section.

Tests for the hypotheses were run in a similar way as using OLS. In model 2, there was no significance for any of the hypotheses. With respect to the 1 week period around the time of the announcement, the only thing that this study can say is that relative acquisition size influences acquisition performance with a lag of 2. One would interpret this to mean that the current acquisition's relative size will not be felt for 2 more iterations. In model one, there is support for the H1 ($p < 0.02$). Not included in the findings here is the squared term for experience that allowed for the modeling of the curvilinear relationship. What is particularly interesting is that the evidence suggests that not only is there a curvilinear relationship between source and target problem but also there is a lag (8 iterations) in the realization of the relationship. This suggests that the influences on the target problem will not be realized for eight more acquisitions. Although a timer-series analysis can be coded based on the calendar time of the announcements and performance, this study is interested in the linear progression (count) of activities. Time is included as a variable in the model to test H4a and b. However, since the research is concerned with the series, 'time' is coded as a series count. Therefore, where the model includes a 'lag', it cannot be interpreted as a day, year or other time period; rather, this must be interpreted as the next or previous (delay or lag) acquisition. In Appendix E**Error! Reference source not found.**, indings suggest that H3 is rejected for the 3 day period (see Table 28). H3 predicted an inverted U-shaped relationship between source similarity and target business on focal performance. In fact, the findings predict a positive relationship ($p < 0.01$) with a delay of 5.

While modeling for small losses over the three day period did not support H3 for the three-day window, small losses over the 11-day period did support H3 for Model 1 ($p < 0.01$) with a lag of 3. Therefore, for Model 2 it is still claimed that results are inconclusive, but for model 1 the results support H3. This supports the case of negative transfer acts. The underlying mechanism is

that organizations that experience a small loss look for deeper structures attributable to the loss in order to improve performance in their operations for the next event. The act of encoding and ensuring understanding will result in better organizational routines with respect to acquisitions. There are no statistics reported for timing, and therefore, no claims may be made for support of H4a or b. The next section presents the results for the ARIMA model for *q*. Additionally, all transfer functions are presented in Appendix E.

4.2.2. TOBIN'S Q-RATIO

As with CAR, an algorithm in SPSS version 17.0 is used to determine the best specification of competing ARIMA models using the *Expert Modeler* function in the software. The ARIMA model fits, and percentages of variance explained by each model are presented in Appendix D. As an example of how to interpret the model, Model 6 (the results of M&A 5 years after the announcement as measured by the firm's *q*-ratio) is best specified by ARIMA(0,0,1). ARIMA(0,0,1) has an autoregressive component (0), integrated component (0), and a moving average component (1) (see Table 20, Appendix D). Therefore, in order to predict the AR component, the focal acquisition is only dependent upon itself whereas to predict the MA portion of the model looks back to the previous acquisition experience. None of the L-B were significant (see Table 20, Appendix D). Therefore, all of the models appear to contain random data.

Although it would be possible to go through each of the models and therefore, time periods individually, only those parts that answer the hypotheses in general (not for each year) are presented. However, it is interesting that in many cases, the various models contain different transfer functions that suggest varying modalities to manage M&A activity. In fact, in many of the models, the CAR is significant to the performance and learning associated with *q*. This

suggests that although firm makes decisions about the direction of the organization in order to achieve its goals, it does not do so without feedback from the stockholders. Additionally, Foreign Bid was significant in all but one of the models. The influence of Foreign Bid may be due to the impact it has on the perceived price of the acquisition, thereby driving up the expense of the acquisition.

There are no statistics reported here that would suggest support of H1. Therefore, the results remain inconclusive. In retrospect, the reason that there may be now significance in findings for experience may be due to how 'previous' experience and hence learning is defined in the study. H2 is supported in both Models 2 and 3 ($p < 0.01$). Both Models 2 and 3 are short-term measures (q at 1 day and 1 week) which suggest that similarity of business is important in the short run but that the significance diminishes over time. Small losses in a variety of formats and models display significance which suggests that small losses are watched throughout the M&A process. Small losses in most models exhibit a Delay of 3 which suggests that the loss feeds forward, not backward. H3 is supported.

Only Model 2 (q 1-day) demonstrates significance for the timing variables. However, results in Model 2 suggest, tentatively, support for H4a but not for H4b. Therefore, hypothesis H4b which states that there is a positive relationship between timing of previous experience and target acquisition is not supported.

4.3. COMPARISON OF CAR & *Q*

Table 10 presents the correlations between CAR at both the 3 and 11-day periods and q at all measured periods. There is a significant ($p < 0.01$) relationship between CAR and q in the short-term which is to be expected since the only change to the measurement of q is the change in

stock prices. Although the relationship between *q* and CAR in the short-term is significant, the strength of the relationship is not very strong. Therefore, one might state that there is no difference in either the use of CAR or *q*, and given the ease of calculating CAR, it is more efficient to use this as a proxy for performance of the acquisition. However, in the long-term, both the significance and the relationship diminish, which suggests that CAR is not a good proxy for the long-term performance of the acquisition.

Table 10: Pearson Correlation* - q *and CAR

Variable	Mean	Std. Deviation	1	2	3	4	6	7	8	9
e_{3D}	0.002	0.067	1							
e_{11D}	-0.001	0.084	0.785**	1						
Q_{ANNC}	1.145	2.615	***0.015***	***0.010***	1					
Q_{1D}	1.213	3.195	0.040*	0.046*	0.834**	1				
Q_{1W}	1.145	2.582	***0.020***	***0.025***	0.998**	0.834**	1			
Q_{2Y}	0.976	2.769	***0.039***	***0.027***	0.189**	0.148**	0.197**	1		
Q_{3Y}	0.884	1.785	***0.039***	***0.037***	0.480**	0.459**	0.477**	0.755**	1	
Q_{5y}	0.957	3.301	***0.012***	***0.016***	0.842**	0.795**	0.832**	0.119**	0.805**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10 presents the correlations between *q* and CAR at each of the measurement periods with year controls added. The results maintain significance, but the strength of the relationship between *q* and CAR diminishes at all periods. Interesting to note, in each of the periods except for the 3-day, the mean was a loss of wealth. This suggests that, on average, acquisitions in this sample always lose value.

5. DISCUSSION AND IMPLICATIONS

This work started with the assumption that merger and acquisition forms an important part of an organization's overall strategic orientation. M&A serves as one tactic in an organization's playbook that may help it to achieve focus or generalization, differentiation or cost leadership strategies. Additionally, M&A may help an organization maintain or gain a comparative advantage in an industry through investments that create barriers to entry (Greenwald and Kahn, 2005). The foregoing is predicated on the ability of the firm to manage the M&A process [identify, select, negotiate, acquire, realize synergies].

Results presented here suggest that traditional methodologies that use CAR and OLS only narrowly account for the influence of antecedent events. In fact, as mentioned earlier, others suggest that failure to take into consideration lags in the regression model may lead to over estimations of both the coefficient and levels of significance. Nonetheless, researchers in the M&A domain within the strategy field continue to argue that traditional event study methodologies remain the best mechanism to uncover the mysteries of success in M&A. One criticism raised recently by a researcher for any method other than CAR and OLS in the conduct of event study methodologies for M&A activity is that there are too many 'confounding' events that take place over time that make it difficult to isolate the results of the acquisition from the other noise (McNamara et al., 2008). Further they link event study methodology specifically to CAR to the exclusion of all other measurements and claim that CAR are "more appropriate performance measures" (McNamara et al., 2008: 120) than accounting measures. However, what they may not have taken into consideration is that this study has demonstrated is that there are

other measures (e.g. *Q* measure) that provide more robust understanding of the impact of M&A activity. Where researchers are concerned with discovering the underlying results of an action, *Q* appears to capture more than the market perception of an activity; it captures management's actions and the impact that they have. Take, for instance, the following quote by Dwight Neese, President and CEO of Provident Community Bank (formerly Union Financial):

> "This new corporate identity is more dynamic in nature and reflects the Company's broader market area. Following the recent openings of a satellite office in Westminster Towers and a full-service banking center in Simpsonville and our expected opening of a full-service banking center in Manchester Village in the summer, our branch network will consist of ten offices in five counties - Union, Laurens, Fairfield, York and Greenville. Notwithstanding the name change, the Company will continue to maintain all of its current offices in Union County and offer the same level of products, services and community service to its customers as it has in the past." (Neese, *TheFreeLibrary.com*, 2006)

Union financial decided to change its name to more closely reflect the new strategic form that the company maintained after a series of acquisitions. As the CEO states, the name change reflects the "new corporate identity." This, more than market reaction, is a measure of the action that a company takes that is not captured in the changes of stock price despite the market efficiency hypothesis.

McNamara et al. (2008) raise the concern that during the years that it may take to realize economic profit in the form of accounting measures after an acquisition changes the product mix, investment strategy, management, and additional acquisitions may affect firm performance. In fact, when we research analogical reasoning, we necessarily want to consider these changes. One M&A by a firm typically reflects a series of strategic actions and it is the chain of actions that represent an overall strategy for the firm. If the researcher measures only the market reaction to an announcement, all that he or she captures is an abbreviated window that contains 1) market

perceptions; and, 2) a single action (the announcement) on the part of the firm and not the series of activities that will demonstrate proficiency in the execution of that action.

McNamara et al.'s "extensive review of the literature" (2008: 120) does appear to be correct in the statement that there are other activities that affect measures of performance past the one year window. In fact, Table 10 suggests that this is correct, given that there is no significant relationship between CAR and *q* for the firm past two years. This, however, does not imply that CAR is a better measure of performance nor does it validate that CAR captures *learning* or the ability of the firm to successfully conduct analogical transfer or reasoning. Hayward (2002) and others have claimed that they use an organizational learning perspective to examine how the nature, performance, and timing of a firm's source problem (previous acquisition experience) transfers to a target problem (selection, identification, and consummation of a focal acquisition). In fact, all that they have measured is the ability of the firm to learn and take action on / to market cues in order to maximize shareholder wealth in the short run, not firm performance.

A summary of the findings is presented in Table 11. The findings presented here though tentative, suggest that further research is warranted. The preliminary results suggest that there are significant differences between *Q* and CAR over the long-term. The difference in findings supports claims that true performance of an acquisition may take longer than the typically 270-day period that much research considers.

Table 11: Summary of Hypotheses and Findings

		OLS		ARIMA		OLS		ARIMA
	CAR	CAR	CAR3D	CAR1W	*q*	q1D	q3Y	*q*
H1	*There is a curvilinear relationship between antecedent acquisition experience and firm performance.*	Tentative	Supported	Inconclusive	*There is a positive relationship between antecedent acquisition experience and firm performance.*	Rejected		Inconclusive
H2	*There is an inverted U-shaped relationship between the similarity of the antecedent target business and similarity of focal performance.*	Inconclusive	Rejected	Inconclusive	*There is a positive relationship between the similarity of the antecedent target business and similarity of focal performance.*	Inconclusive		Support for 1 day and 1 week
H3	*The greater the number of small acquisition losses incurred in antecedent acquisitions, the greater the focal performance.*	Supported	Supported	Inconclusive	*The greater the number of small acquisition losses incurred in antecedent acquisitions, the greater the focal performance.*	Inconclusive		Supported
H4a	*There will be a curvilinear relationship between time between the previous acquisition and the focal acquisition and acquisition performance.*	Rejected		Inconclusive	*There will be a curvilinear relationship between time between the previous acquisition and the focal acquisition and acquisition performance.*	Inconclusive		Tentative
H4b	*There will be a curvilinear relationship between average time between acquisitions and acquisition performance.*	Rejected		Inconclusive	*There will be a curvilinear relationship between average time between acquisitions and acquisition performance.*	Inconclusive		Rejected

There is a variety of opportunities for future research. For instance, one area not addressed in this study but may provide further insight is to partition the *Q* data into those acquisitions that start above parity and those that start below. If the literature on high-*Q* firms acquiring low-*Q* firms is accurate, namely that it is a form of market punishment for inefficient management of resources, then firms above unity ought to conduct acquisitions while firms below unit ought not to engage in acquisition activity. Furthermore, if *Q* is an accurate indicator of an ability to manage resources, then we would expect that firms above unity will learn at a faster rate from prior acquisition experience, be able to acquire a large breadth of knowledge, and be able to generalize that knowledge across a larger domain.

Also not conducted here was a time series analysis. Since the data contain information about firms that conduct multiple acquisitions over time, there may be significance to the sequence with which a firm conducts acquisitions. Hence a time series analysis may yield significant insights into the timing, pacing, and order in which the acquisitions occur.

5.1. FUTURE EXTENSIONS

This dissertation has only just begun to address multiple time series data and analysis as it relates to merger and acquisition performance. More specifically, this study has only scratched the surface of the impacts of analogical reasoning and organizational learning in the context of M&A. There is no doubt that M&A will continue to be an important tool in the development and execution of strategy. With respect to the organization, knowing how to manage knowledge gained from the process of M&A will help with the search, identification, selection, and ultimate integration of a future target. The success of future targets, as this study suggests, will depend on previous experience. As the literature on analogical reasoning and transfer suggests, experts are

better at identifying the structure of the target problem than novices, and therefore, where the target problem lacks surface cues, institutionalizing prior experience will foster better future performance.

From the perspective of the stockholder, knowing that market reaction to acquisition announcements does not necessarily predict future performance may help mitigate market 'irrationality' to announcements. Further, knowing that it may take longer than three years to realize synergies from portfolio development may help investors understand the nature of the action taken by management.

There is still a great deal of work employing the methodology of multiple time series analysis in this domain that will build greater understanding. Previous research in this domain has largely been prohibitive due to the cost, both time and financial, that it takes to build the data set. Furthermore, the computational needs have previously been too great. The ability to link databases to near real-time feed to update the model development will greatly enhance the model. Where this dissertation looked at the period around the announcement, 2, 3, and 5 years, a more dynamic model that measures continually for at least each reported quarter from the time of announcement to some time out will greatly enhance findings. Where possible, building a model that will measure from the time of the announcement to a period of at least ten years out, as some have suggested is necessary for full realization, will allow the researcher to identify the inflection point at which the firm begins to realize a profit.

Although others have suggested that there are too many confounding variables that will create 'noise' in the data and hence make it difficult to attribute profit to the acquisition, this research maintains that anything that happens after the acquisition is due to or, at least, influenced by, the

decision to take that acquisition event. Once the event takes place, the firm is irrevocably tied to the events that stream from that point in time. This suggests that should a more robust series of data be built, a more parsimonious time series study may be built that is constructed as a true event study (each acquisition is marked as an ‘event’ in a steam).

APPENDIX A. SUMMARY OF INDUSTRIES & SAMPLE SIZE

Table 12: Sample Summary SIC 10 Through 59

	SIC	Industry	Transactions
Mining	10	METAL MINING	5
	13	OIL AND GAS EXTRACTION	108
	14	NONMETALLIC MINERALS, EXCEPT FUELS	6
Construction	15	GENERAL BUILDLING CONTRACTORS	7
Manufacturing	20	FOOD AND KINDRED PRODUCTS	45
	21	TOBACCO PRODUCTS	2
	22	TEXTILE MILL PRODUCTS	12
	23	APPAREL AND OTHER TEXTILE PRODUCTS	10
	24	LUMBER AND WOOD PRODUCTS	13
	25	FURNITURE AND FIXTURES	1
	26	PAPER AND ALLIED PRODUCTS	24
	27	PRINTING AND PUBLISHING	42
	28	CHEMICALS AND ALLIED PRODUCTS	121
	29	PETROLEUM AND COAL PRODUCTS	34
	30	RUBBER AND MISC. PLASTICS PRODUCTS	21
	31	LEATHER AND LEATHER PRODUCTS	2
	32	STONE, CLAY, AND GLASS PRODUCTS	10
	33	PRIMARY METAL INDUSTRIES	28
	34	FABRICATED METAL PRODUCTS	41
	35	INDUSTRIAL MACHINERY AND EQUIPMENT	83
	36	INDUSTRIAL MACHINERY AND EQUIPMENT	76
	37	TRANSPORTATION EQUIPMENT	67
	38	INSTRUMENTS AND RELATED PRODUCTS	69
	39	MISC. MANUFACTURING INDUSTRIES	6
Transportation, Communications, Electric, Gas, and Sanitary Services	40	RAILROAD TRANSPORTATION	7
	42	TRUCKING AND WAREHOUSING	7
	44	WATER TRANSPORTATION	7
	45	TRANSPORTATION BY AIR	2
	46	PIPELINES, EXCEPT NATURAL GAS	8
	47	TRANSPORTATION SERVICES	4
	48	COMMUNICATION	111
	49	ELECTRIC, GAS, AND SANITARY SERVICES	106
Wholesale Trade	50	WHOLESALE TRADE - DURABLE GOODS	32
	51	WHOLESALE TRADE - NONDURABLE GOODS	28
Retail Trade	53	EATING AND DRINKING PLACES	12
	54	GENERAL MERCHANDISE STORES	14
	56	APPAREL AND ACCESSORY STORES	3
	58	EATING AND DRINKING PLACES	6
	59	MISCELLANEOUS RETAIL	6

Table 13: Sample Summary SIC 60 Through 87

	SIC	Industry	Transactions
Finance, Insurance, and Real Estate	60	DEPOSITORY INSTITUTIONS	727
	61	NONDEPOSITORY INSTITUTIONS	24
	62	SECURITY AND COMMODITY BROKERS	42
	63	INSURANCE CARRIERS	134
	64	INSURANCE AGENTS, BROKERS, & SERVICE	4
	65	REAL ESTATE	6
	67	HOLDING AND OTHER INVESTMENT OFFICES	393
Services	70	HOTELS AND OTHER LODGING PLACES	10
	72	PERSONAL SERVICES	15
	73	BUSINESS SERVICES	47
	78	MOTION PICTURES	12
	79	AMUSEMENT & RECREATION SERVICES	7
	80	HEALTH SERVICES	6
	81	LEGAL SERVICES	4
	87	ENGINEERING & MANAGEMENT SERVICES	5
	55	**TOTALS**	**2622**

APPENDIX B. MATRIX OF ACQUISITION EXPERIENCE THROUGH THE STUDY

Table 14: Acquisition Experiences 1 through 39

Sequence / Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	**Total**
1	46	54	58	53	60	68	63	58	29	55	36	20	8	11	9	**628**
2	14	24	23	49	43	47	56	47	23	24	21	11	5	5	7	**399**
3	3	11	17	25	37	32	47	37	28	24	16	6	6	5	5	**299**
4	1	3	16	20	15	26	33	34	21	17	17	10	3	6	2	**224**
5	1	2	6	20	10	23	25	28	11	13	13	7	3	2	2	**166**
6	0	2	3	9	13	13	20	24	20	6	7	6	2	3	1	**129**
7	0	1	1	8	8	9	18	22	16	9	2	5	3	2	0	**104**
8	0	1	1	6	8	4	14	19	14	11	2	4	1	1	2	**88**
9	0	0	1	4	6	4	12	12	11	13	6	3	3	0	2	**77**
10	0	0	1	2	6	3	8	11	11	12	4	4	2	1	1	**66**
11	0	0	1	0	4	4	6	12	8	9	4	3	0	2	1	**54**
12	0	0	1	0	1	6	4	9	6	6	3	2	1	2	0	**41**
13	0	0	1	0	1	3	5	10	5	4	5	1	1	1	0	**37**
14	0	0	1	0	0	2	4	9	4	4	5	1	1	1	1	**33**
15	0	0	0	1	0	2	3	9	3	3	2	3	1	1	0	**28**
16	0	0	0	1	0	2	1	8	4	1	3	2	0	1	1	**24**
17	0	0	0	1	0	1	1	5	4	3	2	1	0	2	0	**20**
18	0	0	0	0	1	1	1	4	3	2	0	1	1	1	1	**16**
19	0	0	0	0	1	1	1	1	5	1	2	0	1	1	0	**14**
20	0	0	0	0	0	2	1	1	4	1	1	1	0	1	1	**13**
21	0	0	0	0	0	2	1	0	3	2	1	1	0	0	0	**10**
22	0	0	0	0	0	1	2	0	2	3	1	0	0	0	0	**9**
23	0	0	0	0	0	1	2	0	1	2	2	1	0	0	0	**9**
24	0	0	0	0	0	0	3	0	1	1	2	0	0	0	0	**7**
25	0	0	0	0	0	0	3	0	0	1	1	2	0	0	0	**7**
26	0	0	0	0	0	0	3	0	0	1	1	0	1	0	0	**6**
27	0	0	0	0	0	0	3	0	0	1	0	0	1	1	0	**6**
28	0	0	0	0	0	0	3	0	0	1	0	0	0	0	1	**5**
29	0	0	0	0	0	0	2	1	0	1	0	0	0	0	0	**4**
30	0	0	0	0	0	0	1	2	0	1	0	0	0	0	0	**4**
31	0	0	0	0	0	0	1	2	0	1	0	0	0	0	0	**4**
32	0	0	0	0	0	0	1	2	0	1	0	0	0	0	0	**4**
33	0	0	0	0	0	0	1	2	0	0	1	0	0	0	0	**4**
34	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0	**4**
35	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0	**4**
36	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0	**4**
37	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	**2**
38	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	**2**
39	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	**2**

Table 15: Acquisition Experiences 40 through 49

Year / Sequence	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	**Total**
40	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	**2**
41	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	**2**
42	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	**2**
43	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	**2**
44	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	**2**
45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**1**
46	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**1**
47	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**1**
48	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**1**
49	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**1**
																2572
Total	**65**	**98**	**131**	**199**	**214**	**257**	**349**	**385**	**240**	**240**	**167**	**95**	**44**	**51**	**37**	**2572**

APPENDIX C. INDUSTRY ADJUSTED *Q*-RATIOS BY SIC

Table 16: Industry Average* q-*ratios SIC 10 through 29

Two Digit SIC		Industry	N	- 1 M	- 1 W	-1 D	Annc	+ 1 D	+1 W	+2 Y	+3 Y	+5 Y	L&R
Mining	10	METAL MINING	5	14.64	14.31	14.23	14.26	14.34	14.60	0.17	--	--	1.24
	13	OIL AND GAS EXTRACTION	108	1.85	1.52	1.53	1.53	2.69	1.54	2.09	1.33	1.49	2.94
	14	NONMETALLIC MINERALS, EXCEPT FUELS	6	1.60	1.70	1.66	1.65	1.68	1.67	1.24	1.18	1.51	--
Construction	15	GEN BUILD CONTRACTORS	7	1.01	0.97	0.98	0.98	1.00	0.99	0.95	0.91	0.79	--
Manufacturing	20	FOOD & KINDRED PROD	45	2.17	1.95	1.94	1.95	1.97	1.95	1.98	1.99	2.10	1.72
	21	TOBACCO PROD	2	2.76	2.75	2.84	2.77	2.76	2.69	1.95	2.24	3.00	1.39
	22	TEXTILE MILL PRODUCTS	12	0.88	0.88	0.91	0.92	0.93	0.94	0.74	0.75	0.63	.92
	23	APPAREL & OTHER TEXTILE PROD	10	0.89	0.86	0.89	0.89	0.91	0.88	0.77	0.81	0.84	1.13
	24	LUMBER & WOOD PROD	13	0.86	0.90	0.90	0.90	0.94	0.90	0.84	1.01	1.10	1.59
	25	FURNITURE & FIXTURES	1	0.56	0.56	0.55	0.57	0.56	0.57	1.64	1.11	--	.93
	26	PAPER AND ALLIED PROD	24	0.93	0.92	0.92	0.92	0.94	0.93	0.91	0.85	0.91	1.09
	27	PRINTING & PUBLISHING	42	1.35	1.36	1.35	1.35	1.37	1.36	1.42	1.25	1.14	1.66
	28	CHEM & ALLIED PROD	121	2.33	2.29	2.28	2.28	2.32	2.28	2.27	1.92	1.64	2.42
	29	PETROLEUM & COAL PROD	34	0.91	0.93	0.93	0.93	0.94	0.95	0.92	0.91	0.96	1.39
	30	RUBBER & MISC. PLASTICS	21	1.21	1.21	1.21	1.22	1.31	1.23	1.04	0.97	1.03	1.23

Table 17: Industry Average q-ratios SIC 30 through 48

Two Digit SIC		Industry	N	- 1 M	- 1 W	-1 D	Annc	+ 1 D	+1 W	+2 Y	+3 Y	+5Y	L&R
Manufacturing	31	LEATHER AND LEATHER	2	1.70	1.55	1.55	1.56	1.71	1.49	1.45	0.47	0.78	1.66
	32	STONE, CLAY, AND GLASS	10	2.03	2.07	2.07	1.99	2.10	2.09	1.98	1.09	-0.07	1.29
	33	PRIMARY METAL IND	28	1.05	1.08	1.11	1.09	1.17	1.10	0.93	0.91	0.76	.85
	34	FABRICATED METAL	41	0.85	0.85	0.84	0.85	0.87	0.86	0.66	0.71	0.79	1.04
	35	IND MACH & EQUIP	83	1.69	1.72	1.70	1.76	1.84	1.72	0.73	1.25	3.74	1.67
	36	IND MACH & EQUIP	76	1.81	2.07	2.05	2.04	1.95	2.03	1.36	1.24	1.09	1.79
	37	TRANS EQUIPMENT	67	1.05	1.05	1.06	1.05	1.06	1.06	0.90	0.89	0.91	1.17
	38	INSTRUMENTS & RELATED PROD	69	1.53	1.53	1.53	1.56	1.64	1.54	1.40	1.36	1.35	3.08
	39	MISC. MAN IND	6	1.64	1.63	1.65	1.64	1.63	1.50	0.72	0.65	0.61	1.33
	40	RAILROAD TRANSPORTATION	7	0.94	0.94	0.96	0.96	0.96	0.96	0.88	0.86	0.74	--
Transportation, Communications, Electric, Gas, and Sanitary Services	42	TRUCKING AND WAREHOUSING	7	3.57	4.00	3.99	3.97	3.61	3.91	1.89	2.01	6.12	--
	44	WATER TRANSPORTATION	7	1.87	1.91	1.92	1.92	1.93	1.94	1.45	1.16	1.12	--
	45	TRANSPORTATION BY AIR	2	1.72	1.71	1.69	1.75	1.79	1.77	1.18	1.15	1.63	--
	46	PIPELINES, EXCEPT NATURAL GAS	8	7.77	7.89	7.91	7.96	8.14	7.97	1.42	1.25	1.17	--
	47	TRANSPORTATION SRV	4	0.91	0.89	0.87	0.89	0.91	0.89	1.28	1.48	1.20	--
	48	COMMUNICATION	111	1.58	1.64	1.64	1.64	1.69	1.64	1.24	1.10	1.11	1.08

Table 18 : Industry Average q-ratios SIC 49 through 67

Two Digit SIC		Industry	N	- 1 M	- 1 W	-1 D	Annc	+ 1 D	+1 W	+2 Y	+3 Y	+5Y	L&R
	49	ELECTRIC, GAS, AND SANITARY SERVICES	106	1.13	1.08	1.09	1.10	1.09	1.10	0.86	0.84	0.86	0.94
	50	WHOLESALE TRADE - DURABLE GOODS	32	2.70	2.72	2.74	2.64	2.65	2.65	1.21	1.10	2.57	--
Wholesale Trade	51	WHOLESALE TRADE - NONDURABLE GOODS	28	1.01	0.98	0.98	0.91	0.94	0.92	0.85	0.82	0.87	1.35
	53	EAT & DRINKING PLACES	12	1.03	1.03	1.00	1.00	1.04	1.02	1.00	1.04	1.02	1.42
Retail Trade	54	GEN MERCH STORES	14	1.50	1.45	1.44	1.44	1.51	1.48	1.16	1.21	0.82	1.23
	56	APPAREL & ACCESSORY STORES	3	0.64	0.61	0.59	0.59	0.67	0.61	1.08	2.22	2.12	--
	58	EATING & DRINKING PL	6	0.93	0.90	0.89	0.89	0.91	0.89	0.95	0.81	0.75	--
	59	MISCELLANEOUS RETAIL	6	1.45	1.34	1.35	1.38	1.44	1.37	1.32	1.35	0.97	1.41
	60	DEPOSITORY INST	727	0.32	0.32	0.32	0.32	0.32	0.32	0.28	0.28	0.30	--
Finance, Insurance, and Real Estate	61	NONDEPOSITORY INST	24	0.67	0.68	0.68	0.67	0.70	0.68	0.63	0.51	0.58	--
	62	SEC & COMMODITY BROKERS	42	0.44	0.46	0.45	0.45	0.45	0.45	0.51	0.45	0.48	--
	63	INS CARRIERS	134	0.71	0.77	0.77	0.79	0.80	0.78	0.59	0.53	0.66	--
	64	INS AGENTS, BROKERS, & SRV	4	14.58	15.13	15.10	15.07	15.10	15.67	13.01	0.23	--	--
	65	REAL ESTATE	6	1.33	1.39	1.37	1.34	1.42	1.32	0.87	0.78	1.00	--
	67	HOLDING & OTR INV OFF	393	1.10	1.07	1.07	1.07	1.12	1.08	0.96	1.01	1.05	--

Table 19: Industry Average q-ratios SIC 70 through 87 and Summary

Two Digit SIC		Industry	N	- 1 M	- 1 W	-1 D	Annc	+ 1 D	+1 W	+2 Y	+3 Y	+5Y	L&R
Services	70	HOTELS & OTR LODGING	10	0.88	0.88	0.88	0.88	0.92	0.88	0.93	1.03	0.98	--
	72	PERSONAL SRVS	15	0.92	0.92	0.92	0.92	0.93	0.92	0.86	0.82	0.56	--
	73	BUSINESS SRVS	47	2.54	2.70	2.68	2.65	2.70	2.55	3.93	2.80	1.61	--
	78	MOTION PICTURES	12	1.36	1.38	1.39	1.39	1.38	1.39	1.23	1.39	1.92	--
	79	AMUSEMENT & REC SRVS	7	0.77	0.81	0.81	0.81	0.80	0.82	0.85	0.72	0.90	--
	80	HEALTH SRVS	6	2.45	2.51	2.37	2.30	2.22	2.26	--	--	--	--
	81	LEGAL SERVICES	4	1.07	1.07	1.09	1.08	1.09	1.07	1.07	1.20	1.14	--
	87	ENG & MGNT SRVS	5	2.06	1.91	1.90	1.93	1.77	1.74	1.59	1.83	2.45	--
	54	TOTALS	2622	1.15	1.15	1.14	1.14	1.21	1.14	0.98	0.88	0.96	

APPENDIX D. ARIMA MODEL AND TRANSFER FUNCTIONS FOR *q*

In this appendix, the six models developed for Tobin's Average *q*-ratio are provided for each period in the study. All data was used in the following models. Table 20 provides the model summary information to include the Ljung-Box *Q* statistic. Of particular interest is Model_3 which has a particularly poor L-B statistic. Table 21 through Table 26 provide the full model with transfer functions for each of the time periods.

***Table 20: ARIMA Model Parameters for* q**

Model Description			Model Type	R-Squared	Ljung-Box Q(18)		
					Statistics	DF	Sig.
Model ID	q_{Annc}	Model_1	ARIMA(0,0,0)	0.998	14.061	18	0.725
	q_{1D}	Model_2	ARIMA(0,0,0)	0.895	18.446	18	0.427
	q_{1W}	Model_3	ARIMA(1,0,12)	0.996	32.185	15	0.006
	q_{2Y}	Model_4	ARIMA(0,0,0)	0.061	11.420	18	0.876
	q_{3Y}	Model_5	ARIMA(0,0,9)	0.260	8.089	16	0.946
	q_{5Y}	Model_6	ARIMA(0,0,1)	0.728	14.450	17	0.635

Table 21: **q at Announcement**

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
Model_1$_{q\text{Annc}}$	q_{Annc}	No	Constant		-0.018	0.003	-5.948	0.000	-0.018
	$q_{1\text{MP}}$	No	Numerator	Lag 0	0.023	0.004	6.574	0.000	$(0.023)(q_{1\text{MP}})$
	$q_{1\text{WP}}$	No	Numerator	Lag 0	0.381	0.021	17.904	0.000	$(0.381-0.059B^2)(q_{1\text{WP}})$
				Lag 2	0.059	0.022	2.692	0.007	
	$q_{1\text{DP}}$	No	Numerator	Lag 0	0.613	0.022	27.907	0.000	
				Lag 2	-0.059	0.022	-2.681	0.007	$(0.613+0.059B^2)(q_{1\text{WP}})$
	For_Bid	No		Delay	6.000				$(-0.018)(\text{For\_Bid}_{t+6})$
			Numerator	Lag 0	-0.018	0.007	-2.697	0.007	
$y=(-0.018)+(0.023)(q_{1\text{MP}})+(0.381-0.059B^2)(q_{1\text{WP}})+(0.613+0.059B^2)(q_{1\text{WP}})+(-0.018)(\text{For\_Bid}_{t+6})+\alpha t$									

Table 22: **q** *at One Day after Announcement*

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
Model_2$_{q1D}$	q_{1D}	No		Constant	-0.131	0.029	-4.574	0.000	-0.131
		No		Delay	2.000				(0.115)(q_{1Dt+2})
			Numerator	Lag 0	0.115	0.042	2.753	0.006	
	q_{1MP}	No	Numerator	Lag 0	1.316	0.030	44.510	0.000	(1.316)(q_{1MP})
	q_{1WP}	No	Numerator	Lag 0	-0.225	0.029	-7.736	0.000	(-0.225)(q_{1WP})
	Buss_Sim	No		Delay	6.000				(0.002)(Buss_Sim$_{t+6}$)
			Numerator	Lag 0	0.002	0.001	2.683	0.007	
	e_{3D}	No	Numerator	Lag 0	0.998	0.303	3.293	0.001	(0.998)(e_{3D})
	Time$_P$	No	Numerator	Lag 0	0.000	0.000	4.664	0.000	((3.42(E-8)+3.95(E-8*B*))/(-1.113B+0.504B2))(Time$_{PR}$)
				Lag 1	0.000	0.000	-6.306	0.000	
			Denominator	Lag 1	-1.113	0.086	-12.942	0.000	
				Lag 2	-0.504	0.082	-6.139	0.000	
	Time$_{FCL}$	No	Numerator	Lag 0	0.000	0.000	-3.264	0.001	0.000

$$y=(-0.131)+(0.115)(q_{1Dt+2})+(1.316)(q_{1MP})+(-0.225)(q_{1WP})+(0.002)(\text{Buss\_Sim}_{t+6})+(0.998)(e_{3D})+((3.42(\text{E-}8)+3.95(\text{E-}8B))/(-1.113B+0.504B^2))(\text{Time}_{PR})+\alpha t$$

Table 23: **q** *at One Week after Announcement*

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
Model_3	q_{1W}	No	AR	Lag 1	-0.490	0.162	-3.026	0.003	$(-0.490)(q_{1W})$
			MA	Lag 1	-0.519	0.158	-3.291	0.001	$(-0.519B+0.071B^{12})(q_{1W})$
				Lag 12	-0.071	0.019	-3.795	0.000	
	Sml_Loss_{q1W}	No		Delay	7.000				$(0.007)(Sml\_Loss_{q1Wt+7})$
			Numerator	Lag 0	0.007	0.003	2.288	0.022	
	q_{1MP}	No	Numerator	Lag 0	0.022	0.004	5.016	0.000	$(0.022)(q_{1MP})$
	q_{1WP}	No	Numerator	Lag 0	0.375	0.027	13.887	0.000	$(0.375-0.111B^2)(q_{1WP})$
				Lag 2	0.111	0.028	3.988	0.000	
	q_{1DP}	No	Numerator	Lag 0	0.610	0.028	21.881	0.000	$(0.610+0.111B^2)(q_{1DP})$
				Lag 2	-0.111	0.028	-3.947	0.000	
	Sim_Prior	No		Delay	4.000				$(0.028)(Sim\_Prior_{t+4})$
			Numerator	Lag 0	0.028	0.008	3.386	0.001	
	Buss_Sim	No		Delay	8.000				$(0.000)(Buss\_Sim_{t+8})$
			Numerator	Lag 0	0.000	0.000	-2.110	0.035	
	Sml_Loss_{e3D}	No		Delay	1.000				$(-0.003/0.570B^2)(Sml\_Loss_{e1Wt+1})$
			Numerator	Lag 0	-0.003	0.001	-3.367	0.001	
			Denominator	Lag 2	0.570	0.162	3.517	0.000	
	Sml_Loss_{e1W}	No		Delay	7.000				$(-0.004)(Sml\_Loss_{e1Wt+7})$
			Numerator	Lag 0	-0.004	0.002	-1.907	0.057	
	For Bid	No		Delay	6.000				$(-0.024)(For\_Bid_{t+6})$
			Numerator	Lag 0	-0.024	0.008	-2.910	0.004	
	Adv	No		Delay	4.000				$(0.012)(Adv_{t+4})$
			Numerator	Lag 0	0.012	0.006	2.156	0.031	

$$y=(0.007)(Sml\_Loss_{q1Wt+7})+(0.022)(q_{1MP})+(0.375-0.111B2)(q_{1WP})+(0.610+0.111B^2)(q_{1DP})+(0.028)(Sim\_Prior_{t+4})+0+(-0.003/0.570B^2)(Sml\_Loss_{e1Wt+1})+(-0.004)(Sml\_Loss_{e1Wt+7})+(-0.024)(For\_Bid_{t+6})+(0.012)(Adv_{t+4})+[((-0.519B+0.071B12)/(-0.490B))\alpha_t]$$

Table 24: **q** *at Two Years after Announcement*

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
Model_4	q_{2Y}	No		Constant	0.589	0.093	6.345	0.000	0.059
	Sml_Loss$_{q2Y}$	No		Delay	3.000				(0.192)(Sml_Loss$_{q2Yt+3}$)
			Numerator	Lag 0	0.192	0.101	1.899	0.058	
	Sml_Loss$_{q5Y}$	No		Delay	3.000				(0.202)(Sml_Loss$_{q5Yt+3}$)
			Numerator	Lag 0	0.202	0.080	2.524	0.012	
	q_{1MP}	No	Numerator	Lag 0	0.233	0.024	9.749	0.000	(0.233)(q_{1MP})
	For Bid	No	Numerator	Lag 0	0.739	0.152	4.872	0.000	(0.739)(For_Bid)
	Adv	No	Numerator	Lag 0	-0.238	0.108	-2.203	0.028	(-0.238)(Adv)
	Pay	No		Delay	6.000				(-1.234)(Pay$_{t+6}$)
			Numerator	Lag 0	-1.234	0.299	-4.128	0.000	
	Fin	No		Delay	6.000				(0.011)(Fin$_{t+6}$)
			Numerator	Lag 0	0.011	0.003	3.914	0.000	

$$y=0.059+(0.192)(\text{Sml\_Loss}_{q2Yt+3})+(0.202)(\text{Sml\_Loss}_{q5Yt+3)}+(0.233)(q_{1MP})+(0.739)(\text{For\_Bid})+(-0.238)(\text{Adv})+(-1.234)(\text{Pay}_{t+6})+(0.011)(\text{Fin}_{t+6})+\alpha_t$$

Table 25: **q** *at Three Years after Announcement*

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
Model_5	q_{3Y}	No		Constant	0.437	0.051	8.543	0.000	0.437
			MA	Lag 1	-0.009	0.021	-0.409	0.683	$(-0.009B+0.016B^{9})(q_{3Y})$
				Lag 9	0.016	0.021	0.754	0.451	
	Sml_Loss_{q2Y}	No		Delay	3.000				$(0.158)(Sml\_Loss_{q2Yt+3})$
			Numerator	Lag 0	0.158	0.059	2.667	0.008	
	Sml_Loss_{q5Y}	No		Delay	3.000				$(0.138)(Sml\_Loss_{q5Yt+3})$
			Numerator	Lag 0	0.138	0.049	2.839	0.005	
	q_{1MP}	No	Numerator	Lag 0	0.290	0.045	6.375	0.000	$(0.290)(_{q}1MP)$
	q_{1WP}	No	Numerator	Lag 0	1.548	0.289	5.350	0.000	$(1.548)(q_{1WP})$
	q_{1DP}	No	Numerator	Lag 0	-1.465	0.300	-4.875	0.000	$(-1.465)(q_{1DP})$
	For Bid	No	Numerator	Lag 0	0.344	0.089	3.865	0.000	(0.344)(For_Bid)
	Adv	No	Numerator	Lag 0	-0.157	0.064	-2.458	0.014	(-0.157)(Adv)

$$y=0.437+(0.158)(Sml\_Loss_{q2Yt+3})+(0.138)(Sml\_Loss_{q5Yt+3})+(0.290)(q_{1MP})+(1.548)(q_{1WP})+(-1.465)(q_{1DP})+(0.344)(For\_Bid)+(-0.157)(Adv)+[(-0.009B+0.016B9)(q3Y)\alpha_{t}]$$

Table 26: **q** *at Five Years after Announcement*

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
Model_6	q_{5Y}	No		Constant	-0.439	0.048	-9.214	0.000	-0.439
			MA	Lag 1	-0.072	0.024	-2.997	0.003	$(-0.072B)(q_{5Y})$
	q_{1MP}	No	Numerator	Lag 0	0.460	0.053	8.620	0.000	$(0.460)(q_{5Y})$
	q_{1WP}	No	Numerator	Lag 0	4.899	0.363	13.493	0.000	$(4.899)(q_{1WP})$
	q_{1DP}	No	Numerator	Lag 0	-4.084	0.380	-10.749	0.000	$(-4.084)(q_{1DP})$
	e_{1WK}	No		Delay	7.000				$(0.451-1.188B)(e_{1WKt+7})$
			Numerator	Lag 0	0.451	0.489	0.922	0.356	
				Lag 1	-1.188	0.497	-2.391	0.017	
	For Bid	No		Delay	1.000				$(0.321)(For\_Bid_{t+1})$
			Numerator	Lag 0	0.321	0.105	3.065	0.002	

$$y=(-0.439)+(0.460)(q_{5Y})+(4.899)(q_{1WP})+(-4.084)(q_{1DP})+(0.451-1.188B)(e_{1WKt+7})+(0.321)(For\_Bid_{t+1})+[(-0.072B)(q_{5Y})\alpha_t]$$

APPENDIX E. ARIMA MODEL AND TRANSFER FUNCTIONS FOR CAR

In this appendix, the two models developed for Cumulative Abnormal Returns are provided for each period in the study. All data was used in the following models. Table 27 provides the model summary information to include the Ljung-Box Q statistic. Table 28 and Table 29 provide the full models with transfer functions for each of the time periods.

Table 27: ARIMA Model Parameters for CAR

Model Description			Model Type	R-squared	Ljung-Box Q(18)		
					Statistics	DF	Sig.
Model ID	e_{3D}	Model_1	ARIMA(0,0,0)	0.026	9.605	18	0.944
	e_{1W}	Model_2	ARIMA(0,0,0)	0.013	10.846	18	0.901

Table 28: CAR at One Day after Announcement

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
Model 1_{e3D}	For_Bid	No	Numerator	Lag 0	0.010	0.003	2.870	0.004	$(0.010)(For\_Bid_t)$
	Rel_Sz	No	Numerator	Lag 0	0.000	0.000	3.226	0.001	$(0.00002)(Rel\_Sz_t)$
	Adv	No	Numerator	Lag 0	-0.006	0.002	-2.679	0.007	$(-0.006)(Adv_t)$
	Exp	No		Delay	8				$(-0.23)(Exp_{t+8}-Exp_{t+7})$
			Numerator	Lag 0	-0.023	0.010	-2.244	0.025	
				Difference	1				
	Sim	No		Delay	5				
			Numerator	Lag 0	0.002	0.001	4.152	0.000	$(0.002)(Sim_{t+5})$
	Sml_Loss_{e1W}	No	Numerator	Lag 0	-0.002	0.001	-2.532	0.011	$(-0.022-0.003B^3)(Sml\_Loss_{e1W})$
				Lag 3	0.003	0.001	3.634	0.000	
	Exp	No		Delay	3				$(0.002)(Exp_{t+3})$
			Numerator	Lag 0	0.002	0.001	3.070	0.002	
$y=(0.010)(For\_Bid_t)+(0.00002)(Rel\_Sz_t)+(-0.006)(Adv_t)+(-0.23)(Exp_{t+8}-Exp_{t+7})+(0.002)(Sim_{t+5})+(-0.022-0.003B^3)(Sml\_Loss_{e1W})+(0.002)(Exp_{t+3})+\alpha_t$									

Table 29: CAR at Five Days after Announcement

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
Model 2_{e1W}	Rel_Sz	No		Delay	2				$(-0.00004)(Rel\_Sz_{t+2})$
			Numerator	Lag 0	0.000	0.000	-4.979	0.000	
	Adv	No	Numerator	Lag 0	-0.007	0.002	-2.818	0.005	$(-0.007)(Adv_t)$
$y=(-0.00004)(Rel\_Sz_{t+2})+(-.007)(Adv_t)+\alpha_t$									

APPENDIX F. ARIMA MODEL AND TRANSFER FUNCTIONS FOR SIC 28 *q*

Appendix C is the ARIMA model and transfer functions for Standard Industrial Classification (SIC) code 28 (Chemicals and Allied Products). SIC 28 was chosen as an illustrative example since it demonstrates the pattern that was anticipated ex ante for the model; namely, that the model fit ratios got progressively worse as the years progressed. Tables Table 30 through Table 36 contain the ARIMA model parameters and transfer functions for each of the time periods' *q* at the announcement, one-day, one-week, two, three, and five-years after the announcement.

Table 30: ARIMA Model Parameters for SIC 28

Model Statistics

Model	Number of Predictors	Model Fit statistics					Ljung-Box Q(18)			Number of Outliers
		Stationary R-squared	R-squared	RMSE	MAPE	MAE	Statistics	DF	Sig.	
q_{Annc}	3	0.997	0.997	0.092	2.167	0.049	16.863	18	0.533	0
q_{1D}	5	0.996	0.997	0.086	2.577	0.055	10.539	18	0.913	0
q_{1W}	2	0.997	0.995	0.106	2.955	0.068	12.415	18	0.825	0
q_{2Y}	5	0.783	0.743	0.880	40.000	0.551	38.343	18	0.003	0
q_{3Y}	5	0.354	0.354	1.491	430.530	1.002	21.669	17	0.198	0
q_{5Y}	1	0.087	0.087	1.646	700.624	1.228	33.255	17	0.010	0

Table 31: **q** *SIC 28 at Announcement*

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
q_{Annc}	q_{1DP}	Natural Log	Numerator	Lag 0	1.00	0.00	262.57	0.00	$(0.999)(q_{1DPt})$
				Delay	3.00				$(-0.002/-0.86B)(\text{Sml\_Loss}q_{2Yt+3})$
	Sml_Loss_{q2Y}	No	Numerator	Lag 0	-0.02	0.01	-4.20	0.00	
			Denominator	Lag 1	-0.86	0.06	-14.29	0.00	
	e_{3D}	No	Numerator	Lag 0	0.58	0.10	5.95	0.00	$(0.58+0.25B^6)(e_{3Dt})$
				Lag 6	0.25	0.10	2.58	0.01	
$y=(0.999)(q_{1DPt})+(-0.002/-0.86B)(\text{Sml\_Loss}_{q2Yt+3})+(0.58+0.25B^6)(e_{3Dt})+\alpha_t$									

Table 32: **q** *SIC 28 at One Day after Announcement*

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
q_{1D}	q_{1MP}	Natural Log	Numerator	Lag 0	0.08	0.03	2.51	0.01	$(0.08)(q_{1MPt})$
	q_{1DP}	Natural Log	Numerator	Lag 0	0.92	0.03	28.12	0.00	$(0.92)(q_{1DPt})$
	Sml_Loss_{q2Y}	No		Delay	4.00				$(0.03)(\text{Sml\_Loss}_{q2Yt+4})$
			Numerator	Lag 0	0.03	0.01	4.12	0.00	
	Sml_Loss_{q5Y}	No	Numerator	Lag 0	0.03	0.01	3.32	0.00	$(0.03)(\text{Sml\_Loss}_{q5Yt})$
	e_{3D}	No	Numerator	Lag 0	1.01	0.11	8.98	0.00	$(1.01)(e_{3Dt})$
$y=(0.08)(q_{1MPt})+(0.92)(q_{1DPt})+(0.03)(\text{Sml\_Loss}_{q2Yt+4})+(0.03)(\text{Sml\_Loss}_{q5Yt})+(1.01)(e3Dt)+\alpha_t$									

Table 33: **q** *SIC 28 at One Week after Announcement*

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
q_{1W}	q_{1DP}	Natural Log	Numerator	Lag 0	0.99	0.00	269.05	0.00	$(0.99)(q_{1DPt})$
	e_{3D}	No	Numerator	Lag 0	1.11	0.09	11.68	0.00	$(1.11)(e_{3Dt})$
$y=(0.99)(q_{1DPt})+(1.11)(e_{3Dt})+\alpha_t$									

Table 34: **q** *SIC 28 Two Years after Announcement*

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
q_{2Y}	q_{2Y}	Square Root		Constant	-0.97	0.24	-4.06	0.00	(-0.97)
	q_{1WP}	Square Root	Numerator	Lag 0	1.73	0.40	4.28	0.00	$(1.73)(q_{1WPt})$
	q_{1DP}	Square Root	Numerator	Lag 0	-1.08	0.40	-2.68	0.01	$(-1.08)(q_{1DPt})$
	Sim_Prior	No		Delay	3.00				$(0.32/0.67B^2)(\text{Sim\_Prior}_{t+3})$
			Numerator	Lag 0	0.32	0.08	4.14	0.00	
			Denominator	Lag 2	0.67	0.11	6.06	0.00	
	Buss_Exp	No	Numerator	Lag 0	-0.02	0.01	-2.56	0.01	$(-0.02/0.87B2)(\text{Buss\_Exp}_t)$
			Denominator	Lag 2	0.87	0.07	13.38	0.00	
	Rel_Sz	Square Root	Numerator	Lag 0	0.81	0.15	5.54	0.00	$(0.81)(\text{Rel\_Sz}_t)$
$y=(-0.97)+(1.73)(q_{1WPt})+(-1.08)(q_{1DPt})+(0.32/0.67B^2)(\text{Sim\_Prior}_{t+3})+(-0.02/0.87B^2)(\text{Buss\_Exp}_t)+(0.81)(\text{Rel\_Sz}_t)+\alpha_t$									

Table 35: **q** *SIC 28 Two Years after Announcement*

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
q_{3Y}	q_{3Y}	No	MA	Lag 1	-0.22	0.10	-2.31	0.02	$(-0.22B)(q_{3Yt})$
	q_{1WP}	No	Numerator	Lag 0	2.79	0.65	4.30	0.00	$(2.79)(q_{1WPt})$
	q_{1DP}	No	Numerator	Lag 0	-2.36	0.65	-3.63	0.00	$(-2.36)(q_{1DPt})$
	Sim_Prior	No		Delay	3.00				$(1.28)(\text{Sim\_Prior}_{t+3})$
		No	Numerator	Lag 0	1.28	0.48	2.66	0.01	
	Sum_Prior	No		Delay	2.00				$(-0.08)(\text{Sum\_Prior}_{t+2})$
			Numerator	Lag 0	-0.08	0.03	-2.55	0.01	
	Rel_Sz	No		Delay	2.00				$(0.29)(\text{Rel\_Sz}_{t+2})$
			Numerator	Lag 0	0.29	0.09	3.31	0.00	

$$y=(2.79)(q_{1WPt})+(-2.36)(q_{1DPt})+(1.28)(\text{Sim\_Prior}_{t+3})+(-0.08)(\text{Sum\_Prior}_{t+2})+(0.29)(\text{Rel\_Sz}_{t+2})+(-0.22B)(q_{3Yt})\alpha_t$$

Table 36: **q** *SIC 28 Five Years after Announcement*

Model	I.V.s	Transformation	Position		(ω(*B*))/(δ(*B*))	SE	*t*	Sig.	Transfer Function
q_{5Y}	q_{5Y}	No		Constant	2.15	0.29	7.31	0.00	2.15
			AR	Lag 1	0.21	0.11	1.97	0.05	$(0.21B)(q_{5Yt})$
	q_{1M}	No		Delay	5.00				$(-0.20)(_{q1Mt+5})$
			Numerator	Lag 0	-0.20	0.09	-2.19	0.03	

$$y=(2.15)+(-0.20)(_{q1Mt+5})+[(1/(0.21B)(q_{5Yt}))\alpha_t]$$

BIBLIOGRAPHY

Adams, A.J., and Moriarty, M.M. (1981). The Adevertising-Sales Relationship: Insights from Tranfer-Function Modeling. *Journal of Adevertising Research*, 21(3):41–46.

Agrawal, A., Jaffe, J. F., and Mandelker, G. N. (1992). The Post-Merger Performance of Acquiring Firms: A Re-examination of an Anomaly. *Journal of Finance*, 47(4): 1605-1621.

Ahuja, G. and Katila, R. (2001). Technological Acquisitions and the Innovation Performance of Acquiring Firms: A Longitudinal Study. *Strategic Management Journal*, 22(3): 197-220.

Amburgey, T.L. and Miner, A.S. (1992). Strategic Momentum, the Effects of Repetitive, Positional, and Contextual Momentum on Merger Activity. *Strategic Management Journal*, 13: 335-48.

Anand, J.and Singh H. (1997). Asset redeployment, Acquisitions and corporate strategy in declining industries. *Strategic Management Journal*, 14: 33-46.

Anderson E.W., Fornell C., and Mazvancheryl. (2004). Customer Satisfaction and Shareholder Value. *Journal of Marketing* 68: 172-185

Argote, L., Beckman, S. L., and Epple, D. (1990). The Persistence and Transfer of Learning in Industrial Settings. *Management Science*, 36(2): 140-154.

Argyris, C., and Schon, D. (1978). *Organizational Learning: A Theory of Action Perspective*. Reading, Mass: Addison Wesley.

Ashby, W. Ross (1956). *An Introduction to Cybernetics*. London: Chapman & Hall.

Baker, George P. (1992). Beatrice: A study in the Creation and Destruction of Value. *Journal of Finance*, 47: 1081–1119.

Baker, J.B. and Bresnahan, T.F. (1985). The Gain from Merger or Collusion in Product-Differentiated Industries. *The Journal of Industrial Economics*. 33: 427–444.

Bapuji, H. and Crossan, M. (2004). From Questions to Answers: Reviewing Organizational Learning Research. *Management Learning*, 35(4): 397-417.

Barkema, H. G., Baum, J. A. C., and Mannix, E. A. (2002). Management Challenges in a New Time. *Academy of Management Journal*, 45(5): 916-930.

-- and Schijven, M. (2008). How Do Firms Learn to Make Acquisitions? A Review of Past Research and an Agenda for the Future. *Journal of Management*, 34(3): 594-634.

Barney, Jay B. (1986). Strategic Factor Markets: Expectations, Luck, and Business Strategy. *Management Science*, 32(10): 1231 – 1241.

Barney, Jay B. and Hesterley, William S. (2006). *Strategic Management and Competitive Advantage: Concepts*, Boston, MA: Pearson Prentice Hall.

Barton, D. and Sherman, R. (1984). The Price and Profit Effects of Horizontal Mergers: A Case Study. *Journal of Industrial Economics* 33: 165-177.

Baum J.A.C., Li S. X. and Usher J.M. (2000). Making the Next Move: How Experiential and Vicarious Learning Shape the Locations of Chains' of Acquisitions - Statistical Data Included. *Administrative Science Quarterly* 45: 766-801

Blose, L. E. and Shieh, Joseph C. P. (1997). Tobin's *Q*-Ration and Market Reaction to Capital Investment Announcements. *The Financial Review*, 32(3): 449-476.

Bochenski, I.M. *Ancient Formal Logic*, Amsterdam: 36 – 54.

Box, G.E.P., and Jenkins, G.M. (1976). *Time Series Analysis: Forecasting and Control*. San Francisco: Holden-Day.

Box-Steffensmeier, J.M. and Jones, B.S. (1997). Time is of the Essence: Event History Models in Political Science. *American Journal of Political Science*, 41(4): 1414 – 1461.

Brown S.L. and Eisenhardt K.M. (1997). The Art of Continuous Change: Linking Complexity Theory and Time-paced Evolution in Relentlessly Shifting Organizations. *Administrative Science Quarterly*, 42: 1-34.

Burt, R. (1980). Autonomy in a Social Topology. *American Journal of Sociology*, 85(4): 892-925.

Business Wire (2006). Union Financial Bancshares, Inc. Changes Name to Provident Community Bancshares, Inc. *The Free Library*, Accessed 19 April, 2009. Available at: http://www.thefreelibrary.com/Union+Financial+Bancshares,+Inc.+Changes+Name+to+Provident+Community...-a0144679304

Capron, L. (1999). The Long-Term Performance of Horizontal Acquisitions. *Strategic Management Journal*, 20(11): 987-1018.

Capron, L., Mitchell, W., and Swaminathan, A. (2001). Asset Divestiture Following Horizontal Acquisitions: A Dynamic View. *Strategic Management Journal*, 22(9): 817.

Cartwright, S. and Schoenberg, R. (2006). Thirty Years of Mergers and Acquisitions Research: Recent Advances and Future Opportunities. *British Journal of Management*, 17: S1-S5.

Castanias R.P. and Helfat, C.E., (1991). Managerial Resources and Rents. *Journal of Management*, 17(1): 155-171.

Chen, C.J. (2004.) The Effects of Knowledge Attribute, Alliance Characteristics, and Absorptive Capacity on Knowledge Transfer Performance. *R&D Management*, 34(3): 311-321.

Cheng Y.T. and Van de Ven A.H. (1996). Learning the Innovation Journey: Order Out of Chaos? *Organization Science*, 7: 593 – 605.

Chung K.H. and Pruitt, S.W. (1994). A Simple Approximation of Tobin's q. *Financial Management*, 23(3): 70 – 74.

Coase, R. (1937). The Nature of the Firm. *Economica*, 4(16): 386-405.

Cohen W.M. and Levinthal, D.A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35: 128 – 152.

Cording M, Christmann P. and King D.R. (2008). Reducing Causal Ambiguity in Acquisition Integration: Intermediate Goals as Mediators of Integration Decisions and Acquisition Performance. *Academy of Management Journal*, 51(4): 744-767

Cormier, S., and Hagmam, J. (1987). *Transfer of Learning*. San Diego, CA: Academic Press.

Cowan, N. (1999). An Embedded-process Model of Working Memory. In P. Shah, and A. Miyake (Eds.), *Models of Working Memory: Mechanisms of Active Maintenance and Executive Control* (pp. 62-101). New York: Cambridge University Press.

Cyert, R. M. and J. G. March. 1963/1992. *A Behavioral Theory of the Firm*. 2nd ed. Englewood Cliffs, NJ: Prentice Hall,.

Darr, E. P., Argote, L. and Epple, D. (1995). The Acquisition, Transfer and Depreciation of Knowledge in Service Organizations: Productivity in Franchises. *Management Science***,** 41(11), 1750-1762.

Datta, D. K., Pinches, G. E., and Narayanan, V. K. (1992). Factors Influencing Wealth Creation from Mergers and Acquisitions: A Meta-Analysis. *Strategic Management Journal*, 13(1): 67-84.

Davis, G.F., Diekmann, K.A. and Tinsley, C.H. (1994). The Decline and Fall of the Conglomerate Firm in the 1980s: A Study in the De-Institutionalization of an Organizational Form. *American Sociological Review*, 59: 547-570.

Deutsch, Y., Keil, T., and Laamanen, T. (2007). Decision Making in Acquisitions: The Effect of Outside Directors' Compensation on Acquisition Patterns. *Journal of Management*, 33(1): 30-56.

Dezhbakhsh, Hashem (1990). The Inappropriate use of Serial Correlation Tests in Dynamic Linear Models. *The Review of Economics and Statistics*, 72(1): 126 – 132.

DiMaggio, P.J. and Powell, W.W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, (48): 147 – 160.

Dubin R. (1978). *Theory Building* (Revised Edition). New York: The Free Press:.

Duncan, C. and Mtar, M. (2006). Determinants of International Acquisition Success: Lessons from FirstGroup in North America. *European Management Journal*, 24(6): 396-410.

Duncker, K. (1945). On Problem-Solving. *Psychological Monographs*, 58 (Whole No. 270).

Edlund, Per-Olov (1984). Identification of the Multi-input Box-Jenkins Transfer Function Model. *Journal of Forecasting*, 3:297 – 308.

Ellis, H. (1978). *Fundamentals of Human Learning, Memory and Cognition*, Dubuque, IA: Brown Company Publishers:.

Eriksson, M. and Sundgren, M. (2005). Managing Change: Strategy or Serendipity - Reflections from the Merger of Astra and Zeneca. *Journal of Change Management*, 5(1): 15-28.

Fama, Eugene F. (1998). Market Efficiency, Long-term Returns, and Behavioral Finance, *Journal of Financial Economics*, 49: 283-306.

Fama, E. F. and Fisher, L., Jensen, M. C., & Roll, R. (1969). The Adjustment of Stock Prices to New Information. *International Economic Review*, 10(1): 1.

Ferrier, Walter J. and Lyon, Douglas W. (2004). Competitive Repertoire Simplicity and Firm Performance: The Moderating Role of Top Management Team Heterogeneity. *Managerial and Decision Economics*, 25(6-7): 317 – 327.

Finkelstein, S. and Haleblian, J. (2002). Understanding Acquisition Performance: The Role of Transfer Effects. *Organization Science*, 13(1): 36-47.

Fiol, C.M. and Lyles, M.A. (1985). Organizational Learning, *Academy of Management Review*, 10: 803 – 813.

Foss, N. J. (2003). Bounded Rationality and Tacit Knowledge in the Organizational Capabilities Approach: an Assessment and a Re-evaluation. *Industrial and Corporate Change*, 12(2): 185-201.

Fowler, K. L. and Schmidt, D. R. (1988). Tender offers, Acquisition, and Subsequent Performance in Manufacturing Firms. *Academy of Management Journal*, 31(4): 962-974.

Gabrielsen, T.S. (2003). Conglomerate Mergers: Vertical Mergers in Disguise? *International Journal of the Economics of Business, Taylor and Francis Journals*, 10(1): 1-16.

Gersick, C.J.G. (1994). Pacing Strategic Change: The Case of a New Venture. *Academy of Management Journal*, 37: 9-45.

Gick, M. and Holyoak, K. (1987). The Cognitive Basis of Knowledge Transfer. in S. Cormier, J. Hagman (Eds.). *Transfer of Learning: Contemporary Research und Applications B2-Transfer of Learning: Contemporary Research und Applications*: 9-46. San Diego, CA: Academic Press.

Ginsberg A. and Baum J.A.C. (1998). *The value of learning by doing: acquisition experience and profitability*. New York University

Greenwald, B. and Kahn, J. (2005). *Competition Demystified: A Radically Simplified Approach to Business Strategy*. New York: Portfolio:.

Greeve, H.R. (2003). *Organizational Learning from Performance Feedback*. Cambridge University Press: New York.

Gulati, R. (1998). Alliances and Networks, *Strategic Management Journal*, 19: 293-317.

Gulati, R. (1999). Network Location and Learning: The Influence of Network Resources and Firm Capabilities on Alliance Formation. *Strategic Management Journal* 20(5): 397.

Haleblian, J. and Finkelstein, S. (1999). The Influence of Organizational Acquisition Experience on Acquisition Performance: A Behavioral Learning Perspective. *Administrative Science Quarterly*, 44(1): 29-56.

Haleblian, J., Ji-Yub, K., and Rajagopalan, N. (2006). The Influence of Acquisition Experience and Performance on Acquisition Behavior: Evidence from the U.S. Commercial Banking Industry. *Academy of Management Journal*, 49(2): 357-370.

Hamel G. (1991). Competition for Competence and Inter-partner Learning within International Strategic Alliances. *Strategic Management Journal*, 12: 83-103.

Hamel, G. and Prahalad, C.K. (1993). Strategy as Stretch and Leverage. *Harvard Business Review*, 71: 75-84.

Hansen, M. H., Perry, L. T., and Reese, C. S. (2004). A Bayesian Operationalization of the Resource-Based View. *Strategic Management Journal*, 25(13): 1279-1295.

Harrison J, Hitt M, Hoskisson R, Ireland R. (1991). Synergies and Post-acquisition Performance: Differences Versus Similarities in Resource Allocations. *Journal of Management*, 17: 173-190

Haspeslagh, P. C. and Jemison, D. B. (1991). Managing Acquisitions: Creating Value through Corporate Renewal. New York: Free Press.

Haunschild, Pamela R. (1993). Interorganizational Imitation: The Impact of Interlocks on Corporate Acquisition Activity. *Administrative Science Quarterly*, 38: 564-592.

Haunschild, P.R. and Beckman, C.M. (1998). When do Interlocks Matter? Alternate Sources of Information and Interlock Influence. *Administrative Science Quarterly*, 43(4): 815-844.

Haunschild, P.R., Davis-Blake, A. and Fichman, M. (1994). Managerial Over Commitment in Corporate Acquisition Processes. *Organization Science*, 5: 528-540.

Hayn, C. and Hughes, P. J. (2006). Leading Indicators of Goodwill Impairment. *Journal of Accounting, Auditing & Finance*, 21(3): 223-265.

Hayward, M.L.A. and Hambrick, D.C. (1997). Explaining the Premiums Paid for Large Acquisitions: Evidence of CEO Hubris. *Administrative Science Quarterly*, 42(1): 103-129.

Hayward, M.L.A. (2003). Professional Influence: The Effects of Investment Banks on Client's Acquisition Financing and Performance. *Strategic Management Journal*, 24(9): 783-801.

Healey, P.M., Krishna, G.P. and Ruback, R. (1992). Does Corporate Performance Improve after Mergers? *Journal of Financial Economics*, 31: 135-175.

Hébert, L., Very, P., and Beamish, P. W. (2005). Expatriation as a Bridge Over Troubled Water: A Knowledge-Based Perspective Applied to Cross-Border Acquisitions. *Organization Studies*, 26(10): 1455-1476.

Henderson, J. and Cool, K. (2003). Learning to Time Capacity Expansions: An Empirical Analysis of the Worldwide Pertochemical Industry, 1975-95. *Strategic Management Journal*, 24(5): 393.

Higgins, M. J. and Rodriguez, D. (2006). The Outsourcing of R&D Through acquisitions in the Pharmaceutical Industry. *Journal of Financial Economics*, 80(2): 351-383.

Hill, C.W.L. and Hoskisson, R.E. (1987). Strategy and Structure in the Multiproduct Firm. *Academy of Management Review*, 2: 331-341.

Hillmer, S.C., Larcker D.F. and Schroeder, D.A. (1983). Forecasting Accounting Data: A Multiple Time-series Analysis. *Journal of Forecasting*, 2: 389-404.

Hitt M.A., Hoskisson, R.E. and Kim H. (1997). International Diversification: Effects on Innovation and Firm Performance in Product-diversified Firms. *Academy of Management Journal*, 40(4): 767-799.

Hitt. M.A., Hoskisson, R.E., Johnson, R.A. and Moesel, D.D. (1996). The Market for Corporate Control and Firm Innovation. *Academy of Management Journal*, 39(5) 1084-1119.

Hitt, M.A., Ireland, R.D., Camp, S.M. and Sexton, D.L. (2001). Strategic Entrepreneurship: Entrepreneurial Strategies for Wealth Creation. *Strategic Management Journal*, 22(Special Issue): 479-491.

Holyoak, K.J. (1984). Analogical Thinking and Human Intelligence. In R.J. Sternberg (Ed.), *Advances in Psychology of Human Intelligence*, Vol. 2, (pp. 199-230). Hillsdale, NJ: Erlbaum.

Hopwood, W.S. and McKeown, J.C. (1981). An Evaluation of Univariate Time-Series Earnings Models and Their Generalization to a Single Input Transfer Function. *Journal of Accounting Research*, 19(2): 313-322.

Huber, G.P. (1991). Organizational Learning: The Contributing Processes and the Literatures. *Organization Science*, 2: 88-115.

Ingram, P. and Baum, J.A.C. (1997). Chain Affiliation and the Failure of Manhattan Hotels, 1898-1980. *Administrative Science Quarterly*, 42(1): 68-102.

Iyer, D.N. and Miller, K.D. (2008). Performance Feedback, Slack, and the Timing of Acquisitions. *Academy of Management Journal*, 51(4): 808-822.

Jemison, D. and Sitkin, S. (1986). Corporate Acquisitions: A Process Perspective. *Academy of Management Review*, 11: 145-163.

Jenkins, G.M. (1979). *Practical Experiences with Modeling and Forecasting Time Series*, St Helier, Jersey: G. Jenkins and Partners Ltd.

Jennings, R.H. and Mazzeo, M.A. (1991). Stock Price Movements around Acquisition Announcements and Management's Response. *Journal of Business*, 64: 139-163.

Jensen, M.C. and Ruback, R.S. (1983). The Market for Corporate Control. *Journal of Financial Economics*, 11(1-4): 5-50.

Jose, M., Nichols, L. and Stevens, J. Winter (1986). Contributions of Diversification, Promotion and R&D to the Value of Multiproduct Firms. *Financial Management*, 15(4): 33–42.

Jovanovic, B. and Rousseau, P.L. (2002). The *Q*-Theory of Mergers. *American Economic Association Papers and Proceedings*, 92(2): 198-204.

Kaplan, S.N. and Weisbach, M.S. (1992). The Success of Acquisitions: Evidence from Divestitures. *Journal of Finance*, 47(1): 107-138.

Kelley, H.H. (1971). *Attribution at Social Interaction*. New York: General Learning Press.

Kesner, I.F., Shapiro, D.L., and Sharma, A. (1994). Brokering Mergers: An Agency Theory Perspective on the Role of Representatives. *Academy of Management Journal*, 37(3): 703-721.

Kinney, William R., Jr. (1978). ARIMA and Regression in Analytic Review: an Empirical Test. *The Accounting Review*, 53(1): 48-60.

Kogut, B. (1988). Joint Ventures: Theoretical and Empirical Perspectives. *Strategic Management Journal*, 9(4): 319-332.

Kogut, B. and Zander, U. (1992). Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology. *Organization Science*, 3(3): 383-397.

Kogut, B. and Zander, U. (2003). Knowledge of the Firm and the Evolutionary Theory of the Multinational Corporation: 2003 Decade Award Winning Article. *Journal of International Business Studies*, 34(6): 516-529.

Lang, L.H.P., Stulz, R.M., and Walking, R.A. (1989). Managerial Performance, Tobin's *Q*, and the Gains from Successful Tender Offers. *Journal of Financial Economics*, 24: 137-154.

Larsson, R. and Finkelstein, S. (1999). Integrating Strategic, Organizational, and Human Resource Perspectives on Mergers and Acquisitions: A Case Survey of Synergy Realization. *Organization Science*, 10: 1-26.

Lee, H.D.P. (1939). The Aviary Simile in the Theaetetus. *The Classical Quarterly*, 33(3-4): 208-211.

Leonard-Barton, D. (1992). Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development. *Strategic Management Journal* (Summer Special Issue), 13: 111-125.

Levinthal, D.A. and March, J.G. (1981). A Model of Adaptive Organizational Search, *Journal of Economic Behavior and Organization*, 2: 307-333.

-- (1993). The Myopia of Learning. *Strategic Management Journal*, 14: 95-112.

Levitt, B. and March, J.G. (1988). Organizational Learning. *Annual Review of Sociology*, 14: 319-340.

Levy, H. and Sarnat, M. (1970). Diversification, Portfolio Analysis, and the Uneasy Case for Conglomerate Mergers. *Journal of Finance*, 25: 795-802.

Lindenberg, Eric B., and Ross, Stephen A. (1981). Tobin's *q* Ratio and Industrial Organization. *Journal of Business*, 54:1-32.

Loughran, T. and Vijh, A.M. (1997). Do Long-Term Shareholders Benefit From Corporate Acquisitions? *Journal of Finance*, 52(5): 1765-1790.

Lubatkin, M.H. (1982). A Market Model Analysis of Diversification Strategies and Administrative Experience on the Performance of Merging Firms (Unpublished Dissertation, University of Tennessee).

Malkiel, Burton G., von Furstenberg, George M. and Watson, Harry S. (1979). Expectations, Tobin's q, and Industry Investment. *Journal of Finance*, 34(2): 549-61.

March, J. G. and Olsen, Johan, P. (1975). The Uncertainty of the Past: Organizational Learning Under Ambiguity. *European Journal of Political Research*, 3: 147-171.

Martin, X. and Salomon, R. (2003). Tacitness, Learning, and International Expansion: A Study of Foreign Direct Investment in a Knowledge-Intensive Industry. 14(3): 297-311.

Mascarenhas, B., Kumaraswamy, A., Day, D. and Baveja, A., (2002). Five Strategies for Rapid Firm Growth and how to Implement Them. *Managerial and Decision Economics*, 23(4,5) 317-330..

McCardle, K.F. and Viswanathan, S. (1994). The Direct Entry Versus Takeover Decision and Stock Price Performance Around Takeovers. *Journal of Business*, 67(1): 1-43.

McConnell, John J. and Servaes, Henri, (1990). Additional Evidence on Equity Ownership and Corporate Value. *Journal of Financial Economics*, 27(2): 595-612.

McGrath, R.G. (2001). Exploratory Learning, Innovation Capacity, and Managerial Oversight. *Academy of Management Journal*, 44: 118-131.

McNamara, G.M., Haleblian, J. and Dykes BJ. (2008). The Performance Implications of Participating in an Acquisition Wave: Early Mover Advantages, Bandwagon Effects, and the Moderating Influence of Industry Characteristics and Acquirer Tactics. *Academy of Management Journal*, 51(1): 113-130.

Minutolo, M.C. (2008). Revisiting When Firms Learn from their Acquisition Experience: Evidence From 1996-2006. *Regional Business Review*. 27.

Morck, R., Shleifer, A. and Vishny, R.W. (1990). Do Managerial Objectives Drive Bad Acquisitions? *Journal of Finance*, 45: 31-48.

Nelson, R.R. and Winter, S.G. (1982). *An Evolutionary Theory of Economic Change*. Cambridge, MA: Belknap Press.

Novick, L.R. (1988). Analogical Transfer, Problem Similarity, and Expertise. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 14: 510-520.

Oliver C. (1990). Determinants of Interorganizational Relationships: Integration and Future Directions. *Academy of Management Review*, 15(2): 241-265.

Pablo, A.L., Sitkin, S.B., and Jemison, D.B. (1996). Acquisition Decision-Making Processes: The Central Role of Risk. *Journal of Management*, 22(5): 723.

Pack, D.J. (1977). Revealing Time Series Interrelationships. *Decision Sciences*, 8: 377-402.

Palmer, D. and Barber, B.M. (2001).Challengers, Elites, and Owning Families: A Social Class Theory of Corporate Acquisitions in the 1960s. *Administrative Science Quarterly*, 46(1): 87-120.

Pennings, J.M., Barkema, H.G. and Douma, S. (1997). Organizational Learning and Diversification. *Academy of Management Journal*, 37: 608-627.

Penrose, E.T. (1959). *The Theory of the Growth of the Firm*. New York, NY: Wiley.

Pfeffer J., (1972). Merger as a Response to Organizational Interdependence. *Administrative Science Quarterly*, 17: 382-394.

Podolny, J. and Page, K. (1998). Network forms of Organization. *Annual Review of Sociology*, 24: 57-76.

Porrini, P. (2004). Alliance Experience and Value Creation in High-Tech and Low-Tech Acquisitions. *Journal of High Technology Management Research*, 15(2): 267.

Porrini, P. (2006). Are Investment Bankers good for Acquisition Premiums? *Journal of Business Research*, 59(1): 90-99.

Porter M.E. (1985). *Competitive Advantage*, New York: Free Press.

Porter, M.E. (1987). From Competitive Advantage to Corporate Strategy. *Harvard Business Review*, 65(3): 43-59.

Powell, W. (1990). Neither Market nor Hierarchy: Network Forms of Organization. In *Research in Organizational Behaviour*, Vol. 12, Staw, B. and Cummings, L. (eds), Greenwich, CT: JAI Press.

Ragozzino, R. (2006). Firm Valuation Effects of High-Tech M&A: A Comparison of New Ventures and Established Firms. *Journal of High Technology Management Research*, 17(1): 85-96.

Ravenscraft, D.J. and Scherer, F.M. (1987). „Life after Takeover. *Journal of Industrial Economics*, 36(2): 147-156.

Rumelt, R.P. (1986). *Strategy, Structure, and Economic Performance* (Revised Edition ed.). Boston, Mass: Harvard Business School Press.

Sanders, K. (2001). Merging Two Companies. *Strategic Finance*, 83(6): 63.

Scherer, F.M., Ross, D. (1990). *Industrial Market Structure and Economic Performance*. Boston, MA: Houghton Mifflin.

Schoenberg, R. (2006). Measuring the Performance of Corporate Acquisitions: An Empirical Comparison of Alternative Metrics. *British Journal of Management*, 17(4): 361-370.

Schweiger DM, Goulet PK. (2000). Integrating Mergers and Acquisitions: An International Research Review. In C Cooper, A Gregory (Eds.). *Advances in Mergers and Acquisitions*, Vol. 1: (pp. 61-91). New York: Elsevier Science, Inc.

Shayne, Gary M. (2005). Implementation Strategy and Performance Outcomes in Related Diversification. *Strategic Management Journal*, 26(7): 643-664.

Smirlock, Michael, Gilligan, T. and Marshall, William (1984). Tobin's q and the Structure-Performance Relationship. *American Economic Review*, 74: 1051-60.

Smith, Clifford Jr. and Watts, Ross L. (1992). The Investment Opportunity set and Corporate Financing, Dividend, and Compensation Policies. *Journal of Financial Economics*, 32(3): 263-292.

Sorenson, O. (2003). Interdependence and Adaptability: Organizational Learning and the Long-Term Effect of Integration. *Management Science*, 49(4): 446-463.

Szulanski, G. (1999). *Appropriability and the Challenge of Scope: BancOne Routinizes Replication*. Wharton School, University of Pennsylvania.

Tan, D. (2003). The Limits to the Growth of Multinational Firms in a Foreign Market. *Managerial & Decision Economics*, 24(8): 569-582.

Teece D. (1980). Economies of Scope and the Scope of the Enterprise. *Journal of Economic Behavior and Organization*, 1(3): 223-247.

Teece D. (1982). Toward an Economic Theory of the Multiproduct Firm. *Journal of Economic Behavior and Organization*, 3: 39-63.

Teece D.J., Pisano G. and Shuen A., (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18(7): 509-533.

Teece, D.J., Rumelt, R., Dosi, G. and Winter, S. (1994). Understanding Corporate Coherence: Theory and Evidence. *Journal of Economic Behavior and Organization*, 23: 1-30.

Thurstone, L. (1919). The Learning Curve Equation. *Psychology Monographs*, 26: 114.

Tobin, James (1976). Hansen and Public Policy. *The Quarterly Journal of Economics*, 90(1): 32-37

Tobin, James and Brainard, William C. (1976). Asset Markets and the Cost of Capital. *Cowles Foundation Discussion Papers* 427, Cowles Foundation, Yale University

U.S. Bankcorp (2007). *2007 Annual Report*: 126. U.S. Bancorp: Minneapolis, MN. Available electronically at: http://www.usbank.com/about/investor/pdf/USBancorp_Annual_Report_2007.pdf

Vermeulen F, Barkema H. (2001). Learning through Acquisitions. *Academy of Management Journal*, 44: 457-476

Villalonga, B.N. and McGahan, A.M. (2005). The Choice Among Acquisitions, Alliances, and Divestitures. *Strategic Management Journal*, 26(13): 1183-1208.

Warner, A.G. (2003). Buying Versus Building Competence: Acquisition Patterns in the Information and Telecommunications Industry 1995-2000 *International Journal of Innovation Management*, 7(4): 395-415.

Weick, K.E. (1979). The Social Psychology of Organizing (2d ed. ed.). Reading, Mass: Addison-Wesley Publishing Co.

Whyte, G. (1986). Escalating Commitment to a Course of Action: A Reinterpretation. *Academy of Management Review*, 11(Issue 2): 311.

Willet, J.B. and Sayer, A.G. (1994). Using Covariance Structure Analysis to Detect Correlates and Predictors of Individual Change over Time. *Quantitative Methods in Psychology*, 116(2): 363-381.

Williamson O.E., (1975). *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: Free Press.

Williamson O.E., (1985). *The Economic Institution of Capitalism*. New York: Free Press.

Williamson O.E., (1991). Comparative Economic Organization: The Analysis of Discrete Structural Alternatives. *Administrative Science Quarterly*, 36: 269-296.

Winter, S. and Szulanski, G. (1998). *Replication as Strategy*. Working Paper, The Wharton School, University of Pennsylvania.

Wright, T. (1936). Factors Affecting the Cost of Airplanes. *Journal of Aeronautical Sciences* 3: 122-128.

Zollo, M. and Singh, H. (2004). Deliberate Learning in Corporate Acquisitions: Post-Acquisition Strategies and Integration Capability in U.S. Bank Mergers. *Strategic Management Journal*, 25(13): 1233-1256.