DISSERTATION

THE IMPACT OF MANAGERIAL DECISION PROCESSES ON SHAREHOLDER VALUE: AN EVENT STUDY ANALYSIS

Submitted by

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WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY JESSICA CONSER ENTITLED THE IMPACT OF MANAGERIAL DECISION PROCESSES ON SHAREHOLDER VALUE: AN EVENT STUDY ANALYSIS BE ACCEPTED AS FULFILLING IN PART THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

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ABSTRACT OF DISSERTATION

THE IMPACT OF MANAGERIAL DECISION PROCESSES ON SHAREHOLDER VALUE: AN EVENT STUDY ANALYSIS

The purpose of this event study is to investigate the relationship between managerial decision making processes and shareholder value. The literature review explores the convergence of two disciplines, cognitive psychology and corporate finance stemming from the integration of prior event studies.

The research employs a traditional event study methodology to examine the impact on shareholder wealth when companies announce the adoption of the proprietary decision making tool offered by Kepner Tregoe (KT), an international consulting firm in the northeastern United States. When companies adopt the decision making tool they are announced on the KT website as a client. This study considers all such announcements for publicly traded companies between the dates of 1994 and 2005, conditional upon the availability of stock price data from the Center for Research and Security Prices (CRSP). The final sample consists of 49 companies from the following industries: consumer and manufacturing; electric, telecom, and information technologies; energy; pharmaceutical; and other.

To measure the amount of shareholder value added as a result of the market's reaction to announcement of the implementation of the decision making processes, the cumulative average abnormal returns (CAAR) are calculated for each event date. The overall CAAR is .52% for entire sample and is statistically significant at the .001 level. Industry partition results indicate positive CAARs ranging from .34% to 1.56%. The pharmaceutical partition has the lowest CAAR of .34% with statistical significance at the

.05 level. The next CAAR at .59% occurred in the 'other' data partition with statistical significance at the .01 level. The consumer and manufacturing partition yields a CAAR of 1.17% two days before the event and is statistically significant at the .05 level. The electric, telecom, and information technology partition has a CAAR of 1.39% and statistically significance at the .01 level. The highest CAAR of 1.56% occurs in the energy partition with statistical significance at the .10 level.

Descriptive statistics further explain the data using available financial data: outstanding debt, return on equity, return on assets, and price/earning ratios. There are 18 companies with available descriptive financial data. Of these companies, the median debt level is $5,704.80. The median return on equity (ROE) is 13.80, return on assets (ROA) 4.05, and price/earnings (P/E) 19.40.

The conclusions drawn from this research indicate that there is a favorable reaction by shareholders when companies announce the adoption of the proprietary decision making process. The shareholders are privy to any detailed information about the specific decisions being made, but just that the decision process is being used. The market perceived a quantifiable value of a particular kind of decision making process. The market assumes that the adoption is going to improve the future cash flow of the companies. Future research may seek to explore the specific decisions that are made using proprietary decision making tools.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I – INTRODUCTION

The purpose of this chapter is to provide a background for the issue that was addressed by this research. This chapter contains the following sections with focus on the following areas, (a) statement of the research problem, (b) Purpose of the research, (c) research questions, (d) definitions of terms, (e) delimitations and limitations, (f) researcher's perspective.

Background

Financial metrics, which measure performance, guide decision making, and gauge whether shareholder value is created, are being used more today than at any other time in recent corporate history. But of all the fashionable value calculations, the biggest determinant of total return to shareholders is still meeting, beating, or missing what the stock market expects a company to earn (Copeland, 2002). Throughout history corporate decisions have been made on the basis of *some* information, through *some* process, or often times a lack thereof. Accounts of good and bad decisions are abundant. Often times people are presented with information, and then they are faced with the task of analyzing it to make the best decision. Sometimes their decision is to ignore the information they have received, other times it is to act upon it impetuously. When this happens, severe economic and political implications can unveil.

Given the state of the current economic environment, there is clearly a need for greater transparency in corporate decision making. If managers had a way of making their thinking visible, decisions would be more efficient. While this may not have prevented

corporate failures, it would have required more input and information, thus increasing awareness surrounding the decisions while also creating a paper trail to increase accountability and transparency.

A recent initiative at Foremost Farms USA provides evidence for the importance of clearly defined and well communicated decision making processes. When employees were asked to change their process of making 640-lb. blocks of American-style cheese, they slowly began reducing the amount of variation that typically ranged from 30 to 40 pounds. However without further explanation from management, employees resorted to their old ways of making cheese. Based upon a lack of clear rationale, the workers felt more comfortable with the former processes. A common managerial dilemma involved in decision making is how to communicate directives in a manner that workers will follow (Dvorak, 2007). In many cases following the directives is not enough, management often needs to find new ways of making changes stick. According to Dvorak (2007) when employees are involved in the decision making process, they are more likely to get on board and support the decision.

Employees often feel more committed to a decision if they are told what, how, and why a decision was made. Foremost Farms USA realized a different approach was necessary to create lasting change. They began holding meetings throughout the company that explained to the workers why the processes had changed and what alternatives were considered. Employees seemed receptive to management's efforts and asked for more of such meetings. One organizational survey looked at 300 managers and employees from various organizations and reported that when decisions were more fully explained to the employees, the employees were twice as likely to support those decisions than firms

whose decision making was less explicit (Dvorak, 2007). Reasons as to why employees fail to receive adequate information may occur when managers:

1. Feel too busy to explain their thinking.
2. Become so wrapped-up in the decision making process that they think their conclusions are obvious.
3. Do not want to disclose sensitive information or arguments that could potentially undermine their decision (Dvorak, 2007).

When employees understand why and how decisions are made they are more likely to be supportive of them, and the same is true for analysts. If analysts are able to determine that managers are using more efficient and effective decision making processes, they can make better predictions and recommendations about the future value of the firm.

Statement of the Research Problem

Managerial decision making processes can affect shareholder value in both positive and negative ways. There is debate regarding how financial value is created through strategic endeavors and how it should be measured (Srivastava, Shervani, & Fahey, 1999). The caliber of decisions managers make and, more importantly, the ways in which decisions are formulated and measured are fundamental to enhancing shareholder value. Shareholders value is based upon sound decision making by managers. However, managers often lose sight of decisions that can positively affect shareholder value in the long run. In addition to decision efficiency gain this study conjectures that the adoption of the decision making process could mitigate some agency costs associated with poor decisions.

A study conducted at the University of Washington found that 59% of managers said they would forego a good investment decision if it meant missing quarterly earnings (Samuelson & Preisser, 2006). When managers act in their best interest and forego a good investment opportunity, it is considered to be an agency problem. For example, Akerlof, (1970); Campbell, (1979); and Myers & Majluf, (1984) studied how a disproportionate level of information asymmetry between managers and investors can affect the market value. Agency problems such as these could potentially be mitigated by having a transparent infrastructure of accountability. Even though shareholder value assessments may be discouraged by some researchers due to possible difficulty in determining the value of future cash flows, the concept has been widely accepted and used by the financial field, as will be demonstrated in the following chapters. Various metrics have been used to assess shareholder value such as (a) comparing the historical stock price of a firm relative to the market (Mahajan & Lummer, 1993; Finger, 2000), (b) return on assets (Nelson & Winters, 1982), and (c) economic value added (Stewart, Ellis, & Budington, 2002).

A conceptual framework (see Figure 1) guides this study using the variables being explored and the research goals. This study seeks to identify a relationship between variables more commonly studied in cognitive psychology and corporate finance (decision making and shareholder value, respectively). The assumption is that a positive relationship exists between the adopters of the proprietary decision making processes stemming from the cognitive psychology realm and shareholder value stemming from the field of corporate finance.

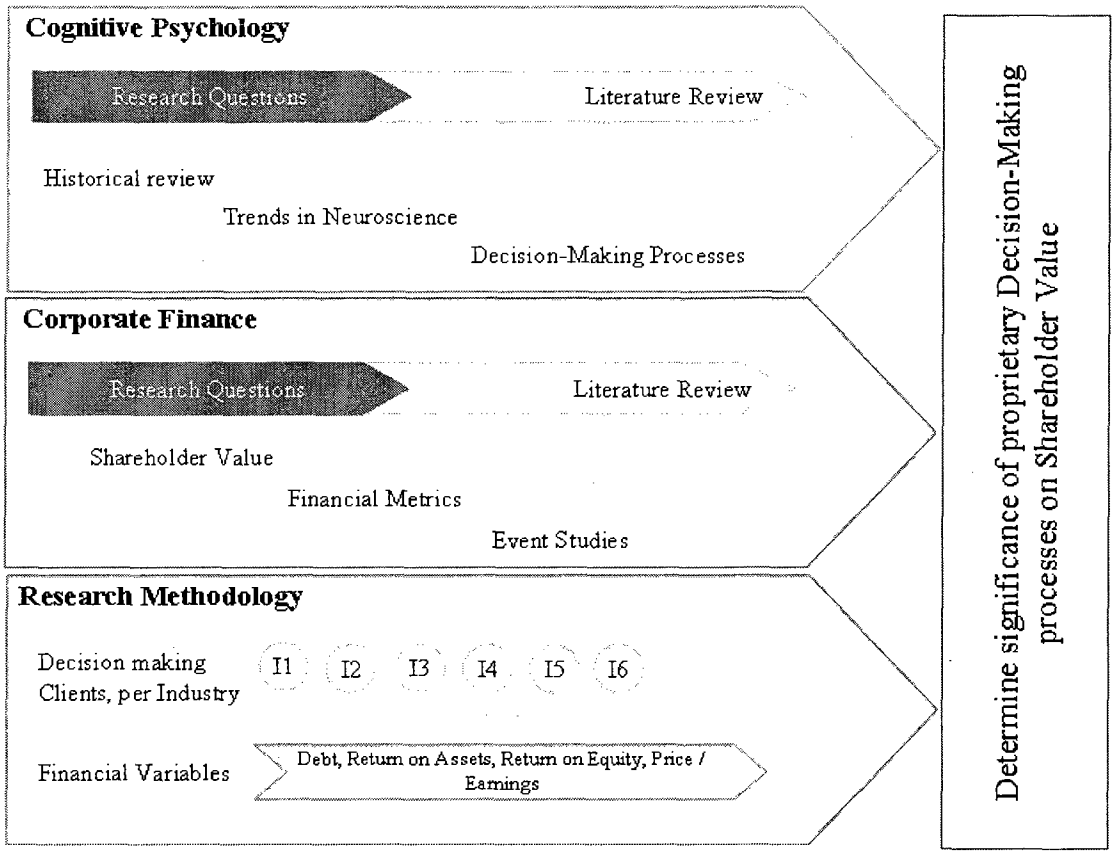

Figure 1. Conceptual Framework for Research. This figure illustrates the factors assessed in this dissertation including cognitive psychology, corporate finance, and the research methodology.

Purpose of Research

A preliminary review of the literature indicates there is a strong need for research in the combined areas of decision making and shareholder value. The interconnectedness of cognitive psychology and corporate finance remain relatively unexplored. The purpose of this research is to explore proprietary decision making processes relative to the historical stock prices of the decision making clients. Therefore the purpose of this study is to bridge the gap between cognitive psychology and corporate finance.

Prior works within cognitive psychology and neuroscience are reviewed to uncover current trends within decision making. Additionally various studies relating to

corporate finance and event study methodologies are highlighted to support the present research structure. By combining these disciplines, analysts have another way of identifying companies that add shareholder value through the adoption of proprietary decision making tools. While the breadth and depth of the tools' usage are not often known, analysts are able to determine which companies have, to some extent, begun utilizing the tool. Due to the quantitative style of the proprietary decision making tool, industries with clearly identifiable processes are expected to yield higher returns. For example, manufacturing companies lend themselves to tangible, measurable, and controllable processes compared to service-oriented companies with unclear processes and non-measurable goods. Companies that have adopted the decision making processes become publicly known when they are posted to the proprietary consulting firm's website and thus this action will be considered the event date.

Corporate event studies are natural experiments that evaluate the impact of an event on a firm's market value using expected stock returns as a benchmark. The event (e.g., a company decision) contains new information, which is then integrated into the stock price by investors (Hanvanich, 2002). The stock price response reflects investors' perception of the new information or decision. Event studies have been used to assess various effects of various organizational changes. Table 1 represents a few of the areas in which event studies have been used.

Table 1

Selected Event Studies

Event Studied	Author(s)
Dividend initiation	Healy & Palepu (1988)
Stock splits	Fama, Fisher, Jensen, & Roll (1969); Asquith, Healy, & Palepu (1989)
Managerial buyouts	Kaplan (1989)
Season equity offerings	Healy & Palepu (1990)
Repurchases	Dann, Masulis, & Mayers (1991)
Securitization announcement	Gasbarro, Stevenson, Schwebach, & Zumwalt (2005)
Reverse leveraged buyout	DeGoerge & Zeckhauser (1993); Holthausen & Larcker (1996)
Management changes	Mahajan & Lummer (1993)
Initial public offerings	Mikkelson & Shah (1997)
Mergers / takeovers	Healy, Palepu, & Ruback (1992)
Bond rating changes	Abad-Romero & Robles-Fernandez (2006)
Joint venture announcements	Hanvanich, Richards, Miller, & Cavusgil (2005); Hanvanich (2002); Reuer & Koza (2000)

Note. This table offers a sample of recent event studies, it is not indicative of all corporate variables.

The breadth of the topics covered in these studies indicate that there has been substantial work in analyzing stock price performance with regard to corporate events, and thus support the use of an event study methodology for this research. In addition to measuring abnormal returns we also analyzed industry effects by conducting a residual regression using industry dummy variables. Additionally financial metrics such as debt, return on assets (ROA), return on equity (ROE), and price/earnings ratios are presented to further explain the data.

Often in scientific and professional studies, researchers protect confidential information concerning persons, groups, or organizations so that they are not individually identifiable. In adhering to these ethical practices the individual names of the

organizations involved in this study are not disclosed. Rather, the KT clients are considered the adopting clients and are referenced on an industry level. A further description of the sample is discussed in Chapter III.

Research Questions

The aims of this research are reflected in the following exploratory questions. These questions serve as a guide for the data collection and analyses and are discussed in greater detail in Chapter V.

1. What is the relationship between managerial decision making and shareholder value?
2. What are the implications of decision making approaches on the overall value of the firm?
3. What can be attributed to the differences/similarities across industries with regards to abnormal stock price returns?
4. How does the market perceive whether or not managers make good decisions?

A positive reaction by the market, if indicated by an abnormal return, could suggest that the market perceives the decision making approaches are in the best interest of the shareholders. Therefore, managers are making clear, well-informed decisions regarding the resources of the firm. A negative abnormal return implies that shareholders perceive this particular decision method to be an inefficient use of company resources. In this case companies may then seek to adopt alternative decision making approaches to guide future investment decisions.

Definition of Terms

The terms below are used throughout this dissertation, and thus their definitions as they relate to this study are provided.

Abnormal Returns (ARs): occur when the actual return of an asset or security exceeds the expected rate of return.

Cumulative Abnormal Returns (CAR): refers to cumulative abnormal return summed over a multi-day time period known as an event window.

Cumulative Average Abnormal Returns (CAARs): refers to the average CAR across multiple companies.

Decision making Processes: a structured process of sequential thinking formulated by a series of questions, with the intention of retrieving, organizing, and analyzing information.

Event Studies: "natural experiments that assess the impact of an event on a firm's market value using expected stock price returns as a benchmark" (Hanvanich, 2002, p. 20).

Kepner Tregoe (KT): the organization whose proprietary decision making tools and clients are used in this study.

Shareholder Value (SHV): "Shareholder value is created by a business process and is based upon the net present value of future projected cash flows" (Hanvanich, 2002, p. 19).

Limitations and Delimitations

This study is based upon proprietary decision making processes developed by Kepner Tregoe, a consulting firm in the northeastern United States. The specific decision making processes are selected due to the researcher's connection to the consulting firm through an international graduate studies program. Due to the unique questions and format of the decision making tool, the implications of this study have limited generalizability to other managerial decision making processes. There is also the possibility that the information pertaining to the implementation could have been released in a subjective manner beyond the researcher's control. For example if people within the company were aware of the implementation date ahead of time and leaked the information it could have affected the stock price. An objective event study methodology is used to address these limitations.

Researcher's Perspective

As a child, I began noticing that people made decisions differently. For example, I would often obtain different answers from my parents for the same question, based upon the same information. Clearly the process by which these decisions were made must have been different. Once I started working, I noticed that there were several ways in which decisions could be made. Some people like to make quick decisions, almost relying more on instinct rather than information. Other people preferred to take their time, gather all relevant information, analyze it, and then make a decision. Both ways are neither right nor wrong. However, when organizations are filled with people who make decisions with limited information, it is difficult to understand why the decisions were made. Leaders are tasked with not only making decisions but establishing a vision for their direct

reports. It was some time before I understood how this process of leading and decision making were linked.

During my undergraduate studies in psychology, I took a neuroanatomy class where we examined how decisions were made within the brain. The scope of this focus was extended by my International MBA at CIMBA in Italy. During my graduate studies I further studied neurological decision making processes. Neuroscientists came and spoke to us regarding decision making and its relationship to organizational processes. A linkage occurred to me between the neuroimaging slides and quantifiably being able to measure organizational performance. It was at that point that I decided to conduct an empirical study relating to both rational decision making processes and firm performance. Not only did this draw upon my interest in how decisions can be made, but it also tied in my interests in business finance. At the end of the day, I was hoping to identify a way by which leaders could quantify the value of their decisions. In doing so I wanted to investigate if the type of decision process used was recognized or "priced" by the market as a measure of shareholder response to the companies' actions.

CHAPTER II – LITERATURE REVIEW

This study is about the convergence of two disciplines: cognitive psychology and corporate finance. Throughout history, these disciplines have developed theories and practices that are well known and used across numerous disciplines relevant to this study. From a cognitive psychology perspective, neuroscientific advances have led to the discovery of decision making processes at the neuron level within the brain. While on the corporate finance side, economic decisioning models have become extremely robust and sophisticated from a quantitative standpoint. This study explores how advances in cognitive psychology, particularly decision making, have financial implications for organizations with regard to their shareholder value. To support the convergence of two disciplines, the literature review is guided by Figure 1 in Chapter 1.

Introduction

Within the cognitive psychology and corporate finance literature decision making and shareholder value are independently reviewed. Additionally, research utilizing event-study methodologies are drawn upon to support this dissertation. The research in this study examines different industries in an attempt to create a broader perspective. A search was conducted across various research databases to determine the prevalence of decision making, shareholder value, and event studies. Independent and combined titles were searched, and yielded surprising results (refer to Table 2). Of the thousands of studies pertaining to decision making, shareholder value, and event studies, not a single study containing all three of these variables was found. This study is unique in nature,

therefore, due to a lack of identifiable empirical research surrounding these combined variables.

Table 2

Overview of Literature Findings

Search Terms/Source	Results
Decision Making:	
Business Source Premier	52,372
Thomson Gale	27,636
Decision Making and Shareholder Value:	
EBSCO Research Databases	60
Business Source Premier	155
Digital Dissertations	8
Decision Making and Event Study:	
Digital Dissertations	9
Managerial Decision Making:	
EBSCO Research Databases	497
Thomson Gale	277
Digital Dissertations	1,050
Shareholder Value:	
Business Source Premier	6,146
EBSCO Research Databases	2,639
Digital Dissertations	102
Shareholder Value and Event Study:	
Business Source Premier	68
Digital Dissertations	7
Event Study:	
Business Source Premier	9,633
Digital Dissertations	616
Shareholder Value and Decision Making and Event Study	0

Note. This table displays the number of available studies pertaining to decision making, shareholder value, and event study methodologies among various research databases. No effort was made to eliminate redundancies.

Table 2 suggests a need for more empirical research among the combined disciplines. Independently, decision making, shareholder value, and event study topics are reviewed to further understand the rationale for this study. The overarching topics serve to provide context and structure to support the relationships being explored.

Cognitive Psychology

Cognitive psychology involves all processes by which sensory inputs are transformed, reduced, elaborated, stored, recovered, and used (Neisser, 1967). It is concerned with these processes even when they operate in the absence of relevant stimulation, as in images and hallucinations (Neisser, 1967). As early as 460 B.C. Hippocrates believed the brain was involved with sensation and was the seat of intelligence. Around 387 B.C. Plato began teaching that the brain was the seat of mental processes. Fifty years later Aristotle contradicted these beliefs and reported that the heart was in fact the seat of human mental processes (Finger, 2000).

This contradiction led to several centuries of debate and exploration of the human body. The first known surgical intrusion into the base of the brain was conducted by Constanzo Varolio in 1573 (Finger, 2000). Throughout the 16th and 17th Centuries, researchers began identifying brain structures such as the optic nerves, hippocampus, white matter, cortex, as well as various brain diseases such as meningitis and strokes. The quest for a deeper understanding of brain functioning continued well into the 19th Century. As advances were made, cortical regions were identified and named and studies relating to neuron structure were published (Brazier, 1988; Finger, 2000; Marshall & Magoun, 1998; Martensen, 2004). While its roots date back over 2,000 years, cognitive psychology was not recognized as a formal science until 1967 when Ulric Neisser published *Cognitive Psychology*.

Recent research has begun to explain how decisions are made within the brain. Various regions of the brain have been studied in the context of decision making and researchers agree one of the most prevalent regions responsible for housing decision

making is the PFC or Pre-frontal Cortex. Within this region of the brain, neurons have been traced firing their synaptic activity throughout various types of decisions, such as choice preference. These decision making processes and others will be discussed in further detail in the next section.

Decision Making Processes

Various decision making processes seek to capitalize on the thinking ability of the human capital within the firm on a continual basis. Some of the processes provide organized ways of applying critical thinking skills to business concerns and are considered explicit in nature. Many approaches yield decisions that have long-lasting impacts. Even though bad decisions can occasionally stem from bad information, bad decisions can also occur from poor decision making processes (Hammond, Keeney, & Raiffa, 1998). The actual process of how decisions are made has been studied across various fields, from economics to psychology, and produced numerous theories.

As early as the 19th Century, economists determined that rational behavior played a role in decision making. E. Roy Weintraub noted that neoclassical economics was founded on three assumptions (a) individuals have rational preferences among outcomes that can be attributable to a value; (b) individuals strive to maximize their utility, while organizations seek to maximize their profits; and (c) people act independently on the basis of full and relevant information (Weintraub, 1954).

By the early 20th Century, neoclassical economics had taken a different direction toward industrial organization. Concepts such as imperfect competition, market forms, the marginal revenue curve, and ordinal utility began to emerge. As the shift toward industrial organization took hold, acclaimed economics and Nobel Memorial Prize

winner, Herbert Simon, emerged as a major contributor in the field. He is most notably known for his work surrounding decision making within organizations, which he referred to as Bound Rationality. Simon contends individuals face uncertainty about the future and costs in acquiring information in the present and are forced to make decisions not by maximization, but by satisficing; individuals are bounded by the confines of the present and seek to make a decision that is "good enough" rather than perfect (Simon, 1957).

Earlier notions stating rational managers had "perfect" information, knew all relevant criteria, had clearly defined problems, did not change their preferences, and did not have any resource constraints were challenged. Present assumptions state rational managers make decisions that are (a) consistent and (b) value-maximizing with known constraints. The constraints may stem from individual differences, decision bias, heuristics, internal and external organizational factors, or psychological types (Jones, George, & Hill, 2001).

Psychological types are being further explored within the fields of neuroscience and cognitive psychology to better understand decision-makers' heuristics and biases, many of which occur below the level of conscious awareness (Bazerman, 2005; Simon, 1987; Plous, 1993). Since the underpinnings of the decision making tool assessed in this dissertation are based in part upon neuroscientific research dating back over 50 years, it is important to review the current trends in this field.

Neuroscience provides evidence based "hard" science that assists researchers in developing skills traditionally considered "soft" skills" such as decision making (Ringleb & Rock, 2008). As a "soft" science, decision making has been assessed based upon decision making models and approaches, with limited empirical research as a "hard"

science. The field of neuroscience is expansive and continually growing with over 50,000 scientists globally. The major areas of neuroscience that pertain to decision making include:

- Integrative neuroscience
- Neurobiology
- Neurophysiology
- Social cognitive neuroscience

Most relevant to this dissertation is the social cognitive neuroscience field, which has a vast array of topics being explored including:

- Emotion regulation
- Self-awareness
- Social connection
- Decision making (Ringleb & Rock, 2008)

A prevalent tool used to explore these subject areas is the fMRI or Functional Magnetic Resonance Imaging. Through the use of this tool researchers are able to identify areas of the brain involved in decision making by tracking where the brain "lights up" when engaged in various decision making processes. Typical fMRI experiments measure brain activity in response to videos that engage participants in decision making choices. A benefit of this tool is that researchers are able to assess the mental processes in which a participant's brain is engaged from looking at the activity of the brain as opposed to asking the participant to explain how they feel or infer a mental state based upon behavioral cues.

A good example of a decision making study using fMRI was conducted by Gonzales, Dana, Koshino, and Just (2005). In this study participants were asked to choose between positive and negative choices based upon the following scenario:

> "Imagine that the United States is preparing for an outbreak of an unusual Asian disease that is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Scientific estimates of the consequences of the programs are as follow:
>
> *Positive Frame*:
> If Program A is adopted, exactly 200 people will be saved.
> If Program B is adopted, there is a 1 in 3 probability that all 600 people will be saved and a 2 in 3 probability that all 600 will die.
>
> *Negative Frame*:
> If Program C is adopted, exactly 400 people will die.
> If Program D is adopted, there is a 1 in 3 probability that nobody will die and a 2 in 3 probability that all 600 will die" (Gonzales et al., 2005, p. 2).

Participants consisted of 5 female and 10 male college students from the University of Pittsburgh. During the fMRI the participants were given 20 problems to solve based upon the positive and negative frames and the level of risk involved in the decision outcome. The majority of participants chose Programs A and D even though they are contradictory choices. Based upon the results of the fMRI, risky choices led to higher levels of brain activity in the Dorsolateral Prefrontal Cortex (DLPFC). The researchers concluded that people tended to be risk seeking when they were confronted with negatively framed problems and risk averse when presented with positively framed problems (Gonzales et al., 2005). This study is helpful in providing a link back to the KT approach which assesses decision making risk in their proprietary process. The fMRI is also valuable in instances where participants may not want to reveal their mental state or are unable to communicate their mental states such as in animal studies. An example of the latter scenario includes a decision making study involving Macaque monkeys.

Researchers at the Harvard Medical School have determined that assigning values to different options or alternatives, are forms of decision choices. The values are often transitive for choices that are invariant. The neurons may be responsible for the transitivity. Transitivity infers a preference of A to B and B to C yields a preference of A to C. For example, if a person prefers Apples to Bananas and Bananas to Coconuts, then they should also prefer Apples to Coconuts. The neural evidence of transitivity was recorded in Macaque monkeys in regard to their preference of varying quantities of apple juice to grape juice.

The amount of neuron firing activity in the frontal cortex was consistent among the choices; indicating that the choices were equally valued by the monkeys. As a result, this study provided key insights into the biology of frontal lobes (Kneller, 2007). Figure 2 represents the areas of the brain that numerous researchers have agreed are responsible for decision making; these areas are known as the Prefrontal Cortex (PFC), Ventromedial Cortex (VMC), Ventrolatteral Cortex (VLC), and the Dorsal hippocampus (dHPC) and have been shown to play a supportive role in choice or preferential decision making in humans (Kneller, 2007).

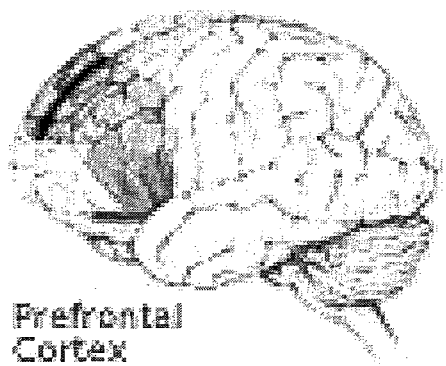

Figure 2. PFC. This figure shows the areas of the brain known to be involved in the decision making process.

According to Fellows (2004) decision making involves the synthesis of various types of information including multimodal sensory inputs, autonomic and emotional responses, past associations, and future goals. Sensory inputs must be integrated with information about uncertainty and risk, timing, and cost-benefit and then applied to select appropriate actions. Despite these daunting complexities, researchers have begun using a variety of methods to identify the component processes of decision making within the brain. (Dombrowski, Hilgetag, & Barbas, 2001; Ongur, An, & Price, 1998; Petrides & Pandya, 1999).

The use of advanced research tools within cognitive neuroscience is beginning to explore the decision making functions within the frontal area of the brain. Specific distinctions of the PFC regions were studied extensively by Chiavaras, LeGoualher, Evans, & Petrides (2001) when they investigated the sulci of 100 normal adult human brains and clearly identified four areas, including the olfactory, medial, lateral, and transverse orbital sulci. Further studies have explored the connectivity between the PFC areas in both human and primates (Dombrowski, Hilgetag, & Barbas, 2001; Petrides & Pandya, 1999).

The studies above revealed that the PFC areas have different patterns of connectivity and cytoarchitecture and are strongly interconnected. For example, the amygdala plays a major role in decision making through its interconnectedness with the Orbitfrontal Cortex. In summary, these neuroscientific studies provide evidence that cognitive psychology and social cognitive neuroscience in particular provide an interface between the "hard" sciences and the "soft" skills of human behavior (i.e., decision making).

While it is important to understand how decisions are made at a neuroscientific level, it is also important to identify what financial tools or models are available to assist in decision making at a higher level. While there is no true consensus model of decision making, consistent features can be found in theories emerging from various disciplines (Fellows, 2004). Within organizations, there is a good deal of discussion among leaders with regard to decision making approaches and their long-term financial implications. While the evolution of decision making approaches has become increasingly more sophisticated, complex, and information-intensive, there is still significant dissatisfaction among business and industry regarding existing strategies (Linkov, Kiker, Seager, Bridges, Gardner, Rogers, et al., 2006). Despite the fact many executives "spend a lot of time structuring their decisions, tracing out possible implications, assigning probabilities, and assessing risk" (Amaram & Kulatilaka, 1999, p. 95), the transparency in how their decisions are made and the effects the decisions may have on shareholder value are not always clear.

Rarely does management agree about how a decision will affect the future value of their firm. More importantly "different managers draw on different experiences and have different perspectives, which lead them to different conclusions" (Amaram & Kulatilaka, 1999, p. 95). A need has been created for a rational decision making approach that captures the value of cognitive differences. Through the use of such approaches, managers and individual employees alike can make sound decisions with clear implications. Two common approaches to looking at decision making stem from a normative or descriptive perspective.

In a normative sense, philosophy, moral reasoning, and theology tend to guide the decision making processes. While in the descriptive realm, there is greater emphasis on explaining and predicting organizational behaviors. To better understand these perspectives, O'Fallen and Butterfield (2005) examined several studies relating to ethical decision making across four main categories (a) awareness, (b) judgment, (c) intent, and (d) behavior. Twenty-eight studies produced findings about the independent and dependent variables. Moral intensity and education, employment, job satisfaction, and work experience appeared to yield the greatest number of findings. For example there were a few studies indicated that job satisfaction and professional commitment were positively correlated to ethical sensitivity, while relativism was negatively correlated.

In the "judgment" category, 185 studies reported statistical results. Of the findings, the most common independent variables categories were (a) gender, (b) philosophy/value orientation, and (c) education, employment, job satisfaction, and working experience. Several studies indicated a significant difference between men and women with regard to ethics. Women tended to yield higher scores with regard to moral reasoning and ethics than men (O'Fallen and Butterfield, 2005).

In the "intent" category, 86 studies were examined. Of these, the most common independent variables included (a) philosophy/value orientation, (b) cognitive moral development/ethical judgment, and(c) moral intensity. Similarly moral intensity was found to be highly correlated to intentions. In the "behavior" category, 85 empirical studies produced results. Among the results, code of ethics and gender yielded the greatest number of studies. Pertaining to gender, several studies indicated women made more ethical decisions than men (in terms of quantity). With regard to code of ethics,

results were mixed. However, the majority of studies found that organizations with formal codes of ethics had fewer instances of unethical behavior then organizations without formal codes. Across all of the categories, significant findings were observed between U.S. and non-U.S. respondents. Overall, the research reviewed by O'Fallen and Butterfield (2005) concluded that there are several factors that can influence decision making.

The decision making processes examined in this study seek to quantify and manage judgments and bias, thus yielding more rational decisions. Most modern rational decision making models employ similar processes:

1. Define the problem
2. Identify the decision criteria
3. Develop possible solutions/alternatives
4. Allocate weights and evaluate the solutions/alternatives
5. Select the best solution/alternative
6. Implement and evaluate the results

The organizations selected in this study utilize similar rational decision making processes. The KT decision making model clearly identifies the problem by asking a series of questions. Then the process identifies and lists all possible solutions and criteria. The solutions and criteria are weighted to determine the best possible solution. Using the KT process it is easy to track the progress of a decision, understand the implications and rationale for why the decision was made, and clearly disseminate the information to relevant parties. Through the analysis of the data, this study provides evidence supporting the use of these processes from shareholder value perspectives. The following sections of

this literature review take an in-depth look at the premise of shareholder value in an attempt to provide a solid foundation for its inclusion as a variable.

Shareholder Value and Corporate Finance

World renowned business professor and researcher, Aswath Damodaran contends:

> Every decision made in a business has financial implications, and any decision that involves the use of money is a corporate financial decision. Defined broadly, everything that a business does fits under the rubric of corporate finance. It is, in fact, unfortunate that we even call the subject corporate finance, because it suggests to many observers a focus on how large corporations make financial decisions and seems to exclude small and private businesses from its purview. A more appropriate title for this discipline would be *Business Finance*, because the basic principles remain the same, whether one looks at large, publicly traded firms or small, privately run businesses. All businesses have to invest their resources wisely, find the right kind and mix of financing to fund these investments, and return cash to the owners if there are not enough good investments (Damodaran, February 2, 2009).

Although shareholder value is a relatively new concept, many businesses today base their financial decisions in part on how much value will be added to their shareholders.

The notion of shareholder value was popularized in the 1980s and revised in 1998, when Alfred Rappaport published a book titled *Creating Shareholder Value*. Rappaport discussed how accounting information could potentially be misleading for decision making. He believed that when a firm's objective was to maximize shareholder value, the use of unadjusted accounting numbers had shortcomings; these shortcomings will be discussed in this section of the literature review.

The use of accounting information to determine or evaluate a firm's potential decisions is based on Value Based Management (VBM). As early as the 1800s, forms of VBM were evident. During the onset of the industrial revolution, firms were relying on machines and production workers to achieve economies of scale. Managers put an

emphasis on efficiency and productivity. Performance measures were established to assess the levels of productivity, including the inputs and outputs relative to time (Value based management, 2008).

As companies diversified product lines, they became increasingly more complex. The need to measure the proper allocation of assets was clarified through the introduction of return on investment (ROI). The use of ROI as a measure for assessing investment decisions has become increasingly popular. A recent search of empirical studies pertaining to ROI yielded 42,068 studies (EBSCO Business Source Premier, retrieved Aug 8, 2008). However, using ROI solely for the purposes of making an investment decision can have its limitations, as described by Rappaport.

> Taking an unreliable numerator (i.e., earnings) and relating it to an investment denominator generated by the same accounting process does not solve the problem. Hurdle rates or minimum acceptable rates for ROI are often based on an estimate of the business unit's cost of capital or the corporate cost of capital. The assumption is that if ROI is greater than the cost of capital, then shareholder value will be created. The essential problem with this approach is that ROI is an accrual accounting return and is being compared to a cost of capital measure which is an economic return demanded by investors. Comparing one with the other is clearly an example of comparing apples with oranges (1998, p. 21).

In the late 1930s the concept of the Time Value of Money (TVM) was introduced into corporate finance. TVM has become the most important concept in finance and is also referred to as discounted cash flow (Brigham & Ehrhardt, 2005). Discounted cash flow was originally cited by Joel Dean in 1954, in a highly influential article published in the *Harvard Business Review*. Dean suggested that managers should apply discounting techniques to better understand their investment decisions (1954). Another shortcoming with ROI is its relationship with discounted cash flow (DCF). It has been determined that

ROI is not an accurate or reliable measure of DCF return; moreover, it is often overstated by ROI (Solomon, 1966).

The introduction of major models into the realm of financial decision making continued in the 1960s and 1970s. William Sharpe introduced the Capital Asset Pricing Model (CAPM) in 1964. It was the first asset-pricing model to be derived from economics theory (Fabozzi & Markowitz, 2002). The model helped identify the amount of systematic risk, known as market risk, associated with investing in an asset. The second major contribution to financial decision making was introduced in 1973 by Fisher Black and Myron Scholes as a pricing model for options. The Black-Scholes model quickly became the industry standard for option valuations throughout the world. Important considerations of this model include:

1. The underlying stock provides no dividends or other distributions throughout the life of the option.
2. There are no transaction costs for buying and selling the stock or the option.
3. The known, short-term risk-free interest rate remains constant throughout the life of the option.
4. Any buyer of a security may borrow any fraction of the purchase price at the short-term risk free rate.
5. Short selling is permitted, and full cash proceeds are paid immediately to the seller at the current market price of the security.
6. The call option can only be exercised on the date of expiration.

7. Trading in all securities occurs continuously and the price moves randomly (Brigham & Ehrhardt, 2005).

By following the above considerations investors can in essence produce a riskless hedge. "By buying shares of a stock and simultaneously selling call options on that stock, an investor can create a risk-free investment position, where gains on the stock will exactly offset losses on the option" (Brigham & Ehrhardt, 2005, p. 296). It is important to highlight these popular models and their significance to the field of finance because of their extensive use today. Many companies rely on these models to make financial decisions that will in turn affect shareholder value.

Shareholders want firms to hire managers who are able and willing to take whatever legal and ethical measures necessary to maximize stock price. (Brigham & Ehrhardt, 2005) When managers seek to maximize shareholder value via ill-advised and unethical means, the long-term value of the firm is often eroded. Figure 3 presents external organizational factors, such as global economic factors, government regulation, interest rate levels, and investor behavior that may play a role in decision making and impact shareholder value.

Numerous studies have been conducted that looked at the factors affecting shareholder value. The majority of the studies relating to shareholder value have looked at actions or variables that affect a firm (Hanvanich, Richards, Miller, & Cavusgil, 2005; Kaplan & Norton, 2004; Mahajan & Lummer, 1993; Smith, 2006; Wyatt, 1989). For example, the study conducted by Mahajan and Lummer (1993) provides insight into how corporate events can affect shareholder value in both positive and negative ways. They considered two events in their study: (a) "An executive losing decision making authority

and (b) the hiring or promotion of another executive to fill the void created by the first event" (p. 393).

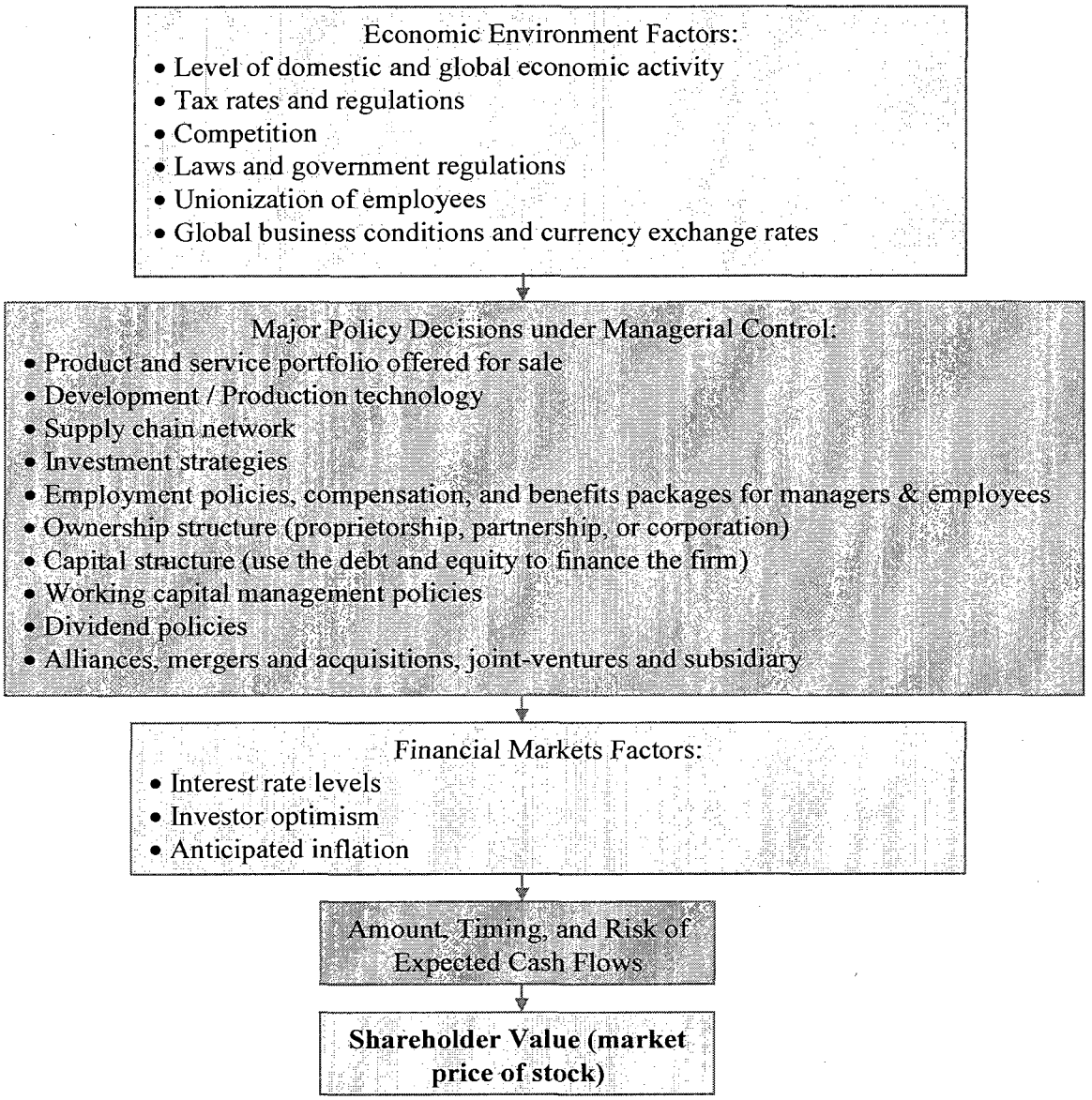

Figure 3. Factors Affecting Shareholder Value. Adapted from "*Managerial Economics: Applications, Strategies and Tactics with Economic Applications,*" by McGuigan, Moyer, & Harris, 2005.

Mahajan and Lummer utilized an event study methodology to test their hypotheses with a final sample of 498 human resource announcements from 1972 to

1983; the sample data were stratified into categories: firings, mandatory retirements, forced resignations, reshuffles, deaths, and voluntary resignations. The use of the categories helped further explain the data through hypothesis testing. At a high level their hypotheses examined organizational instability and negative firm value caused by decisions regarding managerial changes or reshuffling, and compensation (Mahajan & Lummer's 1993).

Based upon the results of the event study analysis, the abnormal return for all 498 observations was –0.2%, which indicates that changes in management showed little to no effect on shareholder value. The stratified data revealed that in companies where there was a loss of power or a death, there was a significantly positive impact on shareholder value. This study demonstrated the importance of thorough data analysis and will be discussed in greater detail in the next chapter. There are numerous ways of assessing the impact on shareholder value which is explored the following pages.

Measuring shareholder value is commonly assessed through a variety of financial metrics. At its most basic level shareholder value can be expressed as:

SHV = Company Value – Debt Claims

Determining the debt claims owed to a company is straightforward; however determining the true value of a company can be extremely complex. As shown in Figure 4, Brigham and Ehrhardt (2005) offer several factors that should be considered when conducting a firm valuation such as: sales, operating costs (including operational investments), interest rates, market risk and firm risk.

In addition to these factors the size, timing, and risk of expected future free cash flows to determine the value of a firm.

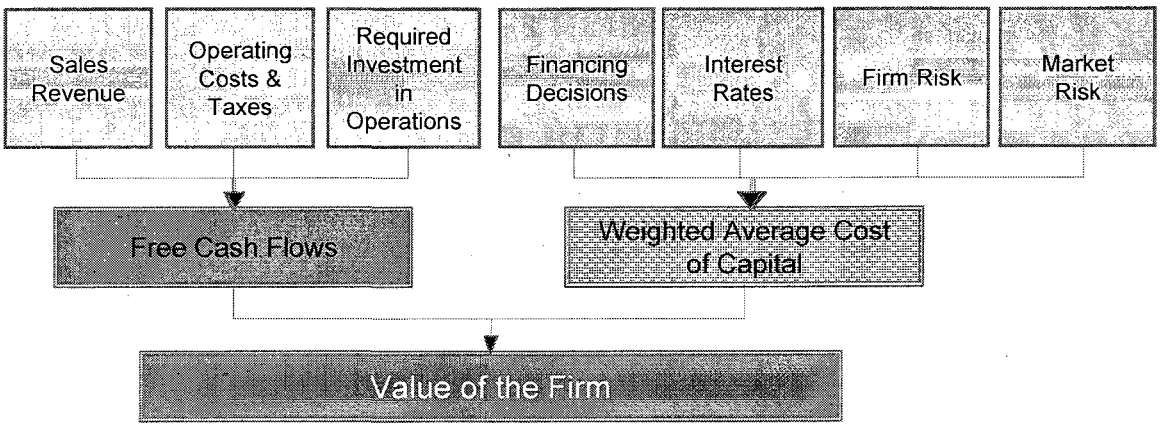

Figure 4. Corporate Valuation Model. (Brigham & Ehrhardt, 2005, p. 508).

Alternative financial metrics have included return on assets (ROA) and economic value added (EVA). Nelson and Winter (1982) believe that firm-specific ROA is the best unit of measurement for organizational capabilities. The standard approach has been to explore the relationship between the various metrics, such as ROI, ROA, EVA, and subsequent stock market performance (Booth, 1998). Booth considers EVA to be the "grand-daddy" of shareholder value creation. Similarly, Fabozzi and Markowitz (2002) consider EVA to be the chief measure of corporate financial success.

EVA was first proposed by Stern and Stewart in the early 1990s. It was used as a performance measure for a means of making better investment decisions. Over the past decade EVA has become increasingly known in other areas of performance measurement. For the purposes of this study, it is important to recognize some of the reasons why firms choose to adopt EVA as a performance metric. Companies that have adopted EVA as a means of enhancing firm performance have outperformed their peers as well as the

market. A recent study reported an average return of 36.5% for EVA users, which " beat the S&P 500 by a total of 69.8%" (Stewart, Ellis, & Budington, 2002, p. 1). Refer to Figure 5 for a snapshot of their research findings.

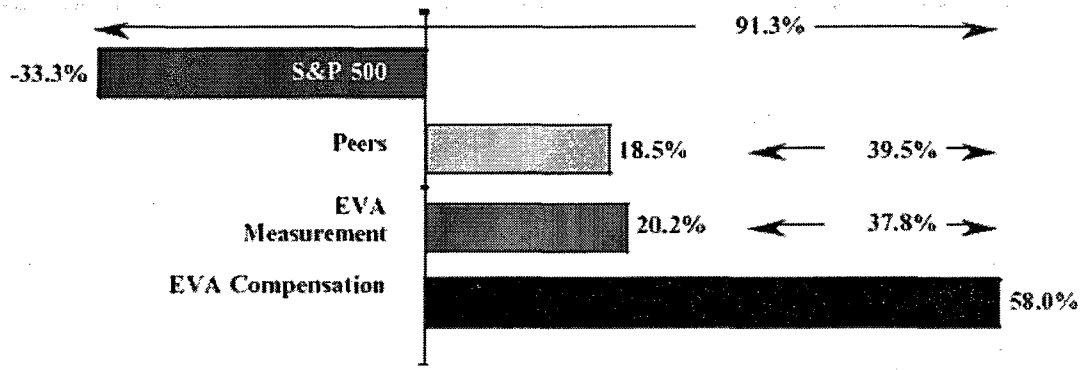

Figure 5. Corporate EVA Uses: Total Market Returns (Stewart, Ellis, & Budington, 2002).

EVA has been defined as a "measure of the management's ability to add value to tangible assets by creating and leveraging intangible assets" (Bhalla, 2004, p. 13). Based upon Stewart, Ellis, and Budington's research, companies that employ EVA approaches are clearly adding greater shareholder value. The greatest shareholder returns are evident when companies link EVA to compensation incentives. As shown in Figure 5, firms utilizing EVA compensation linked strategies outperformed the S&P 500 by 58%. EVA approaches are incorporated into many organizational processes, from strategy and decision making to performance evaluation. EVA can be used to assess management's ability when it is linked to compensation plans. EVA has also been incorporated into measuring the value of outsourcing, human capital, strategy development, and decision making (Bhalla, 2004; Brigham & Ehrhardt, 2005; Young & O'Byrne, 2001).

Companies that have experienced success in implementing a value metric approach such as EVA typically connect it to a rigorous evaluation of their strategy and

structure as well as an ongoing commitment to training and communication (Kroll, 1997). The effects of value-based approaches on intangibles have recently been studied at Harvard. Based upon the responses from value-based management surveys, companies implementing an EVA approach reported several intangible benefits including: (a) improved strategic planning, (b) more efficient resource allocation, (c) improved focus on capital, (d) enhanced business literacy, (e) improved decision making, (f) more effective organizational communication, and (g) owner-like behavior from managers. (Gandhok & Kulkarni, 2005)

EVA, like all metrics, has limitations. Brewer, Chandra, and Hock (1999) proposed four limitations: size differences, financial orientation, short-term orientation, and results orientation. With regard to size, EVA does not control for differences among business units (Hansen & Mowen, 1997; Horngren, Foster, & Datar, 1997). In other words, a large business unit will tend to yield a higher EVA relative to smaller counterparts. When considering its financial orientation, EVA relies on financial accounting methods of revenue realization and expense recognition. As noted in prior sections of this literature review, managers can sometimes manipulate these numbers by altering their decision making processes (Horngren, et al., 1997: Sender, 2001). Brewer, et al., (1999) found that:

> The temptation to manipulate the accounting numbers would be genuine for any manager who knows they dramatically improved their performance in ways that are not immediately reflected in the accountants' ledgers. Nothing de-motivates managers faster than being unjustly penalized by a financial measure, such as EVA, that fails to accurately depict their true level of effort and performance. (p. 8)

EVA tends to overemphasize the need to generate short-term results and in doing so creates a disincentive for managers to invest in long-term projects. Accounting

managers rely on their historical financial reports to derive firm performance, but when performance is less than expected, they rarely have solutions to the financial woes. Nonaccounting business managers—who are responsible for continuously driving customer value—are concerned with nonfinancial measures, such as yield and throughput, and with focusing on the root cause drivers of these measures. (Johnson & Kaplan, 1987; McKinnon & Bruns, 1993). EVA being a financial metric does not offer solutions for value-based drivers.

While these limitations cannot be fully offset, a more encompassing approach to shareholder value includes intangible variables. For example, if an organization is concerned with increasing bottom-line profits, then they may also want to consider the following factors: vision and leadership. Although these variables can be assessed via traditional data collection methods (i.e., survey), a few studies have analyzed their relationship to firm profitability. Through their research, Bennis (1989) and Collins and Porras (1996) have determined that financial resource allocation is a concern to shareholders. Thus, return on invested capital (ROIC) should be used to assess organizational vision and leadership capabilities. Although financial metrics provide a clear means of assessing shareholder value, other metrics have been used such as leadership and vision, culture, and resources.

In adopting a value-based approach, Rappaport (2006) contends that firms can sustain shareholder value creation by adhering to 10 principles:

1. Do not manage earnings or provide guidance.
2. Make strategic decisions that maximize expected value even at the expense of lowering short-term earnings.

3. Make acquisitions that maximize expected value, again, even at the expense of lowering short-term earnings.
4. Carry only value maximizing assets.
5. Return cash to shareholders when there are no credible value-creating opportunities to invest in the business.
6. Reward senior executives for delivering superior long-term returns.
7. Reward operating-unit executives for adding superior multi-year value.
8. Reward middle managers and frontline employees for delivering superior performance on key value drivers that they influence directly.
9. Require senior executives to bear the same ownership risks as shareholders.
10. Provide investors with value relevant information.

These principles offer viable means for sustaining shareholder value creation and can be captured through an event study methodology which measures the instantaneous change in shareholders' assessment of these factors in response to the announcement. This literature review concludes with an overview of the methodology used in this study.

Event Study Methodology

The use of Event Study methodology dates to the late 1960s and has become widely accepted as a standard approach to assessing firm performance. Fama, Fisher, Jensen, and Roll (1969) developed an application of the new Center of Research for Security Prices (CRSP) monthly return data. In doing so, they sparked a methodological revolution in the fields of accounting, economics, and finance. A seminal event study was conducted by Brown and Warner in 1985. Since these works, event studies have become known as the standard methodological approach in the field of finance (Binder, 1998).

Event studies as previously indicated in Table 1 have been used extensively for empirical research across numerous disciplines.

Fama et al. (1969) examined the effects of stock split announcements on security prices using the CRSP database. To determine the impact of the announcements, they controlled normal relationships between the return on the stock during a specified period of time (month *t*) and the return on the NYSE portfolio. They collected stock market prices from 1926 to1959, including the time of events. They were then able to estimate the market parameters using regression analysis. The event period in their study lasted from 29 months before the announcement to 30 months after and the month of the split announcement was considered time zero. Therefore, the event period ran from s = -29 to s = +30.

To determine which stocks would be excluded due to market factors, the following steps were conducted (Fama et al., 1969):

1. The parameters of the linear monthly rate of return model were estimated for each security using all available data.
2. The sample regression residuals were computed for each split for the designated months preceding and following the event.
3. If there was a significant difference between the number of positive and negative residuals in a given month, the data was then excluded from the sample.

The largest positive average returns were noticed during the three to five months following the stock split. Also evident from the analysis was that splits tended to occur during general "boom" periods, and the particular stocks that were split tended to be

those that performed "unusually" well during episodes of general price increases (Fama et al., 1969).

By redefining the time relative to the event month, stock price movement can be analyzed during the specific months surrounding each announcement or event (Binder, 1998). The residuals from the market model were used for the month corresponding to "s," as an estimator of the abnormal return for each stock during the event month. For example, if General Electric announced a stock split in March 1950, then March would be considered the event month at s = 0 and the estimated abnormal return during the three months prior to the split (s = -3) would be the residual for that calendar month. By calculating the residual, the market specific variables that could affect the firm's stock price are cancelled out, therefore leaving any abnormal return directly attributable to specific events of the firm. Market specific versus firm specific variables could include factors such as those indicated in Table 3.

Table 3

Market and Firm Specific Variables

Market Specific	Firm Specific
• Movements in the economy	▪ Acquisition activity
• Interest rate changes	▪ Security offerings
• Inflationary expectations	▪ Capital expenditures
• Monetary policy changes	▪ Earnings announcements

This dissertation controls for the market specific variables by eliminating those firms whose event date falls on or near contaminating information specific to each firm (refer to Chapter III for a more detailed description of contaminating information).

Numerous studies have considered different types of firm specific variables. Table 1 represents a few of the areas in which event studies have been used over the past two decades. These studies indicate that empirical research has been done in analyzing stock price performance of various companies with regard to corporate events. The italicized studies will be expanded upon throughout this section as they relate to the other variables in this dissertation, decision making and shareholder value.

Mahajan and Lummer (1993) looked at the effects of senior management changes on the stock price of the firm and shareholder value. They considered a change in management to be twofold: (a) an executive losing decision making authority, and (b) the induction of another executive to fill the vacant position created by the first event. A change in management was defined as "a change in the management team comprised of the chairman of the board, the chief executive officer, and the president" (Mahajan & Lummer, 1993, p. 393).

Using a standard event study methodology, the hypotheses examine organizational instability and negative firm value caused by decisions regarding managerial changes / reshuffling. Additionally, changes to management compensation are perceived to adversely affect shareholder value. External organizational factors regarding these changes are expected to be preferred by shareholders (Mahajan & Lummer, 1993). A final sample of 498 observations of management changes were gathered from *The Wall Street Journal* between 1972 and 1983. Based on this sample, an abnormal return (AR) of -.02% was reported indicated that overall, management changes had little or no effect on shareholder value. However, stratification of the data based upon a loss of power yielded an AR of .24%. Reshuffles of the same management team yielded

an AR of -.50 %. Similarly when an executive left the company, severing all ties, an AR of -.15 was found. Based upon the findings of the analysis, the market perceived these changes in management to be negative. Similar event study analyses regarding shareholder value have been conducted as in the next example.

Hanvanich (2002) examined the level of shareholder value created from 240 joint venture (JV) announcements between 1980 and 1998. The CRSP database and Yahoo Finance Website were used to obtain the necessary data. Through the application of event study methodologies, Hanvanich tested the differences between JVs with parents firms located in the US, and JVs that receive manufacturing or technology knowledge.

The analysis indicated an abnormal return for the entire sample of 1.38%. These findings were consistent with studies pertaining to joint venture announcements (Koh & Venkatraman, 1991; McConnell & Nantell, 1985; Reuer & Koza, 2000). Further stratification of the data into three categories – "Local Market Access," "Manufacturing Learning," and "Technology Learning" – yielded different effects both within and outside the United States. For Local Market Access the CAR was .64% and 1.77%. For Manufacturing Learning the CAR was .08% and 1.52%. And for Technology Learning the CAR was 1.36% and 1.39% (outside U.S. and inside U.S. respectively). Overall, the three hypotheses were not supported.

Hanvanich, Richards, Miller, and Cavusgil (2005) conducted another event study concerning Joint Venture (JV) announcements. The researchers investigated the effect of technology on shareholder value creation and its interactions with task relatedness and cultural differences. The level of shareholder value created was measured by the difference between the actual stock return and the expected return, also known as the

abnormal return. When the abnormal returns surrounding the event date are summed, the CAR is produced. Thus the CAR of each firm represents the level of shareholder value creation. The researchers tested the hypotheses regarding the JV formation between high tech vs. low tech firms, cultural differences, and task relatedness between the JV and the parent firm.

By gathering the data from Thompson Financial Security Data and the CRSP, these hypotheses were tested using a standard event study methodology. The sample consisted of 379 domestic joint ventures and 489 international joint ventures between the years of 1997 and 1999. Technology was measured by classifying each parent company into either high technology or low technology industries. The difference in national culture was assessed using cultural dimensions and distance measures set forth by Hofstede (1983) and Kogut and Singh (1988), respectively. Task relatedness was used as a dichotomous variable where the JV and the parent company were measured in the same industry group (= 1), and measured in different industry groups (= 0).

The results supported the researchers' previous findings as well as those of other researchers (Hanvanich, 2002; Koh & Venkatraman, 1991; McConnell & Nantell, 1985; Reuer & Koza, 2000). The CAR associated with the total sample of JV announcements was .545%. All three hypotheses were supported concluding that joint ventures are typically perceived by the market to increase shareholder value.

Given that event study methodologies are being used to assess the impact of managerial decision making, it is important to consider whether results have been reported clearly and whether the interpretations of results has been appropriate (McWilliams & Siegel, 1997). It has been well established that the usefulness of the

analytical techniques depends heavily on a set of rather strong assumptions (Brown & Warner, 1980, 1985). McWilliams and Siegel (1997) identified three assumptions upon which the usefulness of the analytical techniques relies:

1. Market Efficiency – this assumption is the basis for the use of event studies. It implies that stock prices incorporate all relevant information available to the market. Any new information can be considered an event and studied by researchers based upon the impact on the stock price.
2. Unanticipated Events – the market did not previously have the information about the event and therefore abnormal returns can be assumed to be the result of the market's reaction to the information.
3. No Confounding Effects – the researcher isolates the effect of the specified event from the effects of other events. Confounding effects may include merger announcements, unexpected earnings, change in management, declaration of dividends, signing of governmental contracts, or a new product announcement.

The longer the event window, the more difficult it is to control for these assumptions. However, by eliminating those companies with known confounding information from the sample, it drastically decreases the potential effects mentioned above.

Abowd, Milkovich, and Hannon (1990) looked at the effects of management decisions on shareholder value through an event study methodology. More specifically, they examined the effects of human resource management decisions. Information was gathered on 647 events in 1980 and 1987 from *The Wall Street Journal* and CRSP database. The events included (a) changes in general HR systems, (b) increase or

decrease in compensation/benefits, (c) increase or decrease in staffing, (d) relocation/shutdown, and (e) miscellaneous (health/safety). The researchers predicted that it would be difficult to measure the effects of some of these categories because a direct model of the expected announcement was not available. There was an overall lack of predictability in the HR decisions for both 1980 and 1987. The only category that yielded a statistically significant CAR was a "temporary staffing reduction" at -1.19%. Although difficult to fully assess, this study provides some evidence that HR decisions can have influence on stock prices.

Conclusion

Numerous studies have been conducted regarding the diverse perspectives of decision making and shareholder value. While these topics have been extensively studied independently, their combined implications remain relatively unexplored. This literature review using an event study methodology through which a synthesis of prior works builds support for this collective research. From the 19th Century to the present, decision making has been studied across numerous disciplines. While the early studies stemmed from economics, more recently, decision making has been analyzed from the cognitive neuroscientific perspective.

From an organizational perspective decision making is often assessed on a financial basis. Which capital budgeting initiatives are yield the greatest NPV? Which subsidiaries should be divested to increase profitability? One common way of assessing the value of managerial decisions is the level of shareholder value created. Using financial metrics such as ROA, ROI, and EVA, researchers can produce theories and methodologies for assessing shareholder value and firm performance. Other methods of

assessing shareholder value include intangible variables including vision and leadership capabilities. The scope and reach of these intangible benefits is being further explored within the discipline of cognitive psychology.

The number of studies exploring decision making behaviors and constructs are rapidly expanding. Neuroscience researchers have entrenched themselves into this discipline and recently identified the cortical areas of the brain involved decision making. Advanced neurological tools and techniques are being used to further identify the neural activity associated with specific types of decisions and choices. The convergence of the cognitive psychology, decision making, and corporate finance will continue to evolve as future studies build upon the existing body of literature.

CHAPTER III – METHODS

This chapter discusses the research methods used in this study. The Chapter sections focus on the following topics: (a) research approach and rationale, (b) procedures for selection including sample and measures, and (c) procedures for collection/analysis including data analysis, validity and reliability.

Research Approach and Rationale

> Financial metrics to measure performance, guide decision making, and gauge whether shareholder value is created, are being used more today than at any other time in recent corporate history. But of all the fashionable value calculations, the biggest determinant of total return to shareholders is still meeting, beating, or missing what the stock market expects a company to earn (Copeland, 2002, p. 48).

An event study methodology can be used to assess stock market reactions to corporate events. Event studies have become increasingly common in financial research, to the point where they are now considered a standard. Some of the most well known early event studies include seminal studies by Fama, Fisher, Jensen, and Roll (1969), Brown and Warner (1985), Sefcik and Thompson (1986), Ball and Torous (1988), and Barber and Lyon (1995).

There are five general steps involved in an event study methodology:

1. Identifying the events of interest
2. Modeling the normal (expected) total shareholder return
3. Estimating the abnormal (unexpected) total shareholder return
4. Analyzing and summarizing observed abnormal returns (Abowd, Milkovich, & Hannon, 1990).

Event studies are "natural experiments that assess the impact of an event on a firm's market value using expected returns as a benchmark" (Hanvanich, 2002, p. 20). The event in this research is the implementation of decision making processes. To determine the impact of the decision making processes, the difference between actual and expected stock returns on the implementation day is computed. Any differences realized on the implementation day are referred to as an Abnormal Return (AR). In addition to examining ARs on the announcement date, various multi-day event windows are also examined. These time intervals are specific to each company relative to their implementation date, which could be a specified number of days before or after an event, known as the event window. For this study the event windows ranged from five days before the event to five days after the event.

In summing the ARs, Cumulative Abnormal Returns (CAR) are produced and represent the amount of shareholder value added, if any, related to the adoption of decision making processes. The CARs reflect the shareholders' assessment of the impact of adopting the proprietary decision process on the future decision making performance of the company and are reflected in the stock market response.

Calculating CAR

CARs are typically measured using the traditional event study methodologies employed by Brown and Warner (1985). The announcement date, or the date on which the company's adoption of the decision process is publicly posted to the KT website, is considered the event date (day = 0, or t = 0). The trading days prior to implementation are considered day -1, day -2, and so on; while the days following the implementation are

referred to as day +1, day +2, and so on. An ordinary least squares metric estimates the parameters of the market model during the 255 day estimation period, (t = 255 to t = 10).

The relationship between variables is denoted as:

$$r_{it} = \alpha_t + \beta_i r_{mt} + e_{it}$$

Where r_{it} is equal to the adopting firm's return, r_{mt} is equal to the market's return, β_i is the level of systematic risk, and e_{it} is equal to the residual or abnormal expected return. The client's risk-adjusted abnormal return (AR) on day (t) is denoted as:

$$AR_{it} = r_{it} - \hat{\alpha}_i - \hat{\beta}_i r_{mt}$$

Where *(AR)* is the abnormal return of client (i) during day (t), which determines the impact of implementation in firm (i) on day (t). Any abnormal returns created from the implementation represent an increase in shareholder value. The alpha and beta coefficients are determined from each client's estimation-period regression. Despite the fact that the implementation date is considered day zero, it is often the case that firms began utilizing some of the tools before full implementation occurs, so a 255 day estimation period, and an 11 day event window is used.

Based upon this approach the cumulative abnormal returns (CARs) for the implementation period are denoted as:

$$CAR_i = \sum_{t=T_1 to T_2}^{+1} AR_{it}$$

Where T_1 and T_2 denote the beginning and ending days of the event window. The CAR represents cumulative shareholder value creation over the event window. The cumulative average abnormal return or CAAR is the arithmetic average of the CARs of the all the

clients in this study. The variable is computed by summing the CARs across all companies.

Procedures for Sample Selection

The source of the client data was obtained from Kepner Tregoe, an international management-consulting firm located in the northeastern United States. Their business philosophy is that effective action follows clear thinking, and thus they have designed a proprietary decision making process that facilitates explicit thinking. They currently have offices in 14 countries and provide services to organizations in numerous industries and sectors.

To determine sample eligibility from the firm's client base, the following criteria were applied to 78 clients listed on the KT website:

1. Use of the proprietary decision making tools as indicated by KT
2. Availability of necessary financial data from CRSP database.
3. Identifiable potentially contaminating information.

Potentially identifiable contaminating information would include an earnings announcement, acquisition activities, dividends announcement, and security offerings. If any potentially contaminating information regarding a client is released three days prior to or after the implementation date, the client is omitted from the study.

Of the original 78 clients, 49 had adequate availability of financial data from the CRSP database and no known contaminating information. Various pieces of information were gathered about the clients; however, of foremost importance was the adoption date of the decision making processes and specified financial data, which was considered to be the date that the clients were posted to the KT website and became public knowledge.

Sample

Using the criteria discussed, approximately 49 companies were selected for analysis. The companies spanned various industries and sectors. Table 4 represents the possible SIC codes that the data fell into.

Table 4

SIC Groups and Sectors

SIC Group	Sector
01xx - 09xx	Agriculture, Forestry, and Fishing
10xx - 14xx	Mining
115xx - 17xx	Construction
20xx - 39xx	Manufacturing
4xxx	Transportation, Communications, Electric, Gas, and Sanitary Services
50xx - 51xx	Wholesale Trade
52xx - 59xx	Retail Trade
60xx – 67xx	Finance, Insurance, And Real Estate
70xx – 89xx	Services
91xx – 99xx	Public Administration

Note. This table displays the industry breakdowns according to their respective SIC codes

In addition to the event study analysis, various financial metrics are reported to provide further descriptive information about the sample. While these descriptive financial metrics cannot be used as a comparison they do provide insight into the size and performance of the adopting firms. Table 5 displays the commonly used financial ratios divided into four main categories.

Table 5

Commonly Used Financial Ratios

Profitability Ratios	Liquidity Ratios	Solvency Ratios	Valuation Ratios
Operating Margin	Working Capital T/O	Free Cash Flow	Price to Book
Return on Equity	Inventory T/O	Interest Earned	Price to Sales
Return on Assets	Current Ratio	*Debt Outstanding*	Price to Cash Flow
Profit Margin	Accounts Receivable Turnover (T/O)	Total Debt to Total Assets	*Price to Earnings*

Note. This table highlights financial metrics that are commonly used to compare firms on the basis of financial ratios. Italicized metrics are metrics used in this study to further explain the data.

Since high revenues alone do not necessarily translate into increased stock prices unless a company is able to clear all of its expenses, investors need to know how likely the company is to turn a profit (Elmerraji, 2006). Profitability assessments include ratios and margins. Two of the more common ratios are Return on Equity (ROE) and Return on Assets (ROA). Common margins include Profit Margin, Sales Margin, Operating Margin, and Gross Margin. The ROE and ROA ratios were used in this study to further examine the data. The Return on Equity (ROE), and is calculated by:

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Owners' Equity}}$$

Often the greater a firm's ROE, the higher they are ranked relative to their profitable competitors simply because of their financing choices. Similarly the ROA provides a solid measure of profitability yet is driven extensively by industry type.

The calculation for ROA is:

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}}$$

It is important to note that what is considered 'normal' for this and other ratios can vary across industries. For example, service oriented industries may have higher ROAs compared to, say, manufacturing firms because a majority of their assets are human capital talent which are not easily quantified on a firm's balance sheet.

The next category of ratios determines how quickly a firm's assets can be liquidated or converted to cash. Investors like to know how quickly a company's assets can be used to repay debt, acquire additional assets, or be applied to standard business operations. A good way to measure liquidity is by looking at the firm's ability to collect on debts and money owed to them (Elmerraji, 2006). The Accounts Receivable Turnover (ART) ratio is calculated by:

$$\text{Accounts Receivable Turnover} = \frac{\text{Net Credit Sales}}{\text{Average Accounts Receivable}}$$

This ratio represents the frequency in a given period the money owed to the firm can be collected; the greater the number, the more accounts that can be collected, thus better liquidity for investors. Firms can use the accounts receivable turnover results to establish baselines for selecting particular clientele. Similarly, individual investors can apply this number to their investment decisions. Within this study, ART was not applicable to all companies due to the nature of their businesses and therefore was not used.

Solvency ratios are unique in that they provide a forward-looking perspective of a firm's financial obligations. The obligations are assessed by the total debt and are compared to the total assets of the firm, for example:

$$\text{Total Debt to Total Assets} = \frac{\text{Short Term Debt} + \text{Long Term Debt}}{\text{Total Assets}}$$

This ratio determines how many of a firm's assets were paid for with debt. This is an important decision making criterion that is often compared across industry and competitors. As the number approaches zero, it means that more assets were furnished without acquiring more debt. Higher debt is generally associated with greater risk but may also result in higher ROE due to the effect of lveraging. Total debt outstanding was calculated for the KT clients and can be found in the results section.

The last ratio to be discussed for the purposes of this study is a valuation metric known as the P/E ratio. "The Price to Earnings ratio is the most well-known valuation ratio that compares the company's stock price to the amount of earnings it generate on a per-share basis" (Elmerraji, 2006, p. 2). The P/E ratio ties in nicely with the event study methodology used in this research because it can be viewed as an indicator of an investor's expectation of future performance. Similar to an event study, the P/E ratio assesses changes in expected stock price versus realized stock price through corporate earnings.

The P/E ratio is calculated as:

$$\text{Price to Earnings} = \frac{\text{Market Value Per Share}}{\text{Earnings Per Share}}$$

Like the previous three metrics, the P/E ratio can be compared to competitors and to the overall market, but should not be used for inter-industry comparisons because of substantial variation. From a decision making standpoint the P/E ratio determines how much investors are willing to pay for $1.00 of earnings in a particular company. Therefore the higher the ratio, the more people are willing to spend to acquire ownership in that firm.

Measures

All single measurements have flaws. In addition, conventional performance measurements have serious limitations in assessing strategic performance – to the extent that they can actually inhibit strategic action at some levels (Suutari, 2001). Strategic actions can be considered management decisions for the scope of this research. Fixing these flaws does not entail omitting previous works, but rather combining their methodologies. Thus, the measures in this study are compiled from numerous techniques previously discussed. Bates contends:

> The availability of good measures assumes that particular attributes of interest can be identified and assessed. However, the attributes like performance can sometimes be difficult to quantify because of their complexity and magnitude. Problems of performance definition, measurement, and interpretation can also be compounded by the social context of organizations...When performance attributes resist accurate and consistent definition, measurement problems such as low reliability, contamination, and inaccuracy arise. Inevitably, there are then difficulties in data interpretation because the information is ambiguous (As cited in Gilley & Maycunich, 2000, p. 206-7).

To ensure use of good measures the financial data for this study were collected from CRSP using techniques that are highly regarded in the field of finance. Most academic research employing event studies on United States securities market data uses daily or monthly stock returns from the CRSP database.

Procedures for Collection/Analysis

Research has shown that stock market responses to corporate events provide reliable indications of future performance and value (Barber & Lyon, 1995; Healy, Palepu, & Ruback, 1992). In applying the event study approaches outlined in this chapter, the decision making clients were assessed using various statistical parameters set forth by Brown and Warner (1985). Once the 49 companies were selected from the client list as

adequate participants, their historical stock price data for the time periods corresponding to the various event dates were downloaded from the CRSP database using Eventus® software.

Eventus® software estimates the expected return by using statistical modeling of the relationship between total shareholder return over the given holding period with the return on the overall market. The abnormal return is computed as the difference between the holding period total shareholder return and its estimated expected value given the return on the market.

Validity/Reliability

To ensure validity and reliability, the methods for obtaining the sample and analyzing the data are based on prior studies with demonstrated soundness (Ball & Torous, 1988; Barber & Lyon, 1995; Brown & Warner, 1985). Various problems can occur in event studies as reported by Binder (1998). However, Binder believes that the problems can be resolved. "Often many of the problems can simply be ignored, because, in practice, they are quite minor" (Binder, 1998, p. 116). Problems with cross-sectional dependence can be minimized when the event periods are dispersed throughout calendar time, as they are in this study. Choosing securities from different industries also minimizes the effects of cross-sectional dependence (the sample of clients in this study were from various industries). Lastly, when the event period is short relative to the estimation period the issue of time series dependence in the average abnormal returns are unimportant (Binder, 1998).

CHAPTER IV – RESULTS

The purpose of this chapter is to summarize the results of the methodologies employed. Tables and figures are used to clearly present the data. Using Eventus software, shareholder value was measured by the cumulative average abnormal stock returns (CAAR) associated with using the decision making tools. Table 6 displays the event study results for the entire sample described in Chapter III.

Table 6

Analysis of CAARs for all Decision Making Clients

Event Window	N	CAAR (%)	Z value	Postive: Negative	Generalized Sign Z
(-5,-3)	49	0.80	1.072	27:22	1.024
(-2,-2)	49	0.64	1.037	31:18	2.168*
(-1,-1)	49	0.52	1.890*	35:14	3.312***
(0,0)	49	0.35	1.169	29:20	1.596$
(+1,+1)	49	0.19	0.00	22:27	-0.406
(+2,+2)	49	-0.59	-0.98	22:27	-0.406
(+3,+5)	49	-0.37	-1.039	18:31	-1.550$

$ Indicates significance at the 0.10 level using a one-tailed t-test

* Indicates significance at the 0.05 level using a one-tailed t-test

** Indicates significance at the 0.01 level using a one-tailed t-test

*** Indicates significance at the 0.001 level using a one-tailed t-test

Note. CAARs denote cumulative average abnormal returns to shareholders, and *z*-values measure significance over the indicated event window. The generalized sign *z* statistic tests for significance based on the ratio of positive:negative CAARs for each partition. The sample covers the 1994-2005 time horizon and consists of 49 companies.

The previous table reports the analysis for all 49 decision making clients among each of the event windows. When looking at the entire sample, the CAARs range from .80 at the (-5,-3) event window to -.59 at the (+2,+2) event window. The most significant CAAR occur in the event windows leading up to the event date. For example on day (-1,

-1) the CAAR is .52% and statistically significant at the 0.001 level ($z = 3.312$). While the overall response is positive, the percentage of negative CAARs during this time is approximately 40 % (14/35).

Based upon these findings, it is important to explore the data in greater detail. For the next analysis, the data were partitioned using the SIC codes for a cross-industry analysis. The original industries were classified using SIC codes from the SEC and the data were partitioned into the following categories: (a) consumer and manufacturing; (b) electric, telecom and information technology; (c) energy; (d) pharmaceutical; and (e) other. Table 7 reports the industry analysis for the decision making clients among each of the event windows.

Table 7

Analysis of CAARs by Industry Partitions

Data Partitions	Event Window	N	CAAR (%)	Z value	Postive: Negative	Generalized Sign Z
Consumer and Manufacturing	(-5,-3)	6	-0.60	-0.551	3:3	0.103
	(-2,-2)	6	1.17	1.309$	5:1	1.737*
	(-1,-1)	6	0.39	0.630	4:2	0.920
	(0,0)	6	0.58	0.851	3:3	0.103
	(+1,+1)	6	-0.69	-1.256	1:5	-1.532$
	(+2,+2)	6	0.02	-0.115	4:2	0.920
	(+3,+5)	6	0.67	0.381	3:3	0.103
Electric, Telecom, & Information Technologies	(-5,-3)	13	.81	-0.049	7:6	0.512
	(-2,-2)	13	1.33	1.225	9:4	1.624$
	(-1,-1)	13	0.48	0.072	10:3	2.180*
	(0,0)	13	1.39	1.664*	11:2	2.736**
	(+1,+1)	13	-0.29	-0.504	4:9	-1.155
	(+2,+2)	13	-1.42	-0.445	6:7	-0.044
	(+3,+5)	13	-0.95	-0.755	4:9	-1.155

Data Partitions	Event Window	N	CAAR (%)	Z value	Postive: Negative	Generalized Sign Z
Energy	(-5,-3)	5	-1.06	-0.478	1:4	-1.291$
	(-2,-2)	5	-0.49	-0.186	3:2	0.498
	(-1,-1)	5	1.56	2.265*	4:1	1.393$
	(0,0)	5	-0.28	0.089	2:3	-0.397
	(+1,+1)	5	0.14	0.077	4:1	1.393$
	(+2,+2)	5	0.58	0.372	2:3	-0.397
	(+3,+5)	5	1.66	0.658	2:3	-0.397
Pharmaceutical	(-5,-3)	5	1.58	0.905	3:2	0.481
	(-2,-2)	5	-0.12	-0.465	2:3	-0.414
	(-1,-1)	5	-0.57	-0.571	2:3	-0.414
	(0,0)	5	0.34	0.581	5:0	2.270*
	(+1,+1)	5	-0.88	-0.996	1:4	-1.309$
	(+2,+2)	5	0.38	0.039	2:3	-0.414
	(+3,+5)	5	1.00	0.949	4:1	1.375$
Other	(-5,-3)	20	1.48	1.806	13:7	1.540$
	(-2,-2)	20	0.52	0.244	12:8	1.092
	(-1,-1)	20	0.59	1.708*	15:5	2.435**
	(0,0)	20	-0.24	-0.313	8:12	-0.699
	(+1,+1)	20	1.06	1.459$	12:8	1.092
	(+2,+2)	20	-0.76	-1.318$	8:12	-0.699
	(+3,+5)	20	-1.16	-2.030*	5:15	-2.042*

$ Indicates significance at the 0.10 level using a one-tailed t-test
* Indicates significance at the 0.05 level using a one-tailed t-test
** Indicates significance at the 0.01 level using a one-tailed t-test
*** Indicates significance at the 0.001 level using a one-tailed t-test

CAAR differences across the industries are evident throughout various event windows. The greatest differences can be seen in the days leading up to and during the event day. For example in event window (-2,-2), the CAARs range from -.49% to positive 1.33% (see Table 7). The category with the highest CAAR during this event window was electric, telecom, and information technology at 1.33%, statistical

significance at the .10 level (z = 1.624$). The energy partition had the lowest CAAR of -.49% was not statistically significant.

As shown in Table 7, the (-2, -2) event window results have a similar range to the next event window. During the (-1,-1) event window the CAARs ranged from -.36% to 1.56%. The highest CAAR during this event window was in energy at 1.56%, and statistical significance at the .10 level (z = 1.393$). The pharmaceutical partition had the lowest CAAR of -.36% but was not statistically significant.

During the event day (0, 0) the CAARs ranged from -.28% to 1.39%. The highest CAAR during this event window was in electric, telecommunication, and information technologies at 1.39%, with statistical significance at the .01 level (z = 2.736**). The lowest CARR of -.28% was in the energy category and was not statistically significant. Factors contributing to the level of CAAR significance during the actual event day and potential reasons for differences across industries are discussed in the next chapter.

The next partitioning of data looks at small versus large cap firms as measured by the median market capitalization. Significance was found both above and below the median. For event window (-1,-1), the CAAR percentage for the smaller firms (meaning below the median market cap) was .85, significant at the .05 level ($z = 2.301$), while the larger firms yielded a CAAR of .37, significant at the .01 level ($z = 2.627$). At the time of the event, changes were evident in both the small and large firms. The small firms had a nonsignificant CAAR at -.44, while the larger firms have statistically significant returns of 1.14% (z = 3.036), indicating that larger firms are more favorably viewed as decision making adopters and are priced accordingly.

Other factors may be attributed to the differences in size, such as access to information, and will be discussed in Chapter V. Because the adopting companies varied in size and industry, additional financial metrics were used to further explore the data. Table 8 provides a summary of the descriptive financial metrics. Of the 49 companies in the analysis, 18 had historical financial information available through the Research Insight®. Of interest were the debt levels, ROEs, ROAs, and P/E ratios. The median results were: $5,704.80, 13.80, 4.05, and 19.4, respectively.

Table 8

Samples Selected for Financial Analyses

Time Frame	Sample	Debt $	ROE	ROA	P/E Ratio
Quarterly Data available surrounding event date per company ranging from 1994-2005	C1	7,003.00	3.90	1.40	36.50
	C2	6,416.00	6.60	5.00	25.20
	C3	40,523.00	9.30	2.00	19.60
	C4	504.00	57.70	14.30	21.90
	C5	2,778.00	26.30	16.30	18.10
	C6	6,836.10	26.30	10.40	24.30
	C7	4,621.00	14.50	5.00	17.80
	C8	413,396.00	13.10	1.10	11.70
	C9	4,993.60	15.50	4.00	19.20
	C10	9,873.86	14.70	3.70	20.20
	C11	1,065.00	22.20	11.40	29.10
	C12	2,063.00	8.60	4.10	33.10
	C13	1,388.00	-43.20	-4.20	1.50
	C14	1,486.00	25.20	14.60	19.10
	C15	12,410.92	10.60	4.10	58.40
	C16	758.45	6.60	2.70	11.60
	C17	31,506.00	25.20	1.80	18.60
	C18	15,592.00	7.70	2.90	11.90
Average	C1-18	31,289.66	13.93	5.59	22.10
Median	C1-18	5,704.80	13.80	4.05	19.40

Note. This table shows the descriptive financial data for the decision making adopters with available data from Research Insights.

The interpretations of this study's results are discussed in the next chapter.

CHAPTER V – DISCUSSION

The purpose of this chapter is to reflect upon the findings reported previously. As alluded to in prior studies, positive abnormal returns can be associated with a variety of management decisions. The results of this research support the use decision making tools for the enhancement of shareholder value. Clearly the results indicate that the market favorably views the adoption of the proprietary decision making approaches. To further understand the implications of this study, the results are discussed in greater detail.

Based upon the first data partition, the most significant CAARs for the entire sample occurred one day prior to the event day. These results could be explained by a term called "leakage." Often, portions of the market receive information about a particular event before it actually occurs. When this happens, share prices can be affected either positively or negatively. In the case of this study, the results are positively associated with CAAR at .52% and statistically significant at the .001 level ($z = 3.312$). It is important to note that while significance was found across all industries, the final sample sizes applied to each industry are too small to make generalizations.

The industry differences could be explained by the type of decision making tool that was analyzed. The KT decision making tool is a step-by-step deductive process assessing the current situation relative to potential alternatives by ranking them quantitatively. Their decisions related clearly identifiable, measurable processes are well suited for this tool. The electric, telecom and information technology partition and the consumer and manufacturing partition yielded the highest and most statistically significant CAARs of 1.39% and 1.17% respectively. These results may be attributed to

the type of questions that were involved in the decision making process. The highly process-oriented nature and infrastructure of industries can easily be identified and documented via process flow maps, measured using performance assessments, and physically changed. Similar to the steps involved in the decision making tool, a production environment is very logical and quantitative in nature, which lends itself to the tangible issues needing resolution in this type of environment.

Consider the following example: If our objective is to choose the best method for making widgets, then we would want to consider the factors most important in production; factors such as time, cost, quality, and capacity. Based upon these factors, we can determine an appropriate level of importance. Next we need to consider the current process we have in place for producing the widgets, machine A. Relative to the factors we are considering, machine A can produce 5 widgets per hour at a cost of $1.00 per widget and an error rate of 1 per 150 widgets. Next we compare the alternative machines. Machine B can produce 8 widgets at a cost of $2.00 per widget and an error rate of 1 per 300 widgets. Lastly machine C produces 10 widgets per hour at a cost of $5.00 per hour and an error rate of 1 per 350.

When taking all of these factors into account the best choice would be machine B as the overall cost would be $16.00 per hour to produce 8 widgets and a lower error rate than the current process. Machine C had the lowest error rate but was more costly relative to the close production capacity of machine B. Compared to a service-oriented sector, where it is more difficult to measure the products and identify the operations involved in their daily business, the consumer and manufacturing; and electric, telecom and information technology partitions should have yielded a higher return.

Another interesting difference was the variance between small and large firms. The larger firms had statistically significant positive CAARs (.37% and 1.14%) prior to the event (-1,-1) and on the event day (0, 0) respectively. This might be explained by the magnitude of measurable decisions to be made and the relative impacts of these decisions within large firms. Organizations typically strive to maximize efficiency through continual process improvement and in doing so have more opportunities to leverage decision making tools. In this study, one company in particular had extreme results. The company was a large cap conglomerate with easily identifiable and mapable processes. The CAAR results provide additional support that the decision making processes lend themselves to operationally-oriented sectors with large amounts of capital for decision making investments.

Conversely, information on small firms can be more difficult to obtain because many are not publicly traded. Even in this study, some smaller firms were excluded from the analysis due to a lack of available information. This missing information is often key in assessing managerial impacts on shareholder value. When considering the number of people involved in the decision making process, we could expect fewer decisions at smaller firms and therefore a potentially smaller impact on the shareholder value.

Overall, the results of this study offer significant contributions to the convergence of theories within cognitive psychology and the shareholder implications entwined within corporate finance. While this study expands upon works from different disciplines, future studies may seek to continue this cross-disciplinary analysis in an attempt to better understand how human decision making affects organizations, systems, and shareholders.

A roadmap for future research is offered to continue the progression of the convergence of these two disciplines (see Figure 6). By assessing decision making from cognitive psychological perspective, researchers continue to bridge the gap between human decisioning and neuron firing.

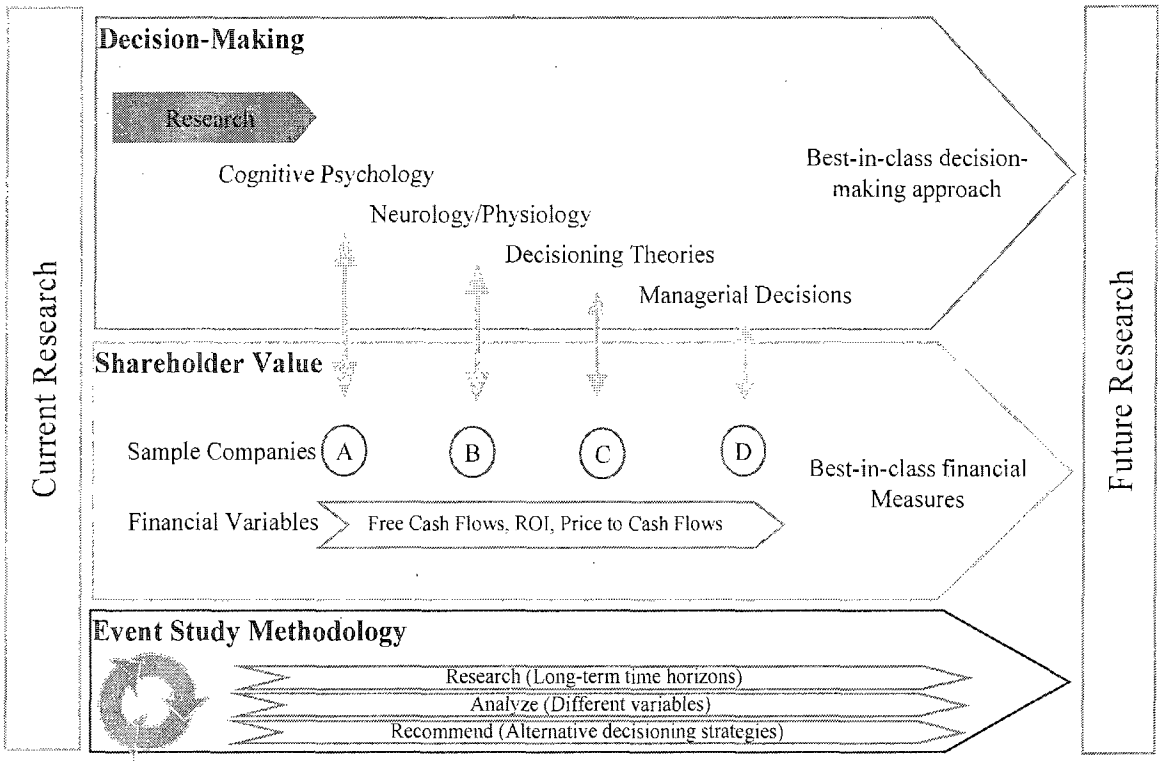

Figure 6. Roadmap for Future Research. This figure represents various avenues available for expanding upon this dissertation research, including decision making, shareholder value, and event study methodologies.

Such studies may become crucial in understanding why people make decisions in certain situations and not in others. By assessing decision making from a theoretical perspective, researchers will able to expand upon the existing theories and approaches by asking critical questions, providing expert insights, and drawing upon current empirical works. Lastly, managerial decision making can be assessed in the context of converging cognitive psychology and organizational performance. Studies utilizing psychological

assessments to identify decision making patterns and preferences could give insight into the predictive performance of the firm. These assessments would be well aligned with the decision making approaches that guided this study in that they would provide additional transparency into the minds of managers/decision makers.

A second category that would enhance research in this area is to incorporate the notion of shareholder value. By capturing snapshots of different companies during different periods of time, researchers would be able to provide sound empirical evidence for additional decision making implications. Similarly employing a variety of financial variables will enhance the realm of corporate finance from more of an intangible perspective (i.e., decision making). To conduct these psychological and financial analyses, event study methodologies can be utilized much like they were in this dissertation.

Few studies since Mahajan and Lummer (1993) have looked at this type of decision making process adoption. Particularly from a shareholder value perspective, this study is unique. From a cognitive psychology perspective the results of the study show support for the proprietary decision making processes used and the neuroscientific underpinnings leave room for greater exploration. From a corporate finance perspective this study suggests that the market favorably views the adoption of such decision making processes. To expand upon the types of event studies previously conducted, the decision making variables and financials could be assessed over a long-term time horizon. In doing so, it may be determined that rational decision making approaches can have lasting affects on shareholder value. Ultimately, a best-in-class approach to managerial decision making and sustainable shareholder value may be exploited.

One of the shortcomings of this research is the emphasis on the short-term reaction to implementation rather than a longer time-horizon assessment. While many researchers have used daily event study methodologies to examine stock price responses to corporate events, Healy, Palepu, and Ruback (1992) contend that stock market responses are positively correlated to long-term performance. Additionally, the long-term validity of abnormal returns as a proxy for implementation of proprietary decision making approaches has never been assessed.

Another shortcoming pertains to factors that contributed to limiting the scope of the investigation as (a) the number and type of companies selected due to limited available CRSP and financial data, (b) the unknown level of adoption of the proprietary decision making tool, (c) the type of decisions made using the proprietary approaches, and (d) disproportionate sample size across industries.

As these emergent limitations have been identified, future research may seek to address them using empirical methodologies. The following sets of research questions are being reviewed to conclude this study:

1. What is the relationship between managerial decision making and shareholder value?

This research identifies that a statistically significant relationship does exist between managerial decision making and shareholder value. The timing significance of the abnormal returns is consistent with prior event studies indicating that the market may have received prior notification of the adoption through "leakage." While some relationships were negative, the majority were positive, and particularly strong within certain industries.

2. What are the implications of decision making approaches on the overall value of the firm?

While the proprietary decision making tool assessed in this study is not directly compared to the overall value of the firm, a good indication of firm performance is shareholder value. Those firms creating value for shareholders are producing value for the firm overall.

3. What can be attributed to the differences / similarities across industries with regards to abnormal stock price returns?

The differences across industries were most evident between consumer and manufacturing; and electric, telecom, and information technology and the pharmaceutical firms. The biggest consideration for these results point to the deductive, quantitative process involved in the decision making process. Highly process-oriented firms are able to leverage the decision making tool more easily. While the research and development and production of the pharmaceutical products may be highly process-oriented, the rest of the operations are indefinite. The similarities across industries demonstrate the overall value that the tool perceivably can provide.

4. How does the market perceive that managers make good decisions?

Traditionally the market may have assessed managements' decision based upon a difference in financials or structural organizational changes, however the breadth and depths of the decisions made with this proprietary tool are unclear in the current study. The market does not perceive per se that managers are making good decisions, but rather that they have adopted a decision making tool enabling them to make more effective, transparent decisions. A long-term time horizon study of these adopting companies, with

a detailed account as to the type and quality of decisions made, could accurately assess how the market truly perceives good decisions.

In conclusion, a bridge has been created between assessing decision making on a financial basis and on a neuroscientific level. As financial metrics are increasingly being used to measure organizational performance, guide decision making, and gauge whether shareholder value is being created, advances in brain imaging are providing insights into the neural connections involved in these processes. To ensure that this bridge keeps spanning, cognitive psychologists, social neuroscientists, and finance researchers need to work together to build theories and sophisticated experiments that explore organizational decision making on a neural level.

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