



---

Theses and Dissertations

---

2015-04-01

## Organizational Learning in Commercial Construction: Lessons Learned from the 2007-2009 U.S. Recession

Evan Michael Danforth  
Brigham Young University - Provo

Follow this and additional works at: <https://scholarsarchive.byu.edu/etd>



Part of the [Construction Engineering and Management Commons](#)

---

### BYU ScholarsArchive Citation

Danforth, Evan Michael, "Organizational Learning in Commercial Construction: Lessons Learned from the 2007-2009 U.S. Recession" (2015). *Theses and Dissertations*. 5246.  
<https://scholarsarchive.byu.edu/etd/5246>

This Thesis is brought to you for free and open access by BYU ScholarsArchive. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of BYU ScholarsArchive. For more information, please contact [scholarsarchive@byu.edu](mailto:scholarsarchive@byu.edu), [ellen\\_amatangelo@byu.edu](mailto:ellen_amatangelo@byu.edu).

Organizational Learning in Commercial Construction

Lessons Learned from the 2007-2009

U.S. Recession

Evan Michael Danforth

A thesis submitted to the faculty of  
Brigham Young University  
in partial fulfillment of the requirements for the degree of

Master of Science

Justin E. Weidman, Chair  
Clifton B. Farnsworth  
Kevin R. Miller

School of Technology

Brigham Young University

April 2015

Copyright © 2015 Evan Michael Danforth

All Rights Reserved

## ABSTRACT

### Organizational Learning in Commercial Construction Lessons Learned from the 2007-2009 U.S. Recession

Evan Michael Danforth  
School of Technology, BYU  
Master of Science

Organizational learning seeks to proactively expand the knowledge base of an organizational entity by incorporating knowledge, skills, and experience into the collective conscience of the company through the development of routines rather than relying on individual employees for these traits. Valuable experience gained by individuals who weather economic downturn with their companies must be absorbed into the corporate structure in a meaningful way so that it may be accessible for use during future recessions. This research asks what was learned by individuals during the most recent recession, what mechanisms were employed to retain and utilize this knowledge, and what cultures, strategies, or processes were created because of it. Companies were also compared to understand whether an increase in organizational learning within a company would translate into increased performance.

Keywords: organizational learning, organizational learning mechanisms, strategy, construction, recession

## ACKNOWLEDGEMENTS

Upon completion of this research, I would like to thank the professors on my graduate committee for the time and effort they spent assisting in this work. Their advice and encouragement has been invaluable. I would also like to give a special thanks to the many industry professionals who took time out of their busy schedules to share their knowledge and experiences with me. Most of all, I would like to thank my wife and children for their love and support throughout this process.

## TABLE OF CONTENTS

<b>LIST OF TABLES .....</b>	<b>viii</b>
<b>LIST OF FIGURES .....</b>	<b>x</b>
<b>1 INTRODUCTION.....</b>	<b>1</b>
1.1 Nature of the Problem.....	1
1.2 Purpose of the Research.....	1
1.3 Research Goals .....	2
1.3.1 Organizational Learning .....	2
1.3.2 Nontraditional Reactions .....	4
1.3.3 Organizational Learning Mechanism.....	4
1.3.4 Company Comparison .....	5
1.4 Assumptions.....	5
1.5 Definitions of Terms.....	6
1.6 Limitations and Delimitations .....	7
<b>2 REVIEW OF THE LITERATURE .....</b>	<b>8</b>
2.1 Organizational Learning .....	8
2.2 Forms of Organizational Learning.....	10
2.3 Organizational Learning and Environmental Changes.....	16
2.4 Organizational Learning and Crises .....	19
2.5 General Recession Management Strategies .....	21
2.5.1 Positioning .....	22
2.5.2 Planning .....	23
2.5.3 Promoting.....	24
2.5.4 Preparing.....	25
2.6 Construction Responses to Crises.....	26

<b>3</b>	<b>METHODOLOGY .....</b>	<b>29</b>
3.1	Approach Selection: Qualitative vs. Quantitative.....	29
3.1.1	Methodology Selection .....	30
3.1.2	Methodological Requirements .....	31
3.2	Research Method Employed .....	32
3.3	Research Design .....	34
3.4	Data Collection Process .....	35
3.5	Pilot Study.....	36
3.6	Interview Questions .....	37
<b>4</b>	<b>FINDINGS .....</b>	<b>39</b>
4.1	Research Overview .....	39
4.2	General Findings.....	40
4.3	Contracting.....	42
4.3.1	Contracting – Bidding.....	43
4.3.2	Contracting – Client Relations .....	45
4.3.3	Contracting – Subcontractor Relations .....	47
4.3.4	Contracting – Diversification.....	48
4.3.5	Contracting – Marketing .....	50
4.3.6	Contracting – Other Contracting Responses .....	51
4.4	Cost-Control.....	53
4.4.1	Cost-Control – Efficiency .....	54
4.4.2	Cost-Control – Cost Reduction .....	56
4.4.3	Cost-Control – Other Cost-Control Responses.....	57
4.5	Financial.....	58
4.5.1	Financial – Pre-Recession Preparation .....	59

4.5.2	Financial – Operating Income.....	61
4.5.3	Financial – Alternative Revenue.....	62
4.6	Human Resources .....	63
4.6.1	Human Resources – Staffing Control .....	64
4.6.2	Human Resources – Morale and Loyalty.....	67
4.6.3	Human Resources – Attitude .....	68
4.6.4	Human Resources – Training.....	69
4.6.5	Human Resources – Other Human Resources Responses .....	70
4.7	Risk Management .....	71
4.7.1	Risk Management – Subcontracting Risks .....	72
4.7.2	Risk Management – Risk Identification and Mitigation.....	74
4.7.3	Risk Management – Recovery Risks .....	76
4.7.4	Risk Management – Other Risks .....	78
4.8	Investment.....	81
4.8.1	Investment – Staff Investment .....	83
4.8.2	Investment – Equipment Investment.....	84
4.8.3	Investment – Market Share Investment .....	84
4.8.4	Investment – Resource and Process Investment .....	85
4.8.5	Investment – Investment Maintenance .....	86
4.9	Organizational Learning Mechanisms .....	87
4.10	Company Comparison .....	89
<b>5</b>	<b>CONCLUSIONS AND RECOMENDATIONS .....</b>	<b>96</b>
5.1	Organizational Learning Theory.....	96
5.2	Recommendations for Company Operation during Economic Cycles.....	97
5.2.1	Recommendations for Up Markets .....	97

5.2.2	Recommendations for Start of Recession .....	100
5.2.3	Recommendations for Down Markets .....	101
5.2.4	Contracting Recommendations for Down Markets .....	102
5.2.5	Cost-Control Recommendations for Down Markets .....	103
5.2.6	Financial Recommendations for Down Markets .....	103
5.2.7	Human Resources Recommendations for Down Markets .....	103
5.2.8	Risk Management Recommendations for Down Markets .....	104
5.2.9	Recommendations for Start of Recovery .....	105
5.3	Non-Traditional Reactions.....	105
5.4	Recommendations for Future Study .....	107
<b>REFERENCES.....</b>		<b>109</b>
<b>Appendix A. ASC Conference Paper .....</b>		<b>112</b>



## LIST OF TABLES

Table 2-1: Naming Conventions Used in Organizational Learning Theory.....	11
Table 2-2: General Recession Management Strategies .....	22
Table 3-1: Pilot Study Data.....	37
Table 4-1: Contracting – Bidding Related Responses .....	45
Table 4-2: Contracting – Client Relations Related Responses .....	47
Table 4-3: Contracting – Subcontractor Relations Related Responses .....	48
Table 4-4: Contracting – Diversification Related Responses .....	50
Table 4-5: Contracting – Marketing Related Responses .....	51
Table 4-6: Contracting – Other Contracting Related Responses .....	53
Table 4-7: Cost Control – Efficiency Related Responses.....	56
Table 4-8: Cost Control – Cost Reduction Related Responses.....	57
Table 4-9: Cost Control – Other Cost Control Related Responses.....	58
Table 4-10: Financial – Pre-Recession Preparation Related Responses.....	61
Table 4-11: Financial – Income Related Responses .....	62
Table 4-12: Financial – Alternative Revenue Related Responses .....	63
Table 4-13: Human Resources – Staffing Control Related Responses.....	66
Table 4-14: Human Resources – Morale / Loyalty Related Responses.....	68
Table 4-15: Human Resources – Attitude Related Responses.....	69
Table 4-16: Human Resources – Training Related Responses .....	70
Table 4-17: Human Resources – Other Human Resources Related Responses .....	71
Table 4-18: Risk Management – Subcontracting Related Responses .....	74
Table 4-19: Risk Management – Risk Identification / Mitigation Related Responses.....	75
Table 4-20: Risk Management – Recovery Risk Related Responses .....	78

Table 4-21: Risk Management – Other Risk Management Related Responses.....	81
Table 4-22: Investment – Staff Related Responses .....	83
Table 4-23: Investment – Equipment Related Responses.....	84
Table 4-24: Investment – Market Share Related Responses .....	85
Table 4-25: Investment – Resource / Process Related Responses.....	86
Table 4-26: Investment – Investment Maintenance Related Responses.....	87
Table 4-27: Organizational Learning Mechanisms.....	88
Table 4-28: Success Indicator – Relative Profit Margin Scores .....	90
Table 4-29: Success Indicator – Future Recession Preparation Scores .....	91
Table 4-30: Success Factor – Organizational Learning Mechanism Scores.....	92
Table 4-31: Success Indicator and Success Factor – Company Comparison .....	93

## LIST OF FIGURES

Figure 2-1: Organizational Learning Process .....	9
Figure 2-2: Single-Loop Learning .....	13
Figure 2-3: Double-Loop Learning.....	14
Figure 2-4: Defensive Reasoning Impedes Double-Loop Learning .....	16
Figure 4-1: Organizational Learning Response Categories .....	41
Figure 4-2: Contracting Related Response Categories .....	43
Figure 4-3: Cost-Control Related Response Categories .....	54
Figure 4-4: Financial Related Response Categories .....	59
Figure 4-5: Human Resources Related Response Categories.....	64
Figure 4-6: Risk Management Related Response Categories.....	72
Figure 4-7: Investment Related Response Categories .....	82

## **1 INTRODUCTION**

### **1.1 Nature of the Problem**

Valuable experience is gained by individuals who weather economic downturns with their companies. If this experience is not absorbed into the company's organizational structure in a meaningful way, it may be inaccessible for use during future market downturns. As with most industries, construction is cyclical. As general economic conditions worsen, demand for construction services decreases, causing insolvency, job loss, and economic drain. Without adequate preparation, the subsequent recovery can be equally detrimental. As companies with reduced operational capacity and capital attempt to meet the increasing demands for their services, the lack of cash flow and qualified personnel can lead to insolvency, poor performance, or loss of market share. Current practices in the construction industry do not appear to have improved the industry's outlook during hard times. Organizational learning can incorporate the individual knowledge, skills, and experience gained during such difficult times into the organizational structure of the company. Companies need to retain these lessons-learned and employ them prudently to better withstand future economic upheaval.

### **1.2 Purpose of the Research**

The purpose of this research was to identify what organizational learning occurred in U.S. commercial construction companies in response to the 2007-2009 U.S. recession. A

categorized list of the cultures, strategies, and processes created to incorporate the individual lessons learned into the organizational structure of the companies was gathered and evaluated to determine which were most effective in improving the companies' situations during the recession and preparing them for success in the following recovery.

### **1.3 Research Goals**

With regard to the commercial construction industry during the period of time surrounding the 2007-2009 U.S. recession, this study focused on four research goals; discover and record what organizational learning occurred (what lessons were learned and what strategies were developed as a result), note any unique or non-traditional reactions to the recession that were used, document what organizational learning mechanisms were employed by the companies studied, and lastly, compare companies performance to theorize whether there is a correlation between organizational learning and company performance.

#### **1.3.1 Organizational Learning**

This research identified what organizational learning occurred in response to the 2007-2009 U.S. recession. Organizational learning, as discussed in the following chapter, occurs in two stages.

The first stage is individual lessons learned. Organizations, having no cognitive processes, cannot learn in and of themselves. This must occur on the individual level before it can be incorporated into the organization (Love et al. 2000). The first research goal encompassed this first stage of organizational learning by asking what lessons were learned by individuals.

The second stage of organizational learning incorporates the individual lessons learned into the organizational structure of the company so that they may be analyzed, retained, or employed as is required for the company's improvement. This is achieved through the development of cultures, strategies, and processes (Love et al. 2000). Culture is the environment created within the company that either fosters or hinders individual and organizational learning. Strategies are the plans and frameworks set out by the organization in an effort to attain improved performance. They include plans to attain, internalize, and retain knowledge. Processes are the rules, procedures, conventions, forms, techniques, or other ways of doing things created from the attained knowledge and put in place to improve performance. Cultures, strategies, and processes "are independent of the individual actors who execute them and are capable of surviving considerable turnover in individual actors" (Levitt and March 1988).

The cultures, strategies, and processes which were created, modified, or discontinued as a result of the recession were evaluated and organized into one of six categories:

- Contracting related organizational learning: Approaches used by contractors in exploring every possible avenue of obtaining work.
- Cost Control related organizational learning: The techniques used by companies to reduce company overhead and project cost during the recession.
- Financial related organizational learning: Company efforts to improve its financial position in preparation for, and during the recession.
- Human Resources related organizational learning: lessons learned or reinforced during the recession in regards to companies' personnel.

- Risk Management related organizational learning: Actions or conditions that interviewees identified as risks to the well-being of the company, as well as strategies or actions taken to avoid or mitigate these risks.
- Investment related organizational learning: Company tactics to use the recession as an opportunity for company advancement.

The organizational learning documented was organized into a set of general guidelines or recommendations for company operation during economic cycles. The periods included were times of good economic activity (referred to as up markets), periods of poor economic activity (referred to as down markets or recessions), and the transition periods between them (entering a recession or recovery).

### **1.3.2 Nontraditional Reactions**

Many of the cultures, strategies, and processes identified had similarities across the range of respondents interviewed. This information was important in identifying which cultures, strategies, and processes were used and how effective they were. An additional goal of this research was to identify those which were not widely used, but proved to be effective. Though nontraditional or counterintuitive, they provided perceived benefits. Identifying these outliers provided possible alternatives for companies to access in the face of future economic downturns.

### **1.3.3 Organizational Learning Mechanism**

Organizational learning mechanisms are the processes, cultures, or programs that a company employs, whether formally or informally, to collect, analyze, store, or disseminate knowledge throughout the company. This research identified what organizational learning

mechanisms were employed by the companies studied. A comprehensive list of organizational learning mechanisms used was created. Companies were given an organizational learning mechanism (OLM) score for use in company comparisons, based upon the number and level of organizational learning mechanism employed in the company.

#### **1.3.4 Company Comparison**

Companies self-reported on their profit margins and expected future recessionary success relative to past profit margins and success. These scores were used as success indicators and were compared to the potential success factor of organizational learning. OLM scores were compared to success factor scores in an effort to identify potential correlation. This correlation was used to determine whether or not organizational learning within a company was related to its performance during a recession.

#### **1.4 Assumptions**

- The economic recession of 2007-2009 forced commercial construction companies to change their business practices. Companies judged the effectiveness of the cultures, strategies, and processes developed, and retained or abandoned them as needed.
- Adapted business practices of commercial construction companies helped them withstand the recession.
- Data collected through semi-structured interviews provided adequate information to gauge the effectiveness of cultures, strategies, and processes. It was assumed that information gathered may have been tainted with the memory lapses that occur over time



and with personal bias. For this reason, qualitative research methods were employed in this research as they acknowledged and accounted for such bias.

## 1.5 Definitions of Terms

This research was oriented toward the useful application of organizational learning. As such, it used unifying themes in organizational learning research that could be applied in a real-world setting when general consensus could not be found through a study of literature on the subject. Since the strict definitions of many organizational learning terms were still unsettled amongst researchers, the most practically applicable definitions were used in this research.

- Economic Recession: Two or more consecutive quarters of falling Gross National Product. This period is also referred to as a down market or down cycle in this research.
- Up Market / Up Cycle: These terms refer to periods of good economic performance.
- Learning: The acquisition of knowledge or skills through experience, study, practice, teaching, imitation, or other means that allow an individual or organization to imbibe said knowledge or skills.
- Organizational Learning: The process by which organizations acquire and utilize knowledge.
- Strategy: “[T]he direction and scope of an organization over the long term: which achieves advantage for the organization through its configuration of resources within a changing environment to meet the needs of markets and to fulfill stakeholder expectations” (Price et al. 2003).

- Process: The method of performing work in an organization as established by that organization's explicit regulations and implicit norms. Processes are created to fulfill an organizational strategy, they are performed in accordance with the culture of the organizations members.
- Culture: The values, norms, and goals of the organization and its members that affect how they carry out processes. Organizational culture can reinforce or contradict, correct or exacerbate member culture.

## **1.6 Limitations and Delimitations**

- This research addressed only commercial construction companies in the Southwest United States.
- OLM scores and Success Factor Scores are derived from self-reported data. These scores are not sufficient to prove any potential theories. Rather, they are used identify general trends and correlations in the data.

## 2 REVIEW OF THE LITERATURE

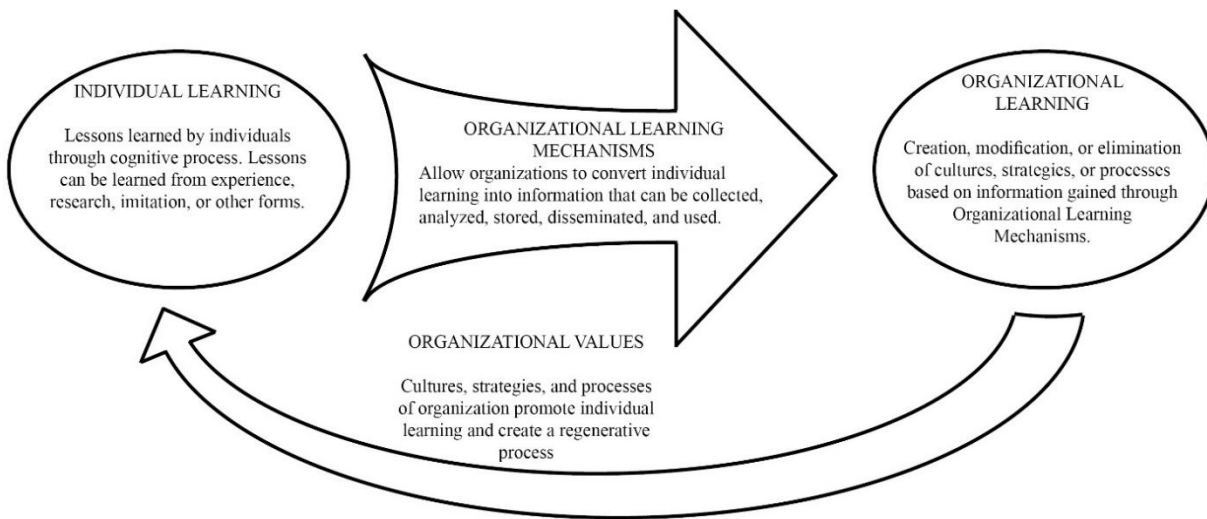
### 2.1 Organizational Learning

At its most basic definition, organizational learning describes the process by which organizations acquire and utilize knowledge. Though numerous studies focus on organizational learning, it has remained an ambiguous term (Love et al. 2000). Theoretical discussions of organizational learning have led to multiple definitions and examples, but little empirical data. The multiple definitions can be condensed into two general schools of thought on organizational learning. Phillips noted that “the first [school of thought] views organizations as anthropomorphic entities that actually integrate individual learning and translate it into action for the organization’s benefit; the second is concerned with the identification of behavior which inhibit or disable individual learning” (Chan et al. 2005). The former, though theoretically interesting, suffers from the incongruence of attributing the human capacity of learning to a non-human entity. The latter describes an organization in which individuals learn without transmitting that knowledge to the organizational level. Maintaining knowledge at an individual level runs the risk of that knowledge being lost, misinterpreted, or underutilized.

Lipshitz provided a convenient marriage of the two by suggesting “that learning by organizations occurs when individual learning... occurs within the context of Organizational Learning Mechanisms that ensure that people get the information they need and that the products of their reflections are stored and disseminated throughout an organization” (Chan et al. 2005).

Organizational Learning Mechanisms are described by Lipshitz, Popper, and Oz as “institutionalized structural and procedural arrangements that allow organizations to systematically collect, analyze, store, disseminate, and use information that is relevant to the effectiveness of the organization” (Lipshitz et al. 1996).

Organizational learning differs from individual learning, but cannot occur without it. An organization, of itself, cannot learn. Learning takes place within the minds of individuals. As demonstrated in Figure 2-1, organizational learning takes place when the culture, values, and processes of the organization encourage individual learning, then collect and disseminate their newly acquired knowledge throughout the company. This transformation from specific individual knowledge to general company knowledge creates a learning organization rather than a collection of learning individuals (Love, et al. 2000).



**Figure 2-1: Organizational Learning Process**

Learning of an organization has traditionally been an organic process that involves the natural development of cultures, strategies, and processes as a response to the requirements

imposed on the organization by its environment. Behavior within an organization, and in fact the very construction and operation of organizations, is founded on these three general elements. They are independent of the individual actors who execute them and are capable of surviving considerable turnover (Levitt et al. 1988). Cultures, strategies, and processes are evaluated, whether formally or not, based on their perceived success in assisting the organizations in reaching its goals. Those that are deemed to have been successful helping the organization achieve its goals are retained within the organization. They are captured in a way that makes the lessons accessible to organizations and organizational members who have not themselves had the experiences that resulted in the knowledge, often in the form of new or modified procedures. Those that are deemed failures, in that their use did not produce the targeted end result, are generally discarded (Levitt et al. 1988).

## **2.2 Forms of Organizational Learning**

Organizational learning is often categorized into two main forms. These forms are described by different researchers in different terms, but the terms are substantially similar. Bennet referred to these two different forms as adaptive and generative. Adaptive learning allows the organization to do better than it is currently doing, but generative learning “challenges and redefines the basic requirements of the task and how they should be undertaken” (Chan et al. 2005). Fiol and Lyles used the terms Behavioral Learning and Cognitive Learning. “[Behavioral] Learning can be viewed as ‘new responses or actions based on existing interpretations.’ Cognitive Learning refers to the continuous review and modification of ways of working for performance improvements” (Wong et al. 2012). The terms used in this research are single-loop and double-loop learning. Single-loop learning incorporates the essence of adaptive

and behavioral learning, while double-loop learning sufficiently covers the implications of generative and cognitive learning. Theoretical researchers may argue that combining disparate terms, regardless of their similarities, oversimplifies a complex phenomenon. However, Lipshitz, Popper, and Oz, when attempting to incorporate organizational learning principles into practical application found one of their greatest obstacles to be the “inability... to translate the metaphors that compose [their] vision of a learning organization into operative (and hence meaningful) tasks that team members could own and perform” (Lipshitz 1996). As this study was meant to collect and analyze data on the practical application of organizational learning, usable definitions were required. These definitions have been outlined in Table 2-1.

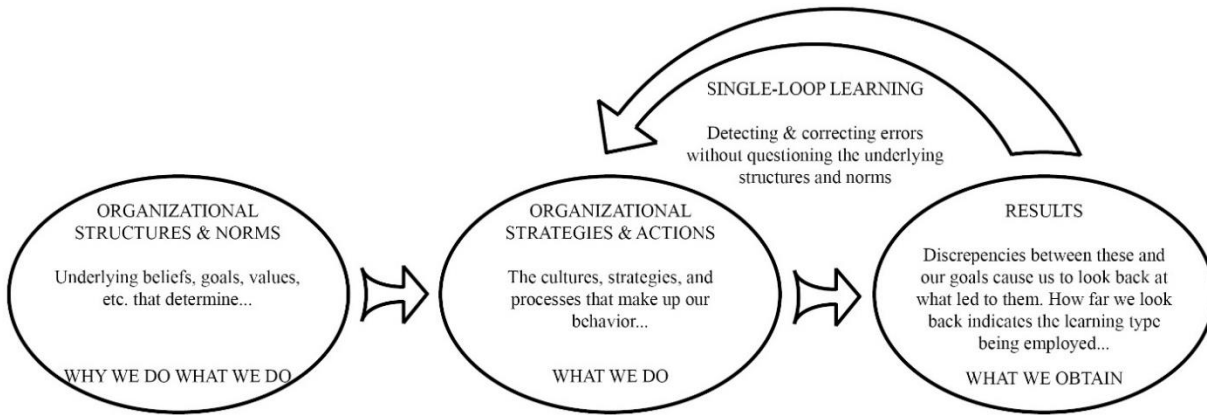
**Table 2-1: Naming Conventions Used in Organizational Learning Theory**

RUDIMENTARY FORM OF LEARNING		ADVANCED FORM OF LEARNING	
NAMING CONVENTIONS	IMPROVEMENT PROCESS	NAMING CONVENTIONS	IMPROVEMENT PROCESS
Adaptive Learning	Allows organizations to improve by detecting and correcting errors without questioning the organizational structures and norms that may have initiated them. New responses or actions may be created, but they are based on existing organizational frameworks	Generative Learning	Continually reviews and modifies the ways of working for performance improvements by challenging and redefining the basic requirements of the task and how they should be undertaken. Scrutinizes and modifies the underlying norms or structures in an organization that may be leading to errors or deficiencies.
Behavioral Learning		Cognitive Learning	
Single-loop Learning <sup>A</sup>		Double-loop Learning <sup>A</sup>	
A: Naming Convention to be used in this research.			

Single-loop learning detects and corrects errors without questioning the organizational structures and norms that may have initiated them. It may be considered as a preparatory or initial form of Organizational Learning. Single-loop learning is often characterized by working under a set of clearly identified project goals and interpreting feedback on the success of

achieving those goals based on past experience (Wong et al. 2012). This approach was the most commonly used in business at-large and even more so in the construction industry. It is shown visually in Figure 2-2, adapted from (Single-Loop and Double-Loop Learning Model 2012). It is advantageous in that it fits conveniently into the current corporate structure. Its execution is straightforward; find problems and fix them. Single-loop learning is able to improve the organization's performance and knowledge base without requiring drastic changes to the culture of the organization. There are three significant weaknesses to single-loop learning:

- The errors corrected may only be symptoms of greater underlying problems with the existing organizational norms, but these are not questioned (Love et al. 2000).
- The process of acquiring knowledge in this manner does not allow the organization's knowledge to change rapidly with its environment. Since the environment continues to change as the knowledge is processed, the knowledge attained or strategy created may no longer meet the requirements of the environment. It is at this point that unlearning may need to occur in order to achieve double-loop learning (Wong et al. 2012).
- Single-loop learning is not a self-sustaining process. There is no built-in system of continuous learning or improvement. Single-loop learning is initiated when a problem occurs and ends when that problem is perceived to be fixed (Love et al. 2000).



**Figure 2-2: Single-Loop Learning**

Double-loop learning scrutinizes and modifies the underlying norms or structures in an organization. Argyris and Schone stated:

[C]hanging beliefs and routines are preconditions for organizations to improve by developing new strategies. Double-loop Learning refers to a change of performance improvement actions taken after reviewing the need to change the underlying assumptions that have caused errors or deficiencies (Wong et al. 2012).

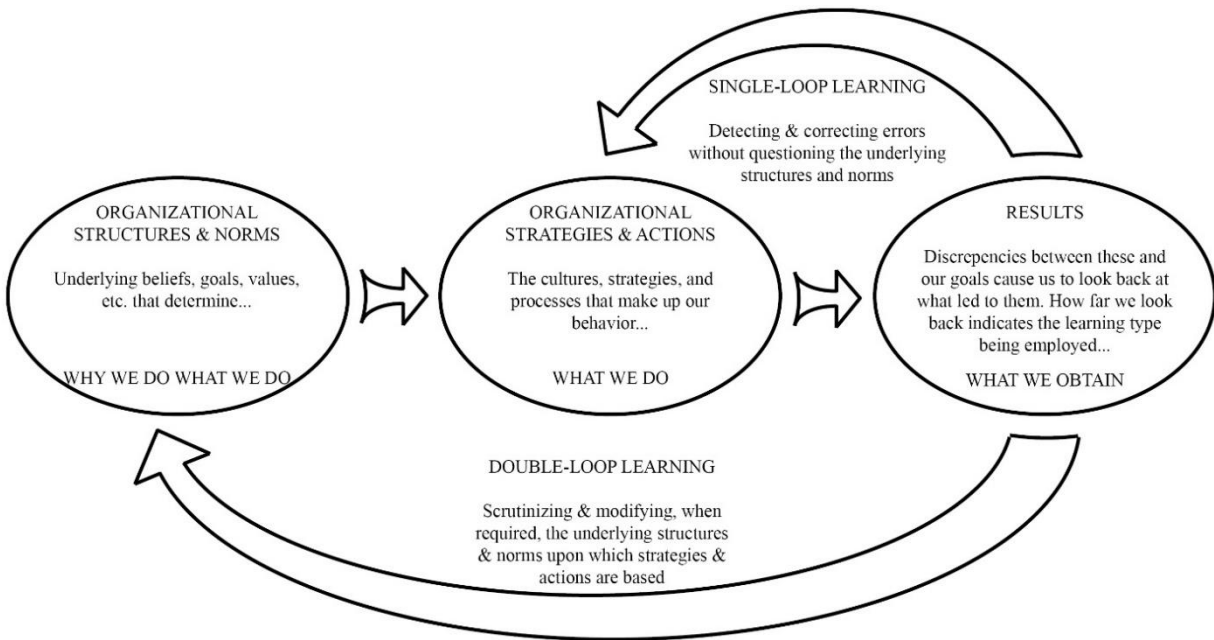
Further:

Double-loop learning activities are manifested in the form of paradigm shifts of organizational protocols, technology, operation, and culture as a precursor for effective and efficient construction business processes (Kululanga et al. 2002).

As demonstrated in Figure 2-3, adapted from (Single-Loop and Double-Loop Learning Model 2012), Double-loop learning identifies the root of a problem before taking improvement action; it seeks and adopts new management and working approaches through the evaluation of current practices (Wong et al. 2012). It is self-sustaining in that “[t]he processes are designed for continuous responsiveness, ongoing learning, and the use of feedback loops to fuel future decisions” (Love et al. 2000). Variables for double-loop learning include: measuring of business



processes, climate of openness, commitment of leadership to learning, rewarding innovations, building a shared vision, use of systems thinking, encouraging personal mastery, and encouraging mental modeling (Kululanga et al. 2002).



**Figure 2-3: Double-Loop Learning**

The following example was put forth as an example to practically apply the principles of single and double-loop learning in construction:

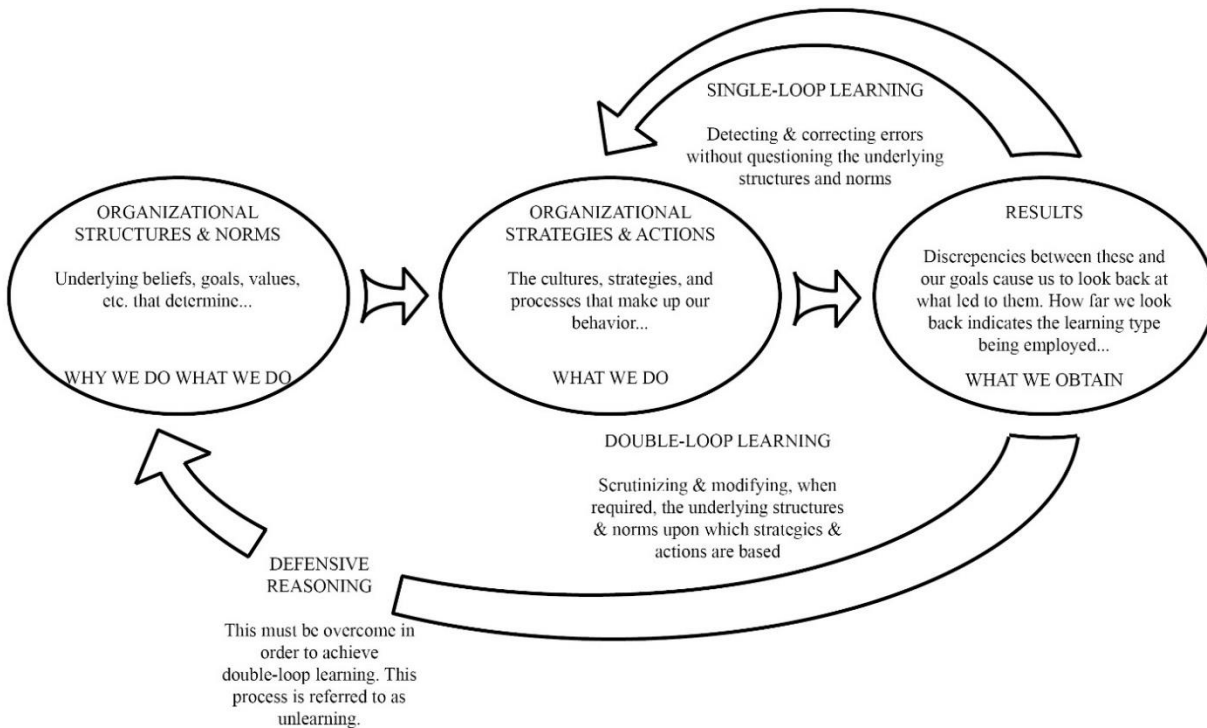
[A] contractor who regularly undertakes design and construct projects may repeatedly incur additional costs due to design errors for particular trade types, and may use this knowledge and experience gained to include a contingency in future contracts for potential design errors. Continuing with such a practice in the short term may be profitable, but in the long term this action may have detrimental effects on the contractor’s ability to deliver projects to their client’s satisfaction (Love et al. 2000).

Such an example illustrates a potential application of single-loop learning. Using double-loop learning in the same situation may include the following.

[If] we assume the contractor selected consultants on a competitive fee basis and that the fee reflected the quality of the work they undertook, then it may be assumed that a higher fee could result in less errors being experienced. However, a higher fee may not necessarily improve the quality of documentation as this will depend on the designer's experience, the availability of resources and the workload of the design firm. Thus, on reflection of current work practices, the contractor could change its approach to procurement by implementing a prequalification system to select design consultants whom they consider to have the skills base and capacity to provide a quality service (Love et al. 2000).

Single-loop learning solves the immediately recognized problem; however, without performing Double-loop learning the solution may only treat the visible symptom rather than the root problem. Double-loop learning continually reviews the underlying principles or assumptions to verify that optimal solutions are achieved at the root of a problem or inefficiency.

Practicing Double-loop learning has been shown to have a greater impact on performance than Single-loop learning, yet most organizational learning exhibited in construction is Single-loop learning (Wong et al. 2012). This is thought to occur because “not many organizations are capable of learning in an introspective manner... [They] rarely accept an operational change that does not fit their core values” (Wong et al. 2012). This protective attitude towards existing core values is sometimes referred to as defensive reasoning. Figure 2-4, adapted from (Single-Loop and Double-Loop Learning Model 2012), illustrates this principle. Double-loop learning requires that old knowledge, beliefs, cultures, or routines be removed or changed as they become obsolete, a process called unlearning. The routines of a company have been developed over a long period of time, and discarding or changing them may be difficult. As such, most construction entities do not achieve double-loop learning (Wong et al. 2012).



**Figure 2-4: Defensive Reasoning Impedes Double-Loop Learning**

### 2.3 Organizational Learning and Environmental Changes

The rate and type of technological change in an industry are the result of environmental dynamics acting on that industry. A host of environmental factors put pressure on firms to generate and implement innovations (Arditi et al. 1997).

During the recession such factors included reduced budgets and fees, increased competition for work, reduced manpower, increased subcontractor default, and other risks. As the environment changes, successful companies will follow. Proactive companies may even change in anticipation of environmental change. Buckler states that an organization must have a capacity to learn that exceeds the rate of change imposed by the external environment in order to be successful (Love et al. 2000). Therefore, in a static environment, incremental single-loop learning may be sufficient for the continuous improvement and success of an organization.

However, a rapidly changing environment may force or facilitate radical change, potentially enabling double-loop learning.

Three different types of environmental changes are observed in the management of organizations; Operational changes, competitive changes, and strategic changes (Lansley 1987):

- Operational changes have predictable outcomes and do not lead to any permanent changes in the relationship between the firm and its environment. Routine pre-programmed responses based on previous experience are able to handle these changes. These environments allow firms to focus on improving their routine systems, procedures and skills.
- Competitive changes, which are long-term and subtle, leading to changes in the structure of the industry and in relationships between the firm and its environment. These changes must be adjusted to in the long term, but do not require an immediate response. They require greater emphasis on creating systems and procedures which can develop slowly in harmony with incremental changes in the environment, and ensuring that skills are updated regularly and appropriately.
- Strategic changes are sudden and unexpected. They are unprecedented and outside the experience of the firm. Such changes require rapid and creative responses and necessitate the development of new relationships with the environment. Strategic changes in an environment necessitate organizational systems which can support the creativity and responsiveness needed to generate new concepts of business and service.

Operational change has too often been the emphasis of organizations, focusing on internal processes while paying insufficient attention to the external environment. This has led most planning to be short term (focused on specific projects) rather than long term (focused on

the goals of the company). An overdependence on operational planning exposes companies to potential financial distress, misallocated resources, loss of competitiveness, and lack of growth. (Dansoh 2005) Successful companies are able to go beyond planning for operational change, and have formal plans for competitive change, hence their success. However, as indicated by the failure of ostensibly successful companies during the recession, many are unprepared for strategic change. It is this type of environmental change in which companies in the U.S. found themselves in during the recession of 2007-2009.

The U.S. recession, as formally defined by two or more consecutive quarters of falling Gross National Product, officially began in December of 2007 and ended in June of 2009. Though the recession ended in 2009, many of the statistics that describe the U.S. economy remained under their pre-recession values or worsened after that date. The national unemployment was at 5.0% in Dec. 2007, rose to 9.5% at Jun. 2009, and peaked after the official end of the recession at 10.0% in Oct. 2009. In the worst quarter since the data series began, the January through March of 2009 recorded a net decrease of 63,000 establishments. February of 2009 recorded 3,059 mass layoffs involving 326,392 workers. (Hadi 2011) This climate of change, though generally considered detrimental to business, created an environment ripe for organizational learning.

The prerequisites for organizational learning to happen include situations where employees experience a common sense of direction of how their company must transform to survive now and in the future (Kululanga et al. 2001).

Schumpeter noted:

[A] long-term downswing in economic activity... brought with it a pressure on industries and firms to reorganize and rationalize. Such dramatic changes are necessary in order that industries might reach the effectiveness necessary for them to adopt those innovations

and value systems which will contribute to the next prolonged upswing in economic activity, for some, in order to remain in business (Lansley 1987).

## 2.4 Organizational Learning and Crises

Lipshitz, Popper, and Oz identified four preconditions that may support or encourage organizational learning.

First organizations that operate in unstable and competitive environments need to improve continuously to survive. Hence these organizations... invest considerable resources in learning mechanisms that allow them to stay ahead in their fields... Second, organizations in which the cost and salience of errors are high are motivated to learn to avoid such errors (Lipshitz et al. 1996).

These preconditions are copiously satisfied by the nature of the construction industry and the environment created by recessions. Given these two conditions one could hypothesize that a great deal of organizational learning occurs in the construction industry. However, the third and fourth conditions may either support or undermine that hypothesis. They are “third, organizations with a leadership committed to learning invest considerable resources in developing OLMs [Organizational Learning Mechanisms]” (Lipshitz et al. 1996), and fourth, the professionalism of the organizational members. Though professionalism involves numerous attitudes and attributes, “an important criterion by which professionals are evaluated (particularly among peers) is the extent to which they keep abreast of the state of the art in their fields” (Popper et al. 1998). It is these latter two preconditions, leadership and professionalism, that often make the difference between a learning and a stagnant organization.

Though environmental factors play a large part in recession era management, leadership which has planned for such an event can find opportunities in such turmoil. In a recent study on recession era management, Pearce and Michael noted:

[P]erhaps the most important implication of our findings for theory is that recession-induced declines in the market value of resources not only create new threats, they provide important new opportunities. Recessions generate both an operating effect and a strategic effect. The operating effect is that the decline in resources affects our firm; the strategic effect is that the decline affects all firms. By being better able to conserve, maintain, and attract resources relative to competitors during recession, and to deploy those resources to capture customers, competitive advantage can be built (Pearce et al. 2006).

Studies conducted by both McKinsey & Company and Boston Consulting Group further confirm this.

[Though] around a third of the companies in the first quartile of their industries tumbled from their perches during the 2000 slowdown... 15% of today's market leaders vaulted to the top during that recession (Williamson et al. 2009).

An example of such organizational learning can be found in a study by Linsu Kim focusing on Hyundai Motors. This study advises that organizations can only learn at the rate of their absorptive capacity, and that absorptive capacity has two major elements: prior knowledge base and intensity of effort. Hyundai Motors sought to increase its knowledge base through education, personnel movement, acquisitions, and imitation. Hyundai Motor then sought to increase its intensity of effort through the use of crises. These crisis came in the form of externally evoked crises such as the oil crises of the 1980's, or internally manufactured crises such as manufacturing goals that were considered unattainable for the company's current level of development. These crises were used to spur the organizations learning ability and advance its standing among worldwide automobile manufacturers from an assembler of Ford compact cars in 1967 to producing its own model in 1994 (Kim 1998). This suggests that though a crisis may force change upon an organization, a formal organizational learning plan can shape that change to create a positive outcome.

## 2.5 General Recession Management Strategies

Recession era strategies have been formulated and studied by numerous researchers. Such research has identified the need to improve upon traditional strategies.

Increasing global competition has made business survival more difficult than before. Under the new conditions, many of the old ways of dealing with recessions or downturns cannot work; they may even debilitate the firms using them (Bigelow et al. 1992).

More specifically:

Traditional advice from the business press on how to manage through recession has been straightforward: reduce expenses in any possible way. But, in a recession, strategies implemented to facilitate a business's short-term relief are often the precipitators of its long-term pain. Reducing R&D expenses, reducing customer service, and laying off employees may have the desirable effect of improving near-term results, but they increase the likelihood of permanent damage to competitive advantage and market share growth (Pearce et al. 2006).

The most successful method of combating a recession is proactively planning for one. Plans for cutting costs and divesting of excess inventory should be in place and ready to implement when monitoring of the business environment foresees an oncoming recession. The existing goal of cost cutting should be accompanied by the additional goals of protecting market share and positioning the company to be highly competitive for the upcoming recovery (Bigelow et al. 1992). Though researchers have identified various potential strategies to better cope with recessions, these strategies are best encompassed in the four step process of positioning, planning, promoting, and preparing (Pearce et al. 2006) as shown in Table 2-2 below.



**Table 2-2: General Recession Management Strategies**

GENERAL RECESSION MANAGEMENT STRATEGIES				
POSITIONING		PLANNING	PROMOTING	PREPARING
DIVERSIFICATION	CORE STRATEGIES			
Spreading risk throughout multiple markets: Geographic areas, demographics, multiple industries, cyclical and countercyclical services	Avoid diluting resources into less lucrative businesses by divesting of all but core businesses	Prudent retrenchment strategies activated by predetermined triggers. These include conserving cash flow and reducing non-essential assets.	Marketing, customer service, R&D, and similar operations can attract value conscious customers, reducing the effects of customer loss and increasing market share	Judicious investments during a recession can increase capacity, market share, and the acquisition of technologies, materials, or personnel at reduced cost

### 2.5.1 Positioning

Positioning involves spreading risk throughout multiple markets. This may include doing business in many different geographic areas, targeting different demographic customers, or branching into multiple industries. One study indicates that building is a cyclical industry while remodeling and maintenance is counter-cyclical. Companies that perform both services may be able to switch between the two during cycles of recession and recovery (Pearce et al. 2006). In positioning, companies must choose between diversification and core strategies. Major companies with competitive advantages in growing field may not want to dilute their resources into other, possibly less lucrative businesses, and would pursue a core strategy. Minor players in with few competitive advantages in stagnant or decreasing fields would pursue a diversification strategy. As most companies fall in between these two extremes, careful analysis and decision making must be used to choose the correct course of action (Bigelow et al. 1992).

## 2.5.2 Planning

Planning for declining sales includes a contingency of retrenchment and recovery that is activated when predetermined triggers in losses, sales, or cash flow are reached. Retrenchment encompasses conserving cash flow through cost and asset reduction. Recovery directs the remaining resources to their highest potential value (Pearce et al. 2006).

[Such retrenchment] strategies buy time, [but] they are not likely to foster sustainable competitive advantage. [A] relative cost advantage is an important dimension of competitiveness, [but] history suggests that focusing solely in cost reduction during a downturn rarely results in superior long-term performance (Reeves et al. 2009).

An analysis of public companies in the 1980-82, 1990-91, and 2000-02 recessions concluded that firms that cut costs faster and deeper than rivals have the lowest probability (21%) of emerging ahead of competition in recovery (Gulati et al. 2010).

Once a company has taken defensive measures needed to survive during the downturn, it is then in a position to contemplate the future and to take the measures needed to thrive during the upturn (Reeves et al. 2009).

The study found:

[A company that] deploys a specific combination of defensive and offensive moves has the highest probability (37%) of breaking away from the pack. These companies reduce costs selectively by focusing more on operational efficiency than their rivals do, even as they invest relatively comprehensively in the future by spending on marketing, R&D, and new assets. Their multipronged strategy... is the best antidote to a recession (Gulati et al. 2010).

Positioning and planning may be seen as more defensive strategies meant to protect a company from undue harm during a recession. Promotion and preparation comprise these more offensive moves.

### 2.5.3 Promoting

Companies often abandon promotion and marketing during recession to achieve short term cash flow. This short-term gain can hinder the long-term success of the company. Cost reductions in customer service, advertising, manufacturing/servicing, and R&D should be done judiciously. Inefficiencies in these services should be removed rather than reducing the companies' ability to perform these services. Some researchers even advocate increasing many of these services, when possible, in order to increase market share over companies that are decreasing these services (Bigelow et al. 1992). Studies indicate that companies with limited or no reduction in marketing fared best during recessions. A study of recessionary strategies employed by companies in the PIMS (Profit Impact of Market Strategy) Database was conducted to determine which costs should be increased and intensified, which should be reduced during recession and which cost are case specific. The costs were categorized based on the return on capital employed during recession, the change in return on capital employed during the first two years of recovery, and the change in market share during the first two years of recovery. The research concluded that investments in marketing, customer-perceived quality and value vs. competitors, and R&D product development were costs that should generally be increased and intensified (Roberts 2003).

Marketing campaigns may be more successful during recessions; as other companies cease marketing activities, a successful campaign may be had at a more competitive price and may face less competition for the attention of customers. R&D and the introduction of new products of services may benefit from the same phenomenon. As competitors cease these operations, new products and services face less competition for the attention of customers searching for greater value. This search for value suggests that overt price cuts as a method of

coping with recession may be counterproductive, as price cuts may suggest to the consumer a reduction in quality. Alternatives to explicit price cuts are price reductions hidden in bundled services and private labeling (a possible equivalent of self-performed work in the construction industry). Such actions can attract new customers searching for value in the recession that will offset, at least partially, the loss of existing customers (Pearce et al. 2006).

#### **2.5.4 Preparing**

Businesses frequently survive the depths of the recession only to fail during the recovery because they have not adequately prepared. The increase in demand that accompanies a recovery mandates sufficient cash flow to finance the investments required to meet this demand. Without sufficient growth, companies cannot meet demand and will lose market share to competitors that can. These required investments can be made at a much more competitive price during the recession. Growth through acquisition and expansion may be more economical as there is little competition and values have decreased. Retention and training of skilled employees is vital during this time (Pearce et al. 2006).

Companies which have cash in hand and low debt ratios are in a position to invest in efforts to grab market share that their cash poor, high debt competitors may not be able to defend against. The market share that these companies pick up in a recession is likely to remain theirs in good times. In addition, those companies with available cash can negotiate better prices and delivery dates than those companies which are not paying cash up front. This will allow these companies to reduce costs even further. Recessions also offer firms the opportunity to pick up top notch talent from their competitors, as employees can generally be coaxed to switch companies rather than risk layoffs at their present locations. Finally, managers can find investment opportunities that simply do not exist in good times. Companies can purchase carefully selected businesses at bargain basement prices as panicked companies attempt to sell assets in order to raise cash (Bigelow et al. 1992).

It is important to note that these investments must be made judiciously, as they may reduce vital cash flow when it is most needed.

## **2.6 Construction Responses to Crises**

A study by Lim, Heng, Oo, and Ling, of contractors' responses to prolonged recession in Singapore from 1997 to 2005 divided the responses into three categories: Contracting-related strategy, Cost-control related strategy, and Financial- related strategy. Contracting-related actions were the approaches used by contractors in exploring every possible avenue of obtaining work. The top two contracting-related actions were bidding for more projects that were within the firms' resources and capabilities, and setting size limitations on projects undertaken at which the failure of one project would not endanger the firms' operations. All companies interviewed in the Lim study adopted the following Cost-Control related actions: Stricter site management to reduce material wastage; stricter financial managements on the company's cash flow; and stricter procurement measures. The main Financial-related actions were to set aside contingency funds from the companies' reserves, to opt for alternative loan services to finance debts and increase working capital, and a reduction in purchasing of machinery and office equipment. Some companies revealed that their investment portfolio provided a second source of income for the firm (Lim et al. 2010).

Tansey, Meng, and Cleland performed a literature review of response strategies adopted by construction companies during economic recession. Their research encompassed most eminent academic journals of construction and project management in circulation. The response strategies found were then categorized using Porter's generic strategies. "Porter's model is a well known theoretical framework among business strategists and industrial economists" (Tansey et

al. 2013). The three generic strategies in this framework are differentiation strategies, cost leadership strategies, and focus strategies. Differentiation is concerned with providing a unique product or service so as to stand out in the face of high competition. Such strategies include investing in R&D, increasing marketing, and increasing the services offered. Cost leadership strategies involve cost reduction, such as cutting salaries, reducing budgets, and laying-off employees. Focus strategies indicate whether to focus on particular market segments or the entire industry. Though the review found differentiation strategies to be the most frequently written about in journal articles, the related case studies by the same authors found cost leadership strategies, specifically cutting bonuses, employing staff on a project by project basis, and retraining staff on ways to reduce costs, to have been the most used. Though the review indicated that “differentiation is the one that helps firms survive economic turbulence,” and “in times of excessive competition... differentiation has a stronger relationship with performance” (Tansey et al. 2013), the most used strategies involved cost reduction. Such an example is indicative of the construction industry’s inability to convert individual learning (that of academic research) into organizational learning that can be practically applied for performance improvement.

A 1986 study by Wong and Logcher on contractor’s behavior in cyclical economic environments compared firms’ relative market performance with their operational variables (behavioral characteristics). It came to specific conclusions about what firms should do to succeed in different economic environments based on a statistically significant correlation between behavior and performance. The study determined that to prepare for bad times construction companies should move into new market areas, try new methods and technologies for improving productivity, and improve safety records. During bad times the critical operational variables were effectiveness of project planning and control, and effectiveness of marketing. In

good times effectiveness in project planning and control, effectiveness of marketing, and increased subcontracting were found to be the most important (Wong et al. 1986). The study's findings on what to do to prepare for good times is perhaps the most enlightening.

[T]he research study by Wong indicates that the technical efficiency of contractor's declines in good times and the results of the interviews show that the major reason for such decline is the shortage of skilled labor (Wong et al. 1986).

In other words, the efficiencies learned in the recession are not converted from individual learning to organizational learning in the form of cultures, strategies, and processes that can survive turnover of personnel.

Such studies highlighted the difficulties that the construction industry has in adequately transposing the lessons learned, whether by internal employees or external researchers, into organizational learning that could be used to improve performance. The strategies indicated to be the most effective during a recession were often not those most frequently used during the recession. The research in this thesis performed a similar study of coping strategies for economic cycles, but it gleans data from interviews with industry professionals rather than from academic journals. Furthermore, this thesis focused on organizational learning as a method of bridging the gap between individual and organizational learning so that companies may better analyze and create their own strategies. As such, this research compared company performance to organizational learning mechanisms rather than to strategies employed. Though this research also created set of recommendations for behavior during different economic cycles, the ultimate goal of this research was to improve the organizational learning within individual companies to improve their ability to create their own unique guidelines and strategies specific to their circumstances.

### 3 METHODOLOGY

#### 3.1 Approach Selection: Qualitative vs. Quantitative

Research approaches generally fall into one of three main categories: Qualitative, Quantitative, and a combination of the two. Qualitative research is generally exploratory, with unknown variables and lack of theory base.

For qualitative studies, the research problem needs to be explored because little information exists on the topic. The variables are largely unknown, and the researcher wants to focus on the context that may shape the understanding of the phenomenon being studied. In many qualitative studies a theory base does not guide the study because those available are inadequate, incomplete, or simply missing (Creswell 1994).

Quantitative research involves problems that have been previously studied by other researchers to the point that clearly defined variables and theories already exist and can be tested.

Concepts, variables, and hypotheses are chosen before the study begins and remain fixed throughout the study... One does not venture beyond these predetermined hypotheses (Creswell 1994).

Each method has distinct benefits and limitations. It is for this reason that a combination of methods has been used.

The effectiveness of [combined methods] rests on the premise that the weaknesses in each single method will be compensated by the counter-balancing strengths of another (Jick 1979).



Combining methods attempts to “improve the accuracy of their judgments by collecting different kinds of data bearing on the same phenomenon” (Jick 1979).

Given the exploratory nature of the problem under study, Qualitative Research Methodology was determined to be best suited for the bulk of the data collection. The research sought to answer questions as to the actions, or reactions, of construction companies in economic recession. Though quantitative information may have been used in making these decisions and in attempting to gauge their effectiveness, the interpretation of this information and the value placed on said interpretation was subject to the various biases of the decision makers. Further, the environments in which these decisions were made, or the perception of the environment, differed between decision makers. The multiple variables, and the personal biases or perceptions which affected or interacted with these variables advocated the use of qualitative research methodology. Further, the lack of previous studies directly on this topic, the lack of consensus of theories derived from these studies, and the need to explore the topic by interacting with the subjects precluded the exclusive use of quantitative research methodology. In order to compensate for the weaknesses and biases inherent in qualitative methodology, the data was corroborated using quantitative Lickert Scale questions in the interviews.

### **3.1.1 Methodology Selection**

Though many method types exist in qualitative approaches to research, Creswell identifies four main types; Ethnographies, Grounded theory, Case studies, and Phenomenological studies. Ethnography involves the researcher studying an intact cultural group in its natural setting over an extended period of time. Though studying a construction company in its natural setting during the recession would have been illuminating, such a study was infeasible for this

research. Case studies have been done on construction companies and projects, and have proven useful, but they do not provide the wide ranging data that is desired for this study.

Phenomenology is concerned with the study of experience from the perspective of the individual, it is based in a paradigm of personal knowledge and subjectivity (Lester 1999). Such a method would prove useful in the study of individual learning, but does not translate well to organizational learning.

Grounded theory is a general methodology for developing theory that is grounded in data systematically gathered and analyzed. Theory evolves during actual research, and it does this through continuous interplay between analysis and data collection (Strauss 1994).

In Grounded Theory, theory may be elaborated, modified, or initially generated from the data attained through the research. This approach to creating theory satisfied the goals of this research. This research started with questions that needed to be answered by the data rather than theories or hypothesis that were tested through the data. Without preconceived theories, it was requisite that theory, that is to say the answer to these questions, be based, or grounded, in the data collected. As more data was collected, these theories were modified, elaborated upon, or even abandoned as the data dictated. Given the nature of the problem, it was determined that Grounded Theory was best suited to address the research goals.

### **3.1.2 Methodological Requirements**

The number of respondents necessary for accurate Qualitative Research Methodology has not been specified, though they are typically smaller for qualitative work than for quantitative. Interviews may be conducted until the saturation point, the point at which no new information is received and responses become repetitive, is attained. Brikci and Green estimated this point at approximately fifteen respondents for any homogeneous group. Homogenous groups contain

members that share a key demographic variable that is likely to impact their view of the topic such as age, gender, or skill (Brikci et al. 2007). Attaining a broad list of strategies from specific homogeneous groups required that Stratified Purposeful Sampling be used. Stratified Purposeful Sampling selects respondents to ensure that certain preselected parameters or demographics are included in the study (Sandelowski 2000). Stratification is the process of dividing members of a sample population into homogeneous groups for sampling. Purposeful, rather than random, sampling allowed for the pre-selection of variables such as company type, company size, geographic location, position of respondent within the company, etc. To ensure that appropriate variation occurs within a sample, a sampling grid may be created based on “key demographic variables that are likely to have an impact on participants’ view of the topic” (Brikci et al. 2007).

Purposeful sampling also made it possible to locate respondents based on availability and willingness to participate in the study. Though every effort was made to select a varied population of respondents, practical limitations dictated that the sample population be made up of companies and individuals with some direct or indirect connection, however small, that the researcher was able to leverage into voluntary participation in the study. This was not thought to affect the reliability of the study as the kind of sampling used is considered informationally, rather than statistically, representational (Sandelowski 2000). The results of the study were not meant to be used to make statistically accurate assumptions about the general population, but were meant to be used as a source of information about the population.

### **3.2 Research Method Employed**

The purpose of this research was to identify what lessons were learned in U.S. commercial construction companies during the most recent recession, and how that individual

learning was converted to organizational learning. As this study focused on learning, rather than statistical evaluations of performance, qualitative interviews were conducted. Subsequently, the research relied on the views and opinions as expressed by the representatives of the studied firms. To counteract potential bias or misinformation, a stratified-purposeful-sampling survey was conducted including participants in various roles within the organizations. Conducting interviews with multiple participants of varying positions within a company, and comparing the results of those interviews, reduced the potential for personal bias to cloud the study and allowed for an evaluation of how well the lessons-learned by individuals were incorporated into the company. The interview questions consisted of both open-ended and Likert scale questions. Open-ended questions allowed for a wide variation in experiences, while the Likert scale questions introduced a quantitative base of information.

Studies on recession business strategies and their effectiveness have been conducted in other industries and across the business world as a whole. The most empirical of these studies used hard data gained from the financial documents of the companies studied to allow for a statistical evaluation of performance (Roberts 2003). With few firms willing to offer up their financial records for study, strictly empirical research was ruled out. Furthermore, the quantitative evaluations of behavior performed in such studies were unable to incorporate the qualitative aspects of learning. For example, the study mentioned previously on contractor's behavior in cyclical economic environments was frequently required to supplement its statistical findings with information gained from qualitative interviews (Wong et al. 1986).

This research sought to create a broad list of cultures, strategies, and processes which were developed. Variation in the responses was expected and not discouraged. Identifying non-traditional and infrequently used cultures, strategies, or processes was a goal of the research and

may have been hindered by an attempt to reach consensus. An accurate accounting of the company's behavior, without influence from knowledge of other companies' responses, was required. For this reason, only one round of interviews per respondent was conducted, rather than multiple rounds as prescribed in other methods. This research gathered data on lessons learned, organizational learning mechanisms employed to incorporate them into the company, and its effect on company performance using both quantitative and qualitative methods.

### **3.3 Research Design**

A sampling grid composed of geographic locations and employee positions across multiple companies was created in order to ensure maximum variation among respondents. The employee positions chosen were Company Management (presidents, CEOs, Vice presidents, and project executives), Project Management (senior project manager, project managers), Preconstruction Management (estimators, senior estimators, and preconstruction managers), and Labor/Field Management (superintendents and senior superintendents). Each management group constituted a homogenous group. Given the rule-of-thumb of fifteen respondents per homogenous group to reach a data saturation point, fifteen companies were chosen with four respondents per company, each corresponding to a different management group, for a total of sixty respondents (Brikci et al. 2007).

Fifteen companies did not give a large enough sample size to represent the entire United States, so one geographic region became the focus of the study. This research focused on the Mountain Division of the West Region as set forth by the United States Census Bureau. (Regions and Divisions 2014). The decision was made to include California in the study as it borders the Mountain Division and shares a substantial number of business

connections; many construction companies based in the Mountain Division have offices in California and vice versa.

- West Region
  - **Mountain Division: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming**
  - Pacific Division: Alaska, **California**, Hawaii, Oregon, and Washington

Within the division mentioned, efforts were made to contact companies that varied in both geographic location and size. Though the basic categories of geographic location, company size, type of construction, and respondent position were preset into the research, new categories appeared as the research progressed.

Alternatively, in a qualitative methodology inductive logic prevails. Categories emerge from informants, rather than are identified a priori by the researcher. This emergence provides rich ‘context-bound’ information leading to patterns or theories that help explain a phenomenon. The question about the accuracy of the information may not surface in a study, or, if it does, the researcher talks about steps for verifying the information with informants or ‘triangulating’ among different sources of information, to mention a few techniques available (Creswell 1994).

### **3.4 Data Collection Process**

The data was collected through a series of semi-structured interviews. These semi-structured interviews included specific questions to be answered, but allowed for follow-up questions and clarification. Companies were chosen from the membership rolls of the Associated General Contractors in order to assist in finding reputable companies. Companies were chosen to include variations in geographic location and firm size in monetary volume of work done annually. The constant requirements for the research were that the firm must perform the majority of its work as general contractor (rather than subcontractor), must be based in the

Mountain Division or California, and must perform the majority of its work in commercial construction. Interview responses were recorded and transcribed for accuracy.

### **3.5 Pilot Study**

A pilot study was performed by conducting semi-structured interviews with senior management of three Utah based commercial construction companies. Data and feedback from these interviews were used as a basis for the interview questions used in the main study. The responses were sorted and categorized based on whether they were a lesson learned or a culture, strategy, or process created from the lesson. The number of respondents that mentioned the particular lesson was also noted. These result were assembled in Table 3-1 below. Though preliminary, they gave a satisfactory preview of the type of information that was gained from semi-structured interviews. They also demonstrated an oversight in the questions asked. Though the cultures, strategies, or processes created, as well as the lessons that preceded them, were identified, the Organizational Learning Mechanisms used to link the two were not. This issue was remedied with the insertion of question 1.5: What systems, programs, or culture (If any) does your company use to get feedback from employees?

The information from this pilot study was further analyzed in greater detail and published in an ASC Conference paper entitled Organizational Learning in Utah Commercial Construction during Economic Recession. This paper is included in this research in Appendix A.

**Table 3-1: Pilot Study Data**

PILOT STUDY RESPONSES		
Response Types	Response Rate	Responses
Lessons Learned	3	Diversity in countercyclical client base, industries, and regions reduces risk
	3	Expenses must be reduced to stay competitive
	3	Plan for the Recovery
	2	Employee loyalty is tested and must be reinforced - Engaged employees increase efficiency
	2	Subcontractors are essential to staying competitive
	1	Do not do no-profit work - Risks are too high for no reward
Cultures, Strategies, Processes	2	New offices opened
	1	Federal, industrial, & mining portfolios developed
	1	Field Training, Project Oversight, and Accountability Reports increased to improve efficiency and reduce waste
	1	Made strategic investments while costs are low
	1	Maintained Capacity through no-profit work
	1	Poached talent while they are most available
	1	Maintained efficiency through accountability programs and culture
	1	Time & money investments in estimating increased
	1	Staff reductions planned through encouraged attrition rather than layoffs
	1	Key Employees retained regardless of workload
	1	Company mission/vision solidified to encourage employee buy-in
	1	Team building, camaraderie, and personnel development exercises increased
	1	Invested in improving subcontractor relations
	1	Prequalified and vetted subcontractors to protect against default
	1	Used Subguard or similar insurance
1	Reserve capacity for profitable jobs	

### 3.6 Interview Questions

The following are the interview questions used throughout this research. As this research used semi-structured interviews, additional follow-up and clarification questions were asked on an individual interview basis.

#### Part 1: Interview Questions

1.1 What business lessons were learned in attempting to improve your company's outlook during the 2008-2009 U.S. recession?

1.2 Why was this approach successful?



1.3 What strategies did you try that were not successful (If any)?

1.4 How have these changes affected your company during the recovery?

1.5 What systems, programs, or culture (If any) does your company use to get feedback from employees?

1.6 On a scale of 1-10, 1 being significantly worse and 10 being significantly better, how are your company's profit margins now as compared to before the recession?

1      2      3      4      5      6      7      8      9      10

1.7 On a scale of 1-10, 1 being significantly worse and 10 being significantly better, how do you feel that your company is positioned for future recessions because of these changes?

1      2      3      4      5      6      7      8      9      10

1.8 Do you have any other lessons, or advice, that you feel would be pertinent to research on lessons learned from the recession?

## Part 2: Background Information

2.1 Type of Company (public vs. private):

2.2 Type of Work Most Often performed (Commercial, Residential, Civil, Industrial)

2.3 Annual Revenue

2.4 Year Company was founded:

2.5 Job Title:

2.6 Years of experience interviewee has in construction industry:

2.7 Years of experience interviewee has with his/her current company:

## 4 FINDINGS

### 4.1 Research Overview

The following is a compilation of the results of the Grounded Theory method research conducted using semi-structured interviews. The interviews were conducted in fifteen different companies or divisions spread across the southwest United States as discussed in Section 3.3 – *Research Design*. The researcher interviewed four companies based in Southern California, four Arizona companies, one Colorado based company, five companies based in Utah were interviewed, and one Nevada based company was interviewed. Within each company, interviews were conducted with an individual involved in company management, an individual involved in project management, an individual involved in preconstruction, and an individual involved in labor/field management. Three of the companies interviewed delegated preconstruction services to one of the other interviewees, either upper/company management personnel or project management personnel. This resulted in a total of fifty-seven interviews being conducted.

A pilot study of the upper management of the three Utah firms was conducted in August through October of 2014. All other interviews were conducted over a three month period between November 14, 2014 and January 30, 2015. Interviews were conducted over the phone or in person. They were recorded and transcribed for accuracy, and their contents were analyzed and categorized for this research. For the purpose of this research, companies were assigned random numbers 1 through 15 so that the data, once extracted from the transcribed interviews,

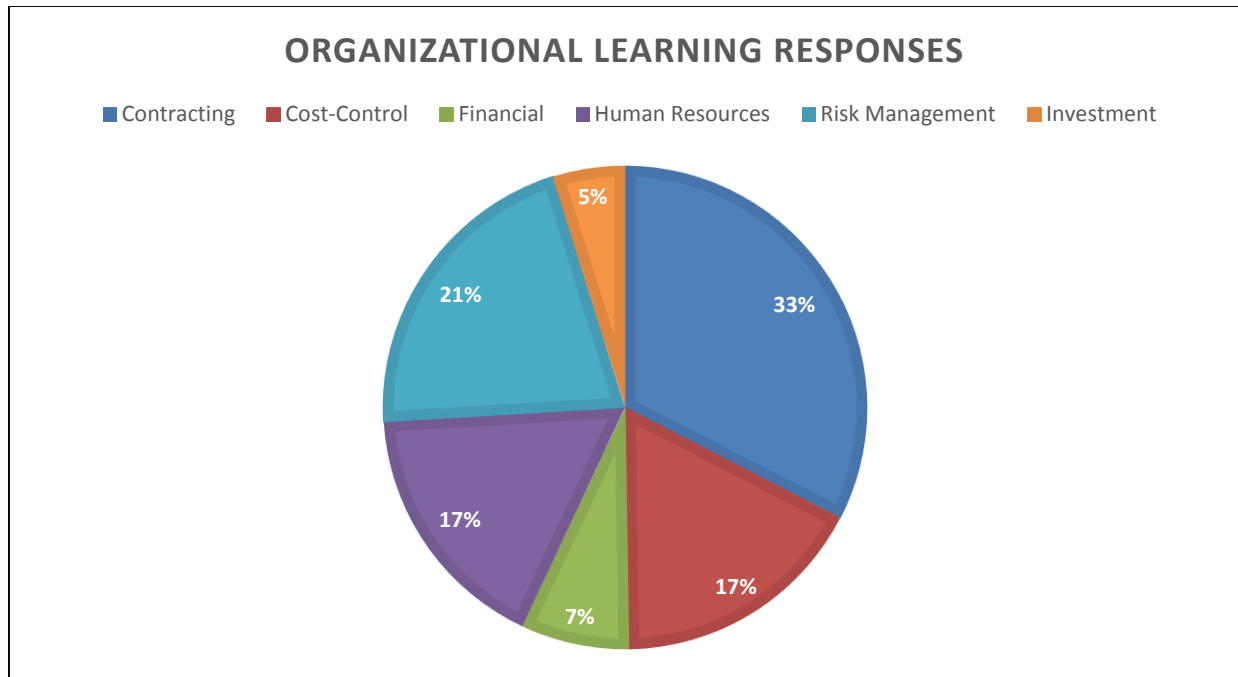
could be analyzed separately from the company identity. Information was collected and analyzed throughout the interview process. As the research progressed, trends in the data and potential theories began to emerge. The following data represent the final information and theories derived from all five rounds of interviews.

Company sizes ranged from \$25 million to \$800 million in yearly revenue, with the mean being approximately \$300 million and the median being \$250 million. Company ages ranged from 8 years to 106 years, with the mean being approximately 64 years and the median being 61 years. The average years of experience that company management interviewees had was approximately 28 years, with the median being 25 years. The average years of experience that project management interviewees had was approximately 20 years, with the median being 17 years. The average years of experience that the preconstruction interviewees had was approximately 18 years, with the median being 17 years. The average years of experience that the field/labor management interviewees had was approximately 23 years, with the median being 20 years.

## **4.2 General Findings**

The research uncovered a total of 567 responses. These included lessons learned or reinforced during the recession, and strategies implemented (for the sake of brevity, the term ‘strategies’ in the following data refers to any cultures, strategies, or processes created in response to the lessons learned). Similar responses were grouped together, creating a total of 117 unique responses. The responses were categorized into six main groups; Contracting, Cost-Control, Financial, Human Resources, Risk Management, and Investment. These include the three categories previously used to classify construction responses to recession (as mentioned in

Section 2.6 – *Construction Responses to Crises*), with the addition of three supplementary categories to more accurately capture the areas covered. The distribution of the responses is shown below in Figure 4-1.



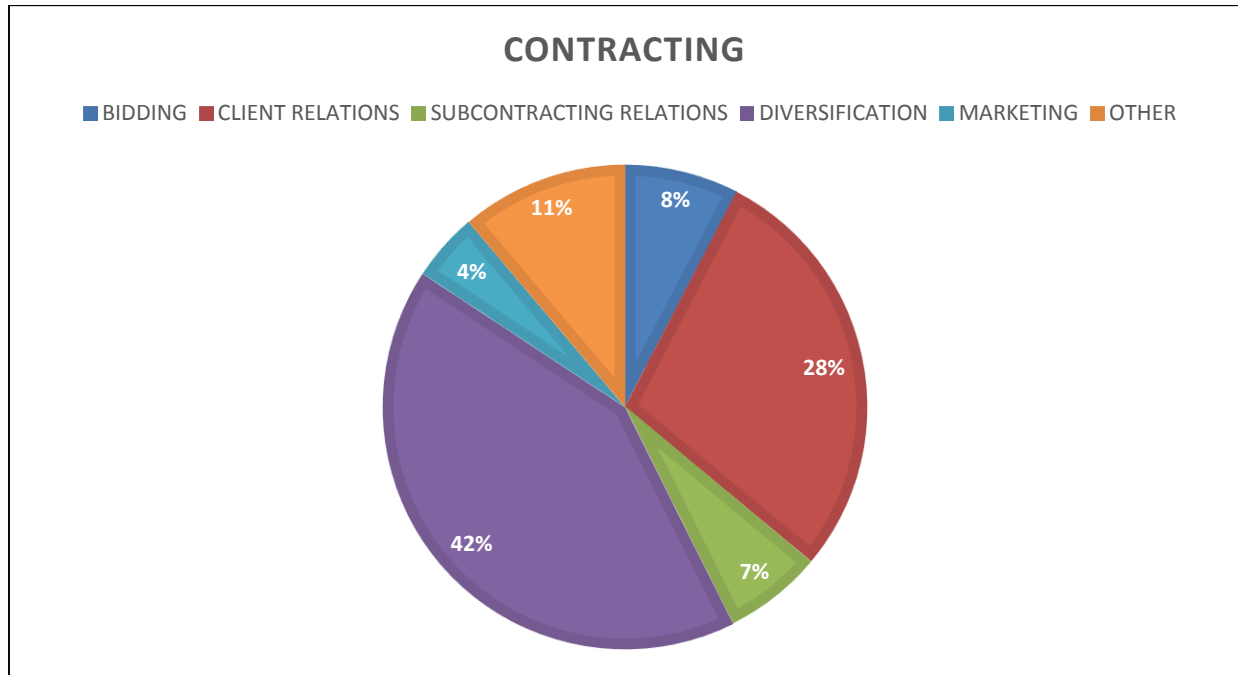
**Figure 4-1: Organizational Learning Response Categories**

As shown, the most common responses to recession were Contracting related at 33% of total responses. Risk Management followed at 21% of responses. Cost-Control and Human Resources related responses were the third most common at 17%. 7% of responses were Financial related, and Investment related responses were the least common at 5%. This suggests that the primary concern of companies during the recession was finding and winning work. It is disappointing, yet anticipated that Investment in the recession was the least mentioned category. This is consistent with past research that suggests the lack of organizational learning in the construction industry does not provide companies with sufficient knowledge and innovation to

use the recession as an opportunity rather than a threat. Instead, construction companies are forced to make difficult cuts and adjustments to cope with economic recession, as will be further described in the following sections.

### **4.3 Contracting**

Contracting related actions were approaches used by contractors in exploring every possible avenue of obtaining work. The Contracting related responses were further divided into six subcategories for more detailed analysis; Bidding, Client Relations, Subcontracting Relations, Diversification, Marketing, and Other contracting related responses as shown in Figure 4-2. The most common subcategory area was the need for diversification at 42%, followed by the importance of client relations at 28%. The least mentioned subcategory was marketing at 4%. The following subsections detail the responses mentioned in these subcategories. Each subsection contains a table detailing the individual responses of the interviewees, the number of interviewees that mentioned a particular response, and whether that response was a lesson learned or a strategy implemented.



**Figure 4-2: Contracting Related Response Categories**

#### 4.3.1 Contracting – Bidding

Bidding comments made up 8% of Contracting related responses and 2.5% of total responses. These comments are shown below in Table 4-1. The lesson learned or reinforced in bidding is that there is greater competition for work in a recession. There are generally fewer jobs available. The available jobs are often put out to public hard-bid as owners seek to take advantage of the recession by exploiting reduced prices. This often leads to a significant increase in the number of companies vying for a project and a decrease in that project’s potential profits. The strategies mentioned are responses to the increasingly competitive environment created by the recession. Of these strategies, the most mentioned was the need to invest in preconstruction. Three interviewees mentioned that their companies, rather than reduce the preconstruction department in order to reduce overhead, increased investments in preconstruction to find new or

creative ways to reduce project costs in order to win jobs. Along the same lines, two respondents stated that they increased their investments in technology to win work. These responses included using BIM as a presentation tool to demonstrate potential cost savings to the owner through clash detection, prefabrication, and other project coordination. Other respondents mentioned reducing or eliminating company profits on self-performed work or on entire projects as a strategy used to reduce project costs sufficiently to win work. Though this approach was effective at reducing bids, it may have significant repercussions, especially in a prolonged recession. Though three interviewees mentioned this strategy, nine interviewees counselled against it in Subsection 4.5.2 – *Financial – Operating Income*. Additionally, in Subsection 4.7.4 – *Risk Management – Other Risks* five respondents mentioned that bidding too low for a project was a substantial risk.

The most unique response was the refusal to enter any public hard-bids. Two respondents mentioned that their companies chose to maintain a policy of performing work only at a negotiated fee. One interviewee mentioned that because of this policy, his company experienced a year and a half without winning any work. This respondent stated that the company's profit margins were significantly higher than competitors because of this strategy, but there were drawbacks. The main drawback to this course of action was the extreme reduction in manpower the company experienced as a result. Though this decision may have made financial sense, the human resources cost of such a course of action may deter companies from using it. This cost is outlined in Section 4.6 – *Human Resources*.

**Table 4-1: Contracting – Bidding Related Responses**

<b>BIDDING</b>		
<b>Response Type</b>	<b>Response Rate</b>	<b>Responses</b>
<b>LESSONS</b>	5	Greater competition for jobs
<b>STRATEGIES</b>	3	Invest in preconstruction
	2	Bid jobs at no profit
	2	Invest in new technology to win work
	2	Do not enter public low bids <sup>A</sup>
	1	Bid self-performed work at no profit
A: Entering public low-bids requires an increase in overhead in order to prepare a competitive bid, but the success rate and profit margins for these types of jobs do not justify the required overhead.		

### 4.3.2 Contracting – Client Relations

Client Relations comments made up 28% of Contracting related responses and 9.3% of total responses. The comments are shown below in Table 4-2. Respondents learned the importance of client relations in finding and winning quality work during the recession. They also learned that these relationships can become strained due to the financial hardships experienced by both parties. Clients may choose not to build during recession because of lack of finances, or they may choose to put projects out for hard-bids rather than negotiating a fee with a known contractor. This forced contractors to become more competitive on cost and schedule, which in turn seems to acclimatize owners to this demanding new reality. Respondents mentioned that owners were not only more demanding on cost and schedule during the recession, but that this attitude continued into the recovery.

Strategies to cope with this new reality included performing smaller or riskier projects (projects the company normally would not pursue) in an effort to develop or maintain a



relationship with an owner. Though smaller and riskier projects that did not demonstrate a potential for future relationships were pursued during the recession out of necessity, they were cautioned against. Respondents emphasized that many projects were won at too low a price as compared to their inherent risks during the recession. Projects with potential for future work provided an ancillary benefit that compensated for their risk. Though these projects may not have provided immediate or significant returns with regard to company profits, the relationships that they developed provided future financial returns.

Respondents also mentioned their companies' attempts to educate clients about the benefits of treating construction as a service rather than a commodity. As a commodity, construction may be thought of as a product that will be produced identically by any party. In that instance, it would behoove a client to seek the lowest possible initial price for this commodity. As a service, contractors can negotiate for work on the premise that they provide superior service or quality than their competition.

Interviewees also mentioned the need to be willing to expand their client base to survive in a recession. This involved seeking out new and potentially unfamiliar clients, which provided its own inherent risks. Performing work for an unfamiliar client was listed as a significant risk by two respondents in Subsection 4.7.4 – *Risk Management – Other Risks*. One interviewee claimed that his company's most severe losses during the recession came from working with unfamiliar clients. Rather than work for unfamiliar clients because existing clients were unable to fund their projects, one respondent mentioned efforts to assist clients with project creation. This strategy is outlined in Section 5.3 – *Nontraditional Reactions*.

**Table 4-2: Contracting – Client Relations Related Responses**

CLIENT RELATIONS		
Response Type	Response Rate	Responses
LESSONS	20	Client relations are important <sup>A</sup>
	15	Clients change strategies in recession – moving to hard bids or not continuing to build
	5	Owners are more demanding on cost and schedule during and after recessions
STRATEGIES	8	Perform smaller/riskier work for clients to maintain or start a relationship
	4	Educate clients on benefits of negotiated delivery systems – Construction as service vs. commodity
	3	Be willing to work for new/unfamiliar clients
	1	Facilitate project creation through relationships with financial institutions and reduced/free preconstruction services
A: Familiarity with the client, the quality of the client, whether they are a client that continues to building during a recession, whether they are a client that will continue to negotiate work rather than move to a hard bid delivery system.		

### 4.3.3 Contracting – Subcontractor Relations

Comments regarding Subcontractor Relations made up 7% of Contracting related responses and 2.2% of total responses. The comments are shown below in Table 4-3. The majority of information about subcontractor relations can be found in other sections (See Subsection 4.7.1 – *Risk Management – Subcontracting Risks*). However, several respondents specifically mentioned the importance of subcontractor relations in finding and winning work. Respondents revealed that they sought a pricing edge from subcontractors so as to give them an advantage in winning a project. Interestingly, two respondents mentioned that assisting subcontractors, both financially and in company management, during the recession benefited their contracting efforts. The rationale put forth for this strategy was the importance of referrals from, and resumes of, highly quality subcontractors in finding and winning new work.

**Table 4-3: Contracting – Subcontractor Relations Related Responses**

SUBCONTRACTOR RELATIONS		
Response Type	Response Rate	Responses
LESSONS	9	Subcontractor relations are important
STRATEGIES	2	Seek a pricing edge from subcontractors
	2	Assist subcontractors that have been hurt by the recession

#### 4.3.4 Contracting – Diversification

Diversification related comments made up 42% of Contracting responses and 13.6% of total responses. The comments are shown below in Table 4-4. It is interesting to note that diversification was the most commonly mentioned recession coping strategy with eighty-two individual responses. Interviewee learned that markets, both market sectors and geographic regions, were affected differently during the recession. By carefully choosing the markets in which to work, companies were able to minimize their risk in the recession. Diversifying markets, clients, or regions *during* the recession was often mentioned, but this was often noted to be a necessity rather than choice. Respondents stated that entering new and unfamiliar markets, client types, or regions included inherent risk and may result in failure. Companies with no resume or familiarity with a certain market, client, or region were generally unsuccessful in finding negotiated work in these new areas during a recession. To enter these new areas, companies were often forced to enter public low-bids. Winning public low-bids frequently required companies to reduce or completely eliminate profit margins and contingencies. Interviewees whose companies had diversified significantly *before* the recession stated that their diversity made them more successful during and after the recession. Companies with diverse

resumes before the recession were able to shift resources into those markets, clients, or regions that maintain or increased demand during the recession. This did require companies to be structured in a flexible manner so as to be able to make these shifts without accruing undue overhead costs. Shifting resources was noted to be more successful when the staff was appropriately diverse in order to remain competitive and productive as they are shifted to new markets, clients, or regions.

Some companies actually made a point to diversify into countercyclical markets or clients in preparation for recessions. Countercyclical markets or clients are those that, due to their nature, increase or maintain demand during a recession. For example, government work generally increases in recessions due to governmental programs to improve the economy through economic stimulus, in addition to the desire to take advantage of reduced construction costs during the recession. Other countercyclical markets mentioned were public and federal work, mining, industrial, tenant improvement and remodels, multi-family housing, and educational work. Though mining and industrial work fall outside the scope of this study on commercial construction, they provide another interesting option for countercyclical diversification. A similar strategy was described by one respondent whose company diversified into countercyclical client types rather than countercyclical markets. This respondent mentioned that his company experienced increased construction of commercial buildings for a client which sold mining and industrial equipment. As precious metals and natural resource prices rose during the recession, the client's revenue and business increased to the point of requiring additional work and retail space, which the commercial contractor was able to provide.

**Table 4-4: Contracting – Diversification Related Responses**

DIVERSIFICATION		
Response Type	Response Rate	Responses
LESSONS	3	Markets are affected differently during recessions
STRATEGIES	19	Diversify markets during recession <sup>A</sup>
	13	Diversify markets prior to recession
	8	Diversify staff resumes/skills
	7	Open new offices/divisions to capture new markets or regions during recession
	7	Company flexibility
	6	Diversify geographic regions during recession
	4	Diversify into countercyclical markets prior to recession
	3	Diversify into countercyclical markets during recession
	3	Plan/position for recession in up economy
	3	Diversify geographic regions prior to recession
	3	Pursue new project sizes or types
	2	Diversify clients prior to recession
	1	Diversify into countercyclical client types during the recession
A: Of the respondents that mentioned this strategy, three also mentioned that they attempted but failed in this strategy due to lack of resume and familiarity in the new markets.		

#### 4.3.5 Contracting – Marketing

Marketing comments made up 4% of Contracting related responses and 1.5% of total responses. The comments are shown below in Table 4-5. As mentioned in Subsection 4.4.2 – *Cost-Control – Cost Reduction*, some companies eliminated or reduced marketing in an effort to cut overhead in the recession. This strategy was in direct conflict with research indicating that investments in marketing should generally be increased and intensified during a recession (Roberts 2003). However, respondents did mention that maintaining the company’s brand and

reputation during a recession was vital. With increased competition already reducing revenues and profit margins, a damaged brand or reputation would have exacerbated an already difficult situation. Strategies to maintain the companies' brand and reputation included maintaining project quality standards and verifying that subcontractors did likewise, and refusal to lower prices beyond a certain point so as not to give the impression of desperation or lower quality. One respondent also indicated that his company moved some resources to their charitable wing during the recession. Though the underlying reason for this move may not have been marketing or public relations, it likely made a positive impression on the surrounding community and client base. Another unique strategy came in the form of marketing-from-within. This strategy is described in Section 5.3 – *Nontraditional Reactions*.

**Table 4-5: Contracting – Marketing Related Responses**

<b>MARKETING</b>		
<b>Response Type</b>	<b>Response Rate</b>	<b>Responses</b>
<b>LESSONS</b>	4	Company brand/reputation is important
<b>STRATEGIES</b>	2	Maintain project quality despite tight budgets
	1	Maintain pricing standards
	1	Market from within
	1	Increase charitable functions

#### **4.3.6 Contracting – Other Contracting Responses**

Other contracting responses made up 11% of Contracting related responses and 3.6% of total responses. The comments are shown below in Table 4-6. Other contracting related responses contain lessons and strategies mentioned by respondents that were not easily grouped

with other responses. Because of their unique nature, these lessons and strategies provided some of the most interesting contracting related responses.

Many respondents mentioned that the large high-quality projects procured before or at the start of the recession sustained them through much of the recession. The timing of these projects relative to the recession occurred more by chance than by planning, but they provided a potential strategy for future recessions. It was suggested that aggressively increasing backlog prior to a recession, even at lower margins, would greatly increase a company's success throughout the recession. Though this plan may prove successful, it is difficult to pursue as recessions are hard to time. Significant investment in economic forecasting may be required. Opposite of this and the majority of the interviewee's comments, some responses mentioned that business plans should not change during a recession. These respondents explained that a conservative and diverse business plan prepares a company so that it may successfully continue with that same business plan regardless of economic cycles.

Three respondents stated that increasing performance of self-performed work as a contracting related strategy. The theory behind this strategy was that by increasing self-performed work, the costs and risk associated with subcontractors would be minimized. Profits that would otherwise go to the subcontractor could now make up for reduced general contracting profits and fees. Likewise, additional self-performed work would allow companies to retain their employees in a labor capacity rather than let them go. Though this strategy was reported to be successful for companies that self-performed more unique or specialized work (work in which there was not a significant amount of subcontractor competition), one respondent reported that this approach failed. The interviewee recounted that attempts to increase self-performed concrete

was unsuccessful because concrete subcontractors were willing to reduce their prices further than the general contractor.

Contrary to the general trend, two respondents mentioned specialization as a way to improve contracting in the recession. One respondents indicated that his company focused on a niche market sector which reduced competition and increased profit margins. The niche business model included disadvantaged business classification to take advantage of government set-asides. The other respondent stated that specializing in more complex projects opened the door to negotiated work, even during recession. Complex projects involved highly technical construction, reduced schedules, or highly regulated buildings.

**Table 4-6: Contracting – Other Contracting Related Responses**

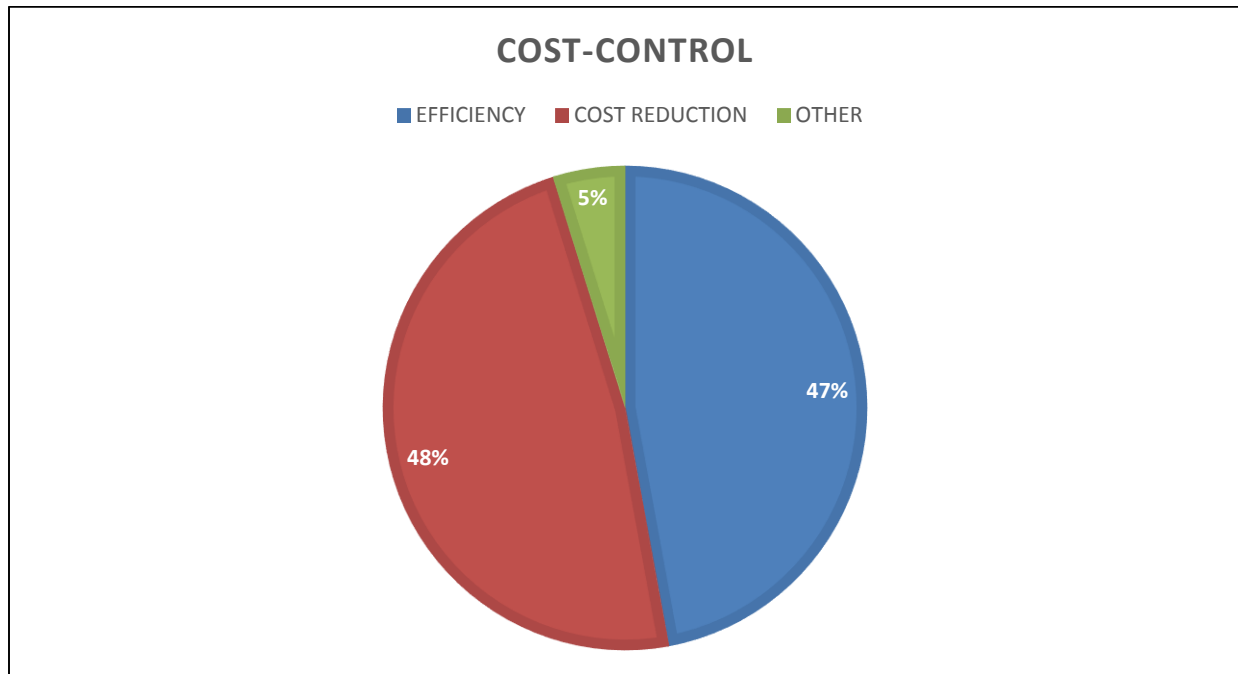
<b>OTHER</b>		
<b>Response Type</b>	<b>Response Rate</b>	<b>Responses</b>
<b>LESSONS</b>	9	Quality backlog at start of recession carried prevented significant recessionary loses
<b>STRATEGIES</b>	4	Aggressively increase backlog when signs of recession appear
	4	Maintain business plan regardless of economic cycles
	3	Increase performance of self-performed work
	1	Specialize in a low competition niche business
	1	Specialize in complex projects that facilitate/require collaborative delivery methods and negotiation

#### **4.4 Cost-Control**

Cost-Control related lessons and strategies describe companies' efforts to reduce overhead and project cost during the recession. The responses were further divided into three subcategories for more detailed analysis; Efficiency, Cost Reduction, and Other cost-control



related responses as shown below in Figure 4-3. Efficiency generally consisted of ways in which the company dealt with those cuts to provide a similar level of service with the reduced resources they were faced with. The following subsections detail the responses mentioned in these subcategories. Each subsection contains a table detailing the individual responses by the interviewees, the number of interviewees that mentioned a particular response, and whether that response was a lesson learned or a strategy implemented.



**Figure 4-3: Cost-Control Related Response Categories**

#### **4.4.1 Cost-Control – Efficiency**

Comments on Efficiency made up 47% of Cost-Control related responses and 8.1% of total responses. The comments are shown below in Table 4-7. With fewer resources and staff for projects, companies were forced to become more efficient. Companies accomplished this in a

variety of ways. Many companies embraced new technologies to reduce paperwork and coordination costs. This was generally considered to be very successful, but it is important to note that (in Subsection 4.7.4 – *Risk Management – Other Risks*) some respondents cautioned that new technology must be carefully vetted before implementation so as to avoid adopting technology that proved less user-friendly or productive than advertised.

Companies also increased efficiency through the cross-training of employees. Cross-trained employees, those able perform multiple functions within the company, were extremely valuable as companies were forced to downsize their workforce. Cross-trained employees were able to assume the vacated rolls of their former coworkers in addition to performing their own functions. These remaining employees were also often required to work longer hours to perform these additional functions. Overtime work was seen as a necessary evil that was required to maintain project schedules with reduced staff. Unfortunately it also created morale and loyalty problems amongst staff. This consequence is further discussed in Subsection 4.6.2 – *Human Resources – Morale and Loyalty*.

Self-performed work provided a unique opportunity for companies to increase efficiency, as it was the only labor that they directly controlled. Gaining efficiencies in this area provided significant benefits in the recession. One respondent mentioned that, though his company was attempting to reduce overhead costs, an operations manager was hired during the recession to improve field efficiency. The increase in field efficiency that this position created quickly overcame the initial salary and overhead costs incurred by this investment. Other companies made similar investments in efficiency through process improvements, efficiency reports, and increased quality control, which all provided similar benefits.

**Table 4-7: Cost Control – Efficiency Related Responses**

EFFICIENCY		
Response Type	Response Rate	Responses
LESSONS	15	Project resources and staff are more lean
STRATEGIES	7	Improve general efficiency <sup>A</sup>
	7	Use technology to improve efficiency <sup>B</sup>
	6	Cross-train employees
	5	Improve efficiency of self-performed/field work
	4	Process improvement/refinement
	3	Work overtime
	1	Create efficiency reports <sup>C</sup>
	1	Improve quality control
<p>A: Efficiency improvements mentioned include accurate communication, waste reduction, time-management, avoiding rework, in using lean construction practices.</p> <p>B: Technology included in responses was electronic billing, field tablet computers, and software.</p> <p>C: Efficiency reports include general efficiency statistics, overtime reports, and rental equipment reports.</p>		

#### 4.4.2 Cost-Control – Cost Reduction

Cost Reduction comments made up 48% of Cost-Control related responses and 8.3% of total responses. The comments are shown below in Table 4-8. Due to reduce project budgets and profit margins, companies took in less revenue to cover project costs and overhead. The main strategy that interviewees reported their companies using to cope with this was to cut staff, salaries, budgets, and other expenditures. Respondents further urged that such cuts should be made sooner rather than later. Cuts were often deferred because company decision makers believed that delayed projects would eventually materialize. It was reported that such jobs were often canceled and the overhead costs to retain the project teams intact were lost. Subsection

4.5.2 – *Financial – Operating Income* describes a method of automatic triggers built into a companies’ budgeting forecast to help avoid this issue.

**Table 4-8: Cost Control – Cost Reduction Related Responses**

COST REDUCTION		
Response Type	Response Rate	Responses
LESSONS	6	Project budgets are reduced
STRATEGIES	25	Cut expenses/overhead <sup>A</sup>
	16	Do not delay difficult decisions or cuts/changes <sup>B</sup>
	2	Freeze salaries
	1	Freeze hiring
<p>A: Expense/Overhead cutting measures include reducing staff, reducing salaries, eliminating self-performed work, reducing contingencies, eliminating staff lunches, furloughing staff not currently on projects, reducing training budgets, reducing IT budgets, eliminating bonuses, eliminating HR staff, eliminating marketing, recentralizing division services, cutting fat, and reducing other investments.</p> <p>B: Delays involved the retention of staff when there were no projects for them, and the retention of project teams for owner-delayed projects.</p>		

#### 4.4.3 Cost-Control – Other Cost-Control Responses

Other cost-control remarks made up 5% of cost-control related responses and 0.8% of total responses. The comments are shown below in Table 4-9. Contractors were often forced to use new subcontractors in an effort to reduce costs sufficiently to win work. For that same reason, some companies also used low-bid subcontractors rather than the most qualified subcontractors. Such strategies may be required to win work in the competitive recessionary environment, but they come with intrinsic risks. These strategies are refuted in Subsection 4.7.1 – *Risk Management – Subcontracting Risks*.

A more unique method of reducing costs was explained by one respondent. This respondent stated that some contractors would require the subcontractors to provide General Conditions items such as portable toilets to increase profits on jobs. These costs would then be reported as subcontractor costs to the owner and the contractor's fee as a percentage of these higher subcontractor costs would increase. Once the project had been bought out, the contractor would reabsorb these General Conditions responsibilities from the subcontractors and improve its profit margin. This strategy does not appear that it would be successful on a hard bid project, nor does it appear ethically sound, but it provides an interesting insight into the methods that were used to cope with the competitive market brought on by the recession.

**Table 4-9: Cost Control – Other Cost Control Related Responses**

<b>OTHER</b>		
<b>Response Type</b>	<b>Response Rate</b>	<b>Responses</b>
<b>STRATEGIES</b>	4	Use low bid/new subcontractors
	1	Move General Conditions costs onto subcontractors

#### **4.5 Financial**

Financial management strategies included companies' actions to improve their financial position in preparation for, and during, the recession. The responses were further divided into three subcategories for more detailed analysis; Pre-Recession Preparation, Operating Income, and Alternative Revenue as shown below in Figure 4-4. The most mentioned responses involved Operating Income at 61% of all financial related responses. Pre-Recession Preparation was second at 34% and finding Alternative Revenue sources was third at 5% of all financial related

responses. The following subsections detail the responses mentioned in these subcategories. Each subsection contains a table detailing the individual responses by the interviewees, the number of interviewees that mentioned a particular response, and whether that response was a lesson learned or a strategy implemented.

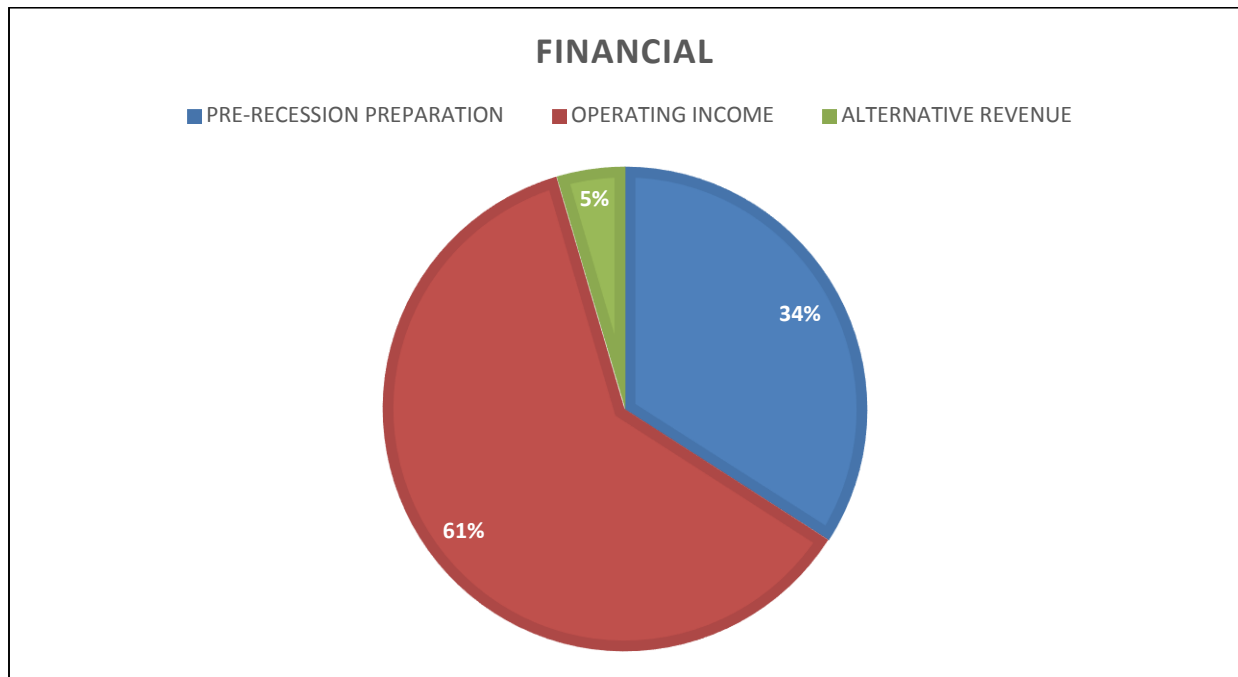


Figure 4-4: Financial Related Response Categories

#### 4.5.1 Financial – Pre-Recession Preparation

Remarks concerning Pre-Recession Preparation made up 34% of Financial related responses and 2.5% of total responses. The comments are shown below in Table 4-10.

Interviewee mentioned various company efforts to prepare for the most recent recession, as well as for any future recession. The most commonly mentioned strategy was to operate and grow conservatively in the up market. Though this strategy initially appeared rudimentary, it is one

that numerous respondents report was disregarded during good economic times. As the economy entered an up cycle, the demand for building substantially increased and profit margins rose dramatically. Interviewees recounted that, in an effort to capture the maximum amount of this work and profit, companies rapidly expanded to meet the demand. The negative consequences of this rapid growth included hiring subpar employees, providing inadequate training, and a loss of process control and efficiency. Respondents stated that the inefficiencies inherent in this rapid growth increased overhead costs disproportionately to the gains made in production levels. Additionally, some companies leveraged themselves to pay for this expansion. Respondents observed that companies entering the recession with lower quality employees, high overhead, and increased debt generally experienced significant retraction and, in some cases, insolvency.

One respondent conceded that conservative and deliberate growth during the up economy reduced his company's ability to fully maximize its profits during that period, but confirmed that the long term benefits of this strategy outweighed potential short term losses. Another respondent denied that this strategy resulted in even short term losses. This respondent explained that his former company grew significantly during the economic boom of leading up to the recession in 2008, but that due to increased inefficiencies and overhead brought on by this growth, its net profits remained largely unchanged.

Operating and growing conservatively prior to the recession, reducing or eliminating debt, conservatively investing any excess revenue, and building a cash reserve were all strategies reported to adequately prepare companies for the recession. These actions allowed companies to enter the recession with minimal overhead and debt, as well as the cash on hand to cover these costs in the event of reduced revenue due to the competitive recessionary environment.

**Table 4-10: Financial – Pre-Recession Preparation Related Responses**

PRE-RECESSION PREPARATION		
Response Type	Response Rate	Responses
STRATEGIES	8	Operate and grow conservatively prior to the recession
	4	Reduce or eliminate debt prior to the recession
	2	Invest cash conservatively prior to the recession
	1	Build cash reserves prior to the recession

#### 4.5.2 Financial – Operating Income

Comments regarding Operating Income made up 61% of Financial related responses and 4.5% of total responses. The comments are shown below in Table 4-11. Interviewees reported that fees were greatly reduced during the recession. This observation was not surprising, but respondents did note surprise that fees had been so slow to increase during the recovery. The reduction in operating income, both in the recession and in the recovery, led to several strategies attempting to ensure that income exceeded expenditures. The most commonly mentioned strategy was the refusal to perform no-profit work. Interestingly, this directly conflicts with the strategy mentioned by other respondents of procuring work at no profit as mentioned in Subsection 4.3.1 – *Contracting – Bidding*. Companies must decide which model best fits with their business plan, but generally more respondents supported a refusal to perform no-profit work. Refusal of no-profit work reduced the number of jobs that companies won. However, this strategy also reportedly reduced the risk of unrecoverable damage to companies from project failures.

Other strategies involved careful monitoring and management of budgets and cash flow.

One company in particular mentioned creating business plans during the recession which had



specific triggers tied to various performance indicators. If a performance indicator was triggered, revenues falling below a certain point for example, the company would automatically carry out a pre-planned cut or change to ensure that the business remained financially viable. This forced the company to avoid delaying critical decisions as mentioned in Subsection 4.4.2 – *Cost-Control – Cost Reduction*.

**Table 4-11: Financial – Income Related Responses**

OPERATING INCOME		
Response Type	Response Rate	Responses
LESSONS	13	Fees diminished during the recession and are slow to increase during the recovery
STRATEGIES	9	Do not perform no-profit work
	2	Monitor cash flow carefully <sup>A</sup>
	2	Perform rigorous budgeting and capital spends forecasting
	1	Build in economic or financial indicators that will prompt cuts or changes
A: Respondents specifically mentioned monitoring receivables to avoid under-billing.		

#### 4.5.3 Financial – Alternative Revenue

Comments about alternative revenue sources made up 5% of Financial related responses and 0.3% of total responses. The comments are shown below in Table 4-12. Due to the reduction in revenue experienced during the recession, some companies sought alternate revenue sources to maintain financial viability. One respondent reported that his company’s ownership was sold to a larger nationwide commercial construction company. The company generally continued operating autonomously, but it was able to draw upon the financial resources of its parent company when necessary. This move also allowed the company to increase its bonding capacity

and shift staff to and from the parent company as needed to pursue a specialized project or fill another need.

The owners of another company chose to loan personal assets to the company during the recession in order to inject necessary cash. The ancillary effect of improving employee morale within that company was also reported because of this action. One employee mentioned that the owner’s investment of personal assets in the company increased the feeling of comradery within the organization. This culture of togetherness during the recession was reported to have improved company morale.

**Table 4-12: Financial – Alternative Revenue Related Responses**

<b>ALTERNATIVE REVENUE</b>		
<b>Response Type</b>	<b>Response Rate</b>	<b>Responses</b>
<b>STRATEGIES</b>	1	Company owners loan personal assets to company to temporarily improve cash flow
	1	Use resources of larger parent company

#### **4.6 Human Resources**

Human Resources encompassed the lessons learned or reinforced and the strategies implemented during the recession with regard to companies’ personnel. The responses were further divided into five subcategories for more detailed analysis; Staffing Control, Morale/Loyalty, Attitude, Training, and Other human resources related responses as shown below in Figure 4-5. Staffing control was the most mentioned at 44% of Human Resources related strategies and lessons. Employee morale and loyalty came in second at 34% of Human Resources related comments. The following subsections detail the responses mentioned in these

subcategories. Each subsection contains a table detailing the individual responses by the interviewees, the number of interviewees that mentioned a particular response, and whether that response was a lesson learned or a strategy implemented.

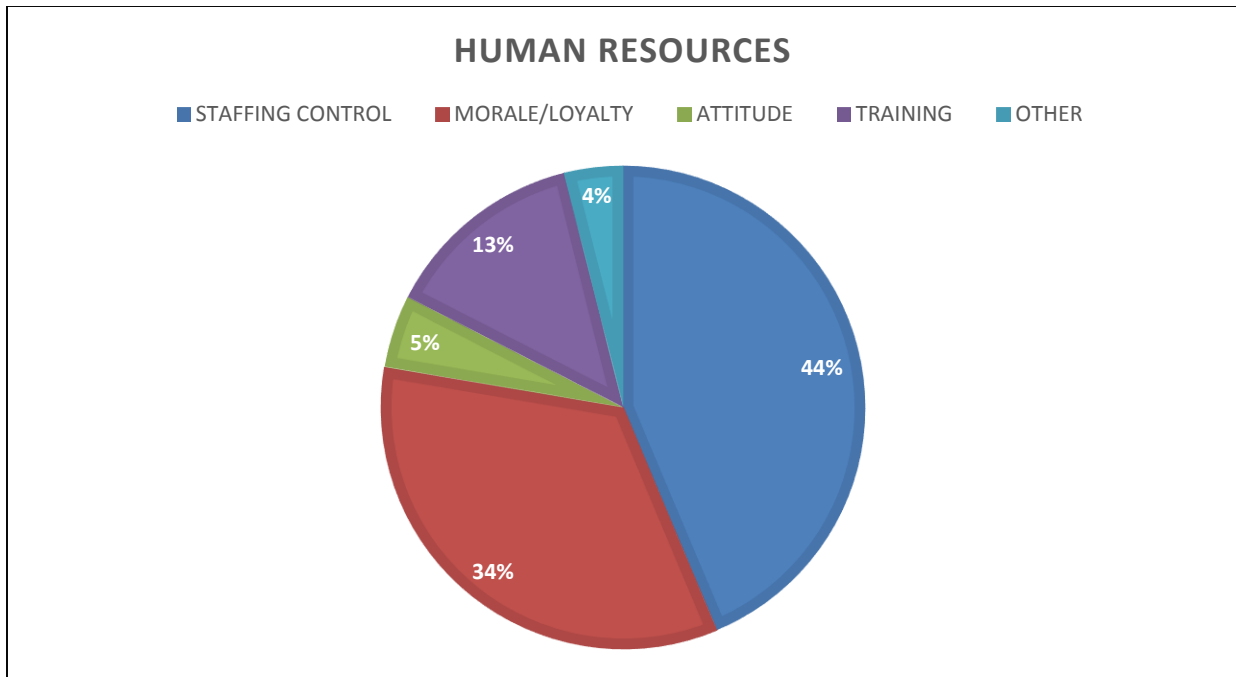


Figure 4-5: Human Resources Related Response Categories

#### 4.6.1 Human Resources – Staffing Control

Staffing Control comments made up 44% of Human Resources related responses and 7.4% of total responses. The comments are shown below in Table 4-13. Staffing control included companies' efforts in retaining and/or reducing their staffing to meet the dynamic needs of the company through the recession and recovery. Respondents noted that the decreased amount of work available often necessitated a commensurate decrease in manpower for their companies, as well as for many of their subcontracting partners. Due to this competitive environment, project

budgets and fees were reduced in order for companies to procure what work was available. The diminished revenue from the reduction in the number of jobs available as well as the reduced project budgets and fees forced some companies to further decrease manpower in an effort so as to cut expenses. Such reductions caused industry wide manpower shortages as well as shortages on individual projects. Some companies dealt with this by cutting salaries, benefits, and bonuses rather than manpower. This strategy was generally given negative reviews by respondents because it reduced the loyalty and morale of the company while not sufficiently reducing overhead costs. Manpower shortages were exacerbated in the recovery as the increase in available work was not met with a proportionate increase in qualified employees entering the field. During the recession, many construction workers left the industry and have not returned in the recovery.

Respondents mentioned strategies to eliminate or minimize these effects by carrying all employees through the recession regardless of whether there was work for them to perform, or by carrying key employees during the recession even as lower quality employees were removed through attrition. This strategy was reported to better prepare companies for the recovery by reducing the need to refill capacity and train new employees as the economy improved. It is however, in direct conflict with the responses of other interviewees (in Subsection 4.4.2 – *Cost-Control – Cost Reduction*) that prescribed a strategy of reducing any unnecessary manpower. Companies with multiple divisions or market sectors were able to avoid such a conflict by shifting key employees to other, more active, areas rather than let them go. Respondents that employed strategies of employee retention reported significant benefits, especially in the recovery. Whether such strategies are always beneficial may depend on the cash reserves the company has on hand to for employee retention as well as the length of the recession.

As expected due to the reported lack of organizational learning in construction, few respondents mentioned formal strategies for dealing with the manpower shortages in the industry. A few respondents, however, did mention that their companies are proactive in attempting a long term solution to these manpower shortages by creating, supporting, and participating in feeder programs and apprenticeship programs to encourage high school and college aged youth to pursue careers in construction. Such plans are encouraging as they demonstrate a level of organizational learning within the companies that generated them.

**Table 4-13: Human Resources – Staffing Control Related Responses**

STAFFING CONTROL		
Response Type	Response Rate	Responses
LESSONS	15	Manpower shortages
	3	Salary, benefit, and bonus cuts reduces employee loyalty
STRATEGIES	8	Maintain capacity – Carry employees rather than lay off staff <sup>A</sup>
	5	Carry key employees
	4	Reduce lower quality staff through attrition
	3	Create/support employee feeder programs to increase industry manpower
	3	Shift manpower between markets or divisions to maintain capacity
	2	Create/support apprenticeship programs to increase industry manpower
	1	Refill capacity in recovery
	1	Cut manpower instead of wages/benefits
A: Maintaining capacity improves the ability to ramp up production and reduces the need for significant training investments in the recovery.		

#### 4.6.2 Human Resources – Morale and Loyalty

Comments about Employee Morale and Loyalty made up 34% of Human Resources related responses and 5.8% of total responses. The comments are shown below in Table 4-14. Respondents noted the importance of less tangible elements in company performance, such as morale and loyalty, during the recession and recovery. As mentioned in the previous section, attempts to improve companies' cash flow by reducing manpower, salaries, benefits, and bonuses reportedly diminished employee loyalty and morale significantly. Alternately, respondents mentioned that efforts to retain key employees, regardless of whether there was sufficient work to cover their cost, improved morale and loyalty. Interviewees reported difficulty in striking a balance between cost reduction and employee retention. Though employee loyalty and morale were not directly tied to revenue and cash flow, they affected employee productivity and turnover rates. This in turn affected the cost associated with hiring and training replacement employees. Such costs were substantial in the recession, and perhaps even greater in the recovery. As manpower shortages increased in the recovery, quality employees commanded a premium for their services. Employees lost in the recession or recovery were often replaced with inferior or less experienced employees that required significant training and/or produced less than the employees they supplanted.

To avoid this potential issue, companies focused on educating employees on the recession and communicating with them about the company's position. Understanding the reasoning for the company's position and the strategies it was pursuing reportedly assuaged some employee fears as to their job security, deterring them from seeking other employment. When cuts were made that affect employees, an understanding of their rationale and a plan for their eventual restoration prevented employees seeking alternate employment.

The reduced employment opportunities in the recession prevented some employees from leaving their companies regardless of working conditions. Interviewees reported that some companies became complacent about employee morale during this time. However, these companies experienced significant employee turnover in the recovery. During the recovery, when employees were more apt to leave their current companies due to a greater availability of other jobs, respondent companies made efforts to conduct employee surveys and correct any behavior or processes that may have been harming employee loyalty.

**Table 4-14: Human Resources – Morale / Loyalty Related Responses**

<b>MORALE/LOYALTY</b>		
<b>Response Type</b>	<b>Response Rate</b>	<b>Responses</b>
<b>LESSONS</b>	12	Employee morale/loyalty important
	1	Cutting human resources employees may cause reduce company's ability to cope with morale/loyalty issues
<b>STRATEGIES</b>	17	Conduct employee surveys
	1	Use employee ownership to increase engagement
	4	Educate and communicate with employees about recession and the company's position

#### **4.6.3 Human Resources – Attitude**

Comments about company Attitude made up 5% of Human Resources related responses and 0.8% of total responses. The comments are shown below in Table 4-15. Respondents mentioned admiration for companies that did not frame the recession as a threat, but rather as an opportunity to improve the industry and themselves. This attitude was reported to directly influence the morale of individual employees.

**Table 4-15: Human Resources – Attitude Related Responses**

ATTITUDE		
Response Type	Response Rate	Responses
LESSONS	3	Industry is stronger because of recession
	1	Confidence increases due to recession survival
STRATEGIES	1	Do not use the recession as an excuse

#### **4.6.4 Human Resources – Training**

Training remarks made up 13% of Human Resources related responses and 2.3% of total responses. The comments are shown below in Table 4-16. Due to the reduction in project sizes experienced by some respondents, the reduction jobs available, manpower shortages, and reduced training budgets, it was noted that some employees who spent their formative years during the recession may not be adequately trained. This, and the recruitment of new employees to accommodate growth in the recovery required increased efforts and investment in employee development. Some respondents stated that their companies avoided this pitfall through employee development programs during the recession. As previously mentioned, some companies retained employees during the recession despite the lack of projects. While not assigned to a specific project, these employees were available for excess training and participation in other personnel development or innovation programs.

Another intriguing response was the importance of integrating the younger generation of employees with the older generation. The advent of new technology in the construction industry such as BIM, the utilization of tablet computers in the field, cloud computing, and project management software has created a stark contrast between younger and older generations of



employees. Mentoring programs and other teambuilding exercises have allowed companies to benefit from the technological prowess of the younger generation as well as the experience of the older generation, while reducing conflicts between the two.

**Table 4-16: Human Resources – Training Related Responses**

<b>TRAINING</b>		
<b>Response Type</b>	<b>Response Rate</b>	<b>Responses</b>
<b>LESSONS</b>	2	Employees that spent their formative years during the recession may not be adequately trained
	2	Recovery growth requires training investment
<b>STRATEGIES</b>	7	Invest in personnel development during recession <sup>A</sup>
	3	Intergenerational integration <sup>B</sup>
A: Personnel development includes training, teambuilding, and mentoring.		
B: Intergenerational integration involves the connecting newer more technologically savvy employees with older more experienced employees to take advantage of both skills.		

#### **4.6.5 Human Resources – Other Human Resources Responses**

Other human resources responses made up 4% of Human Resources related responses and 0.7% of total responses. The comments are shown below in Table 4-17. Though it initially appeared elementary, the policy of expanding staff carefully and deliberately in the recovery was mentioned by respondents as an area where companies erred in the build up to the recession, and repeated the same error in the recovery. As demand for services increased in the recovery, companies sought to quickly build or increase capacity to meet this demand. Without this increased capacity, companies may have been precluded from winning work, which in turn could have caused them to lose market share. Due to manpower shortages in the recovery, high-quality,

well-trained employees were in high demand and short supply. Companies hired subpar employees to fill capacity. Further, in efforts to quickly increase production, companies promoted newer employees before they were adequately trained. This led to inefficient production. A substantial growth in company size and overhead without a corresponding growth in production provided short term benefits in the up cycle, but set the company up for severe downsizing in future down markets.

**Table 4-17: Human Resources – Other Human Resources Related Responses**

OTHER		
Response Type	Response Rate	Responses
STRATEGIES	4	Staff carefully/deliberately in the recovery

#### 4.7 Risk Management

Risk Management responses included actions or conditions that interviewees identified as risks to the well-being of the company, as well as strategies taken to avoid or mitigate these risks. Within Risk Management, four subcategories of responses were identified; Subcontracting Risks, general recessionary Risk Identification and Mitigation, risks inherent in the Recovery, and Other unique risks that could not be readily formed into groups as shown in Figure 4-6 below. Of these groups, Subcontracting Risks were the most common response at 43% of Risk Management related responses. Respondents consistently mentioned subcontracting as the greatest risk to their company during the recession. The following subsections detail the responses mentioned in these subcategories. Each subsection contains a table detailing the

individual responses by the interviewees, the number of interviewees that mentioned a particular response, and whether that response was a lesson learned or a strategy implemented.

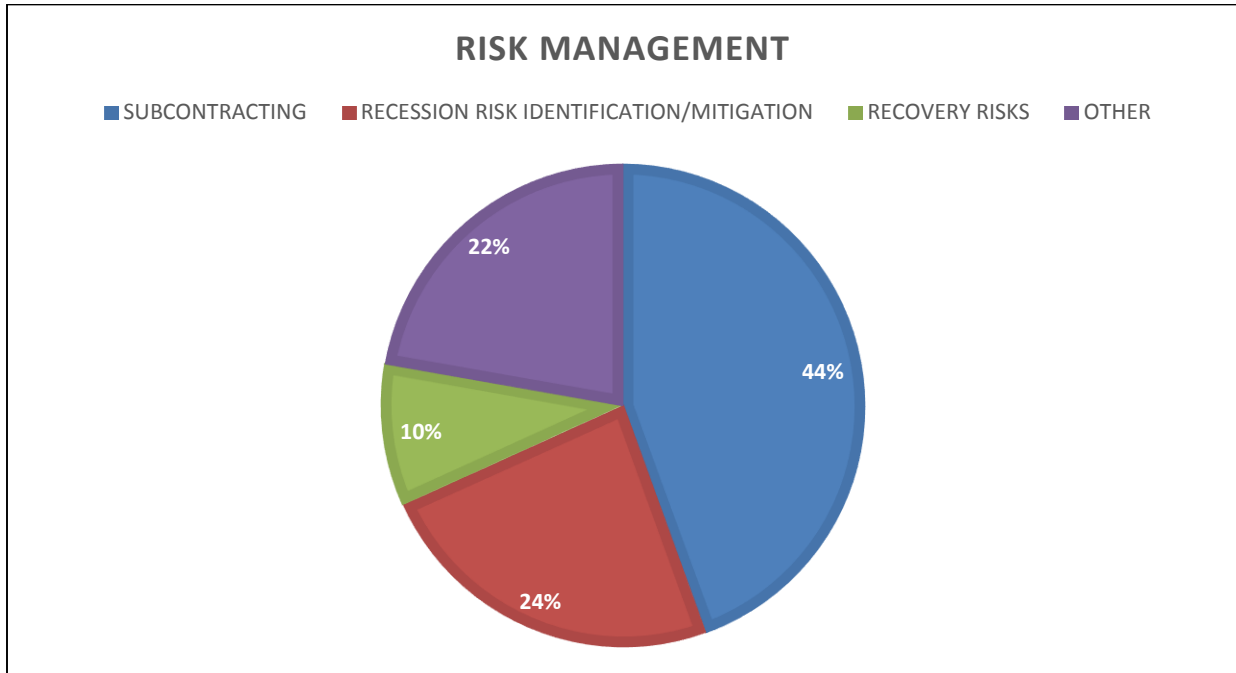


Figure 4-6: Risk Management Related Response Categories

#### 4.7.1 Risk Management – Subcontracting Risks

Comments about Subcontracting Risks made up 44% of Risk Management related responses and 9.3% of total responses. The comments are shown below in Table 4-18.

Subcontractor default became a serious issue for general contractors. Subcontractors that were able to perform still faced manpower shortages which affected project schedule. As mentioned in Subsection 4.3.2 – *Contracting – Client Relations*, clients became more demanding on both cost and schedule during the recession. Subsequently, subcontractor caused schedule delays posed a great threat to general contractor’s client relations.

Subcontractor vetting and prequalification was the most mentioned strategy for dealing with subcontractor risk. Many respondents mentioned that their companies created or bolstered substantial prequalification programs that included financial checks, interviews, and references. Subcontractor bids were also examined more closely to verify that subcontractors covered the entirety of the scope or the project and that their prices were sufficient to allow them to perform the work. In Subsection 4.4.3 – *Cost-Control – Other Cost-Control Responses*, interviewees mentioned the necessity of using new or low-bid subcontractors to win work. In this subsection, respondents refuted this claim by stating that subcontractor quality may be more important than initial cost. Respondents claimed that it was better to lose a bid by using more expensive subcontractors of known quality, than to use low-cost subcontractors that may be unable to perform the work.

To further protect themselves against subcontractor default, general contractors began purchasing (or having the client purchase) subcontractor default insurance. Companies also increase subcontractor bonding requirements, applied subcontractor performance contingencies when the project budget permitted, and tightened their control on subcontractor payments. Contractors began a more thorough process of subcontractor payment that included verifying the amount of work actually performed, verifying that all lien releases were included and genuine, and verifying that any required union letters were included and genuine.

One respondent mentioned that his company had engaged in multi-prime contracts during the recession to reduce the risk posed by subcontractors. In this delivery method, the general contractor contracted with the client in a construction manager roll. The subcontractors contracted with the client rather than to the general contractor. The general contractor was then paid a stipulated fee for its services as construction manager and the client assumed any risk or

savings from the subcontractors. This approach reduced the potential overall profit for the project, but it also greatly reduced the potential risks to the general contractor.

**Table 4-18: Risk Management – Subcontracting Related Responses**

SUBCONTRACTING		
Response Type	Response Rate	Responses
LESSONS	14	Subcontractor Default
	5	Manpower shortages negatively affect schedule
STRATEGIES	13	Subcontractor vetting and prequalification
	7	Subcontractor bid analysis <sup>A</sup>
	7	Subcontractor quality <sup>B</sup>
	3	Subcontractor payment control <sup>C</sup>
	3	Subcontractor insurance
	2	Subcontractor bonding
	1	Subcontractor contingency
	1	Multi-prime contracts <sup>D</sup>
<p>A: Subcontractor bid analysis includes cost and scope.</p> <p>B: Avoid low-bid subcontractors. Low-bid subcontractors may increase project change orders.</p> <p>C: Payment control responses include verifying work completed, lien releases, and union letters.</p> <p>D: Multi-prime contracts shift subcontractor risk from the general contractor to the owner.</p>		

#### 4.7.2 Risk Management – Risk Identification and Mitigation

Risk Identification and Mitigation comments made up 24% of Risk Management related responses and 5.0% of total responses. The comments are shown below in Table 4-19. Risk Identification and Mitigation included the strategies that companies employed to protect themselves from the various risks that were created or magnified during the recession. The most

common response was to invest in education about the recession. The knowledge gained was meant to guide company leaders in creating recessionary strategies. This included studying economic data, market forecasts, and trends in an attempt to predict duration and intensity of the recession. This also included studying various business strategies to create a recessionary business plan that dealt with clients, employees, and other aspects of difficult economic times.

Respondents consistently mentioned the importance of preconstruction coordination in efforts to identify and mitigate risks early in the design and construction process. Increased efforts and investments in estimating, especially to fully understand the scope of the projects and to take into account the rapid cost changes that occur in a recession and recovery, potentially increased company overhead but were also noted to have greatly improved project success. One respondent mentioned that within his company, project managers performed preconstruction services on their own projects. The respondent noted that though this approach may have reduced company overhead, its major benefit was the continuity between preconstruction and construction that avoided misinterpretations and miscommunications about project scope, budget, schedule, or other coordination.

**Table 4-19: Risk Management – Risk Identification / Mitigation Related Responses**

<b>RISK IDENTIFICATION / MITIGATION</b>		
<b>Response Type</b>	<b>Response Rate</b>	<b>Responses</b>
<b>STRATEGIES</b>	14	Invest in education about recession <sup>A</sup>
	12	Invest in preconstruction <sup>B</sup>
	3	Invest in risk management
	1	Project managers perform preconstruction
A: Understand markets, forecasts, strategies, and trends		
B: Estimating, understanding labor escalation, preplanning/coordination, risk identification, cost changes, and scope.		

### 4.7.3 Risk Management – Recovery Risks

Recovery Risk comments made up 9% of Risk Management related responses and 2.0% of total responses. The comments are shown below in Table 4-20. These responses came in the form of lessons learned which, in an effort to best categorize the data received, were not grouped with corresponding strategies. Strategies that mitigated these risks were identified, however, and were referenced in the detailed descriptions of the risks below.

The most mentioned recovery risk was specialization as the economy improved. Respondents noted that the multifamily housing industry greatly increased during the recession and continued to flourish in the recovery. Many companies invested a significant amount of their resources, at the detriment of diversification, to building multifamily housing. As this occurred, their resumes in other market sectors grew stale, further inhibiting them from pursuing other project types. While this strategy may have proved lucrative as the multifamily housing market continued to increase, interviewees worried that its inevitable slowdown would cause those companies significant damage. Mitigation for this risk was through diversification as mentioned in Subsection 4.3.4 – *Contracting – Diversification*.

Similarly, rapid growth in the recovery was also noted to be detrimental to companies. This risk was meant to be mitigated by the strategy of conservative growth and operation prior to any potential recession as mentioned in Subsection 4.5.1 – *Financial – Pre-Recession Preparation*. As the economy entered an up cycle, the demand for building largely increased and profit margins generally improved. Attempting to capture the maximum amount of this work and profit, many companies hastily increased capacity to secure this work. The risks to this rapid growth included potentially hiring subpar employees, inadequate training, a loss of process control, and reduced efficiency due to the influx of new and potentially inadequate employees.

Such rapid growth reportedly increased overhead costs disproportionately to the gains made in production levels. Further, companies often leveraged themselves to pay for this rapid growth. Interviewees advised that entering a future recessionary period with lower quality employees, high overhead, and increased debt would lead to significant retraction and potential insolvency. Respondents noted that these same issues occurred before the most recent recession, leading to many of the problems noted in this research. Witnessing the same actions that damaged so many companies in the last recession already occurring in its recovery was of great concern to the respondents that mentioned this risk. This observation also supports the belief that the construction industry is slow to employ organizational learning.

Employee retention was recovery risk noted by respondents. Employees often had few options during the recession. Many experienced salary cuts, elimination of bonuses, and even reduced benefits as their companies attempted to reduce overhead costs. As manpower was reduced, the remaining employees were often required to work extended hours to replace their lost coworkers. With few alternative options, employees frequently stayed with their current companies, regardless of their job satisfaction. In the recovery, especially after the prolonged recession where numerous employees had left the construction industry, there was high demand for skilled employees. Those employees that remained with their current companies because of a lack of alternative, often accepted offers at other companies. Employees that felt mistreated during the recession were even more likely to leave. Potential mitigating strategies to this included maintaining capacity, educating and communicating with employees about the recession and the company's position, and conducting employee surveys as mentioned in Section 4.6 – *Human Resources*.



**Table 4-20: Risk Management – Recovery Risk Related Responses**

RECOVERY RISKS		
Response Type	Response Rate	Responses
LESSONS	5	Specialization in good economy <sup>A</sup>
	4	Rapid growth in recovery <sup>B</sup>
	2	Employee retention in recovery
	1	Companies fail in recovery
<p>A: As the economy improves, focusing on one profitable market sector may make a company more susceptible to future downturns.</p> <p>B: Growing rapidly in the recovery may lead to a change in company culture, a loss in diversity, and potential future downsizing.</p>		

#### 4.7.4 Risk Management – Other Risks

Other Risk related comments made up 23% of Risk Management related responses and 5.0% of total responses. The comments are shown below in Table 4-21. They contained important observations about the risks associated with the recession but could not be readily grouped with other comments. They included lessons learned but, as with Recovery Risks, were not grouped with potential mitigating strategies. Potential mitigating strategies were noted and referenced in the detailed descriptions of the risks below.

The most commonly mentioned of these were unfamiliarity risks. In efforts to procure work in the recession, companies occasionally went beyond their areas of expertise. Unfamiliarity risks included entering new geographic regions, entering new markets, using new subcontracting partners, using new technology, working for new clients, accepting projects that were considerably larger or smaller than the company was familiar with, and using delivery methods that the company was not familiar with during the recession. The most mentioned of

these risks was entering new regions at five responses, followed by entering new markets at four responses. Respondents explained that entering new regions and markets may be beneficial from a diversity standpoint, but that such diversification should ideally have been achieved prior to the recession. Prior to the recession, there was a sufficient amount of work, manpower, profit margin, and contingency to offset any mistakes made in these new areas. Respondents further mentioned that these new areas should have been entered into gradually. Fewer unfamiliar projects and smaller project sizes reduced the risk of a single project failure causing unrecoverable financial harm to the company.

Underbidding projects was another frequently mentioned risk. Though the recession necessitated that fees and budgets be reduced in order to compete with other companies for work, respondents stated that it was better to lose a bid than to win a project at such a reduced price the work would be unprofitable. However, it was also noted that preparing and submitting a bid involved a significant resource investment. If bids were not sufficiently low to be competitive, this investment was wasted. For this reason, investing in preconstruction was included in both Subsection 4.7.2 – *Risk Management – Risk Identification and Mitigation* and in Subsection 4.3.1 – *Contracting – Bidding*.

Respondents commented that due to the reduction in available funds during the recession and the rapid increases in construction costs during the recovery, client's budgets were often significantly lower than the current cost of construction. This resulted in substantial value engineering, change orders, and other costs to time and budget. Such issues affected client relations, subcontractor relations, project schedule, and project cost. Investment in preconstruction, client relations, and subcontractor relations were all strategies mentioned to resolve many of these issue early in the process.

Interviewees observed that the construction documents produced during and following the recovery were often less complete than they had been before the recession. They noted that designers experienced reduced budgets and fees as well, and hypothesized that the reduced resources were resulting in less complete construction documents. With the reduced amount of information contained in the incomplete construction documents, identification and mitigation of potential project risks became more difficult, but also more crucial. Investment in preconstruction was again mentioned as a risk mitigation procedure.

One respondent made an important note that company diversity, though overwhelmingly considered valuable, may have increased overhead. It was noted that the benefits of diversity outweighed its potential drawbacks, but that companies considering diversification should carefully study its ramifications. Increased overhead was mentioned in the form of redundant staffing to ensure the company employs specialists in its various market sectors as well as redundant support services for multiple offices or divisions.

Another unique response was the threat of new regulations. Though this threat is not specific to recessionary periods, its effects were reported to be more detrimental in the recession. Lack of knowledge or familiarity with new regulations led to rework, increased quality control, new testing, and project delays. These activities often required additional time, money, and manpower to rectify. Reduced project budgets and schedules, as well as manpower shortages during the recession made it difficult to correct any issues that arose due to new regulations imposed on projects. Increased investment in gaining awareness of, and familiarity with, new regulations was suggested to avoid significant losses or project delays.

**Table 4-21: Risk Management – Other Risk Management Related Responses**

OTHER		
Response Type	Response Rate	Responses
LESSONS	17	Unfamiliarity risks <sup>A</sup>
	5	Bidding too low for project risk
	3	Low project funds/ Value engineering
	2	Construction documents are less complete
	2	Diversity increases overhead <sup>B</sup>
	1	New regulations
<p>A: The recession forced companies to take on challenges that they were not familiar with and may not have been adequately prepared to handle. These included entering new geographic regions, new market sectors, new technology, new subcontractors, new clients, new project sizes, and new delivery methods.</p> <p>B: Though diversity is generally considered beneficial in a recession, it may require increased overhead in the form of market sector specialists and redundant support services.</p>		

#### 4.8 Investment

Other investments were made during the recession that are categorized elsewhere. For example, a total of seven respondents mentioned investing in employee development and training during the recession. Those responses were categorized in Human Resources rather than Investments, because their main intent was to improve company staffing in an effort to cope with the recession, rather than specifically take advantage of the recession. Likewise, investment in increased efficiencies were categorized in Cost-Control, as that was their main purpose. The investments noted here were specifically performed to take advantage of the opportunities presented in the recession.

Within Investment, five subcategories of responses were identified; Staff, Equipment, Market Share, Resource and Process Investment, and Investment Maintenance as shown below

in Figure 4-7. Of these groups, Investment Maintenance was the most common response at 50% of Investment related responses. This subcategory describes companies' efforts to retain the efficiency and diversity that they acquired during the recession. Without this category, investments during the recession would only have accounted for 2.5% of total responses. The following subsections detail the responses mentioned in these subcategories. Each subsection contains a table detailing the individual responses by the interviewees, the number of interviewees that mentioned a particular response, and whether that response was a lesson learned or a strategy implemented.

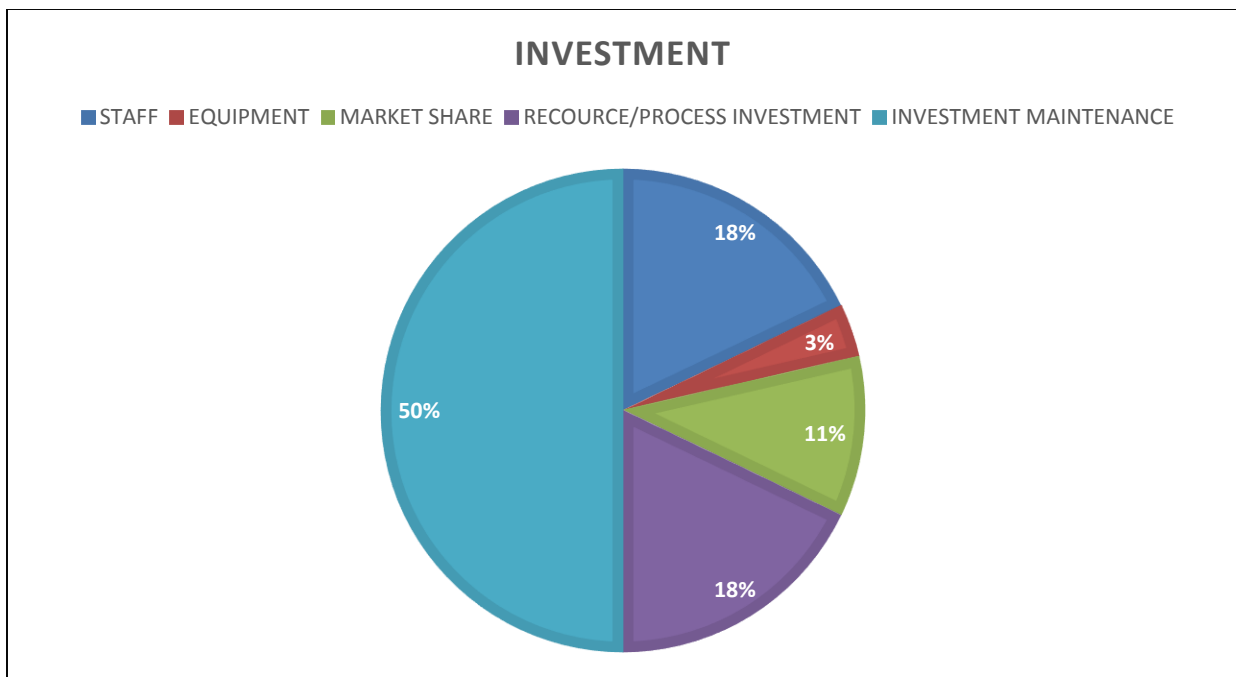


Figure 4-7: Investment Related Response Categories

#### 4.8.1 Investment – Staff Investment

Comments related to Staff Investment made up 18% of Investment related responses and 0.8% of total responses. The comments are shown below in Table 4-22. Respondents noted that their companies purposefully used the recession as an opportunity to upgrade their staff. This occurred by releasing less productive staff and hiring high quality employees from struggling competitors. Reductions in the amount of work available meant that there may not have been an immediate need for these new employees. Instead, these hires were generally made in preparation for the future recovery. The upgraded staff would then allow companies to take full advantage of the increase in available work. These respondents mentioned that this strategy gave their companies a marked advantage over competitors that had significantly reduced staff during the recession. Those competitors needed to hire and train suitable replacements before they could take full advantage of the recovery. Two respondents mentioned that though quality employees could be recruited from struggling competitors, it was important to provide an attractive employment offer, even in the recession, so as to ensure that they remained with the company during the recovery when their presence was most needed.

**Table 4-22: Investment – Staff Related Responses**

STAFF		
Response Type	Response Rate	Responses
STRATEGIES	5	Upgrade employees during recession

#### 4.8.2 Investment – Equipment Investment

Comments related to Equipment Investment made up 3% of Investment related responses and 0.2% of total responses. The comments are shown below in Table 4-23. One respondent mentioned that his company purposefully used the recession as an opportunity to purchase equipment at reduced cost from struggling competitors and suppliers.

Table 4-23: Investment – Equipment Related Responses

EQUIPMENT		
Response Type	Response Rate	Responses
STRATEGIES	1	Buy equipment at reduced cost during recession

#### 4.8.3 Investment – Market Share Investment

Comments related to Market Share Investment made up 11% of Investment related responses and 0.5% of total responses. The comments are shown below in Table 4-24. Companies that used this strategy recognized the recession as period of retraction or even insolvency for many of their competitors. As many companies were forced to reduce their market presence, some companies chose to take advantage of this opportunity to increase their market share by opening new offices or divisions during the recession. Manpower, office space, and equipment was more available and could often be procured at reduced cost. This strategy was generally reported to be successful, but it was also noted to contain inherent risks. As mentioned above in Subsection 4.8.1 – *Investment – Staff Investment*, quality employees could be recruited from struggling competitors, but it was important not to seek the lowest cost for them as that would potentially lead to their leaving the company during the recovery (when their

presence was most needed). The potential risk of unfamiliarity that is innate in this strategy was also noted in Subsection 4.7.4 – *Risk Management – Other Risks*.

**Table 4-24: Investment – Market Share Related Responses**

MARKET SHARE		
Response Type	Response Rate	Responses
STRATEGIES	3	Open new offices/divisions during recession

#### 4.8.4 Investment – Resource and Process Investment

Comments related to Resource and Process Investment made up 18% of Investment related responses and 0.8% of total responses. The comments are shown below in Table 4-25. This section included general responses regarding the plan to use the recession as an opportunity to invest in resources and processes. This investment may have been time, manpower, finances, or other expenditures meant to use the recession to the advantage of the company.

The response that day-to-day focus inhibited innovation was only mentioned by one respondent, but provided a potentially vital explanation as to why construction is so slow to adopt organizational learning. Though the recession gave the appearance of a prime environment for organizational learning as described in Section 2.3 – *Organizational Learning and Environmental Changes*, the manpower shortages experienced by some companies may simply have made employees too busy to apply organizational learning principles within their companies. Automated or formalized organizational learning mechanisms, as detailed in Section 4.9 – *Organizational Learning Mechanisms*, may have removed this obstacle from some companies and improved their organizational learning, consequently improving their



performance. Section 4.10 – *Company Comparison* was created to determine if any such correlation occurred.

**Table 4-25: Investment – Resource / Process Related Responses**

<b>RESOURCE / PROCESS INVESTMENT</b>		
<b>Response Type</b>	<b>Response Rate</b>	<b>Responses</b>
<b>LESSONS</b>	1	Recession an opportunity to refine processes
	1	Day-to-day focus inhibits innovation
<b>STRATEGIES</b>	3	Invest for recovery during recession
	1	Invest in resources during recession

#### **4.8.5 Investment – Investment Maintenance**

Investment Maintenance comments made up 50% of Investment related responses and 2.3% of total responses. The comments are shown below in Table 4-26. A portion of the respondents interviewed mentioned that their companies purposefully used the recession as a time to invest in new efficiencies or diversity. However, the majority of interviewees admitted that their companies were forced into efficiency and diversity as a method of coping with the recession. Even so, interviewees reported that these companies did not wish to lose the efficiency and diversity they had gained, regardless of whether they were products of necessity or conscious investment. Companies created processes, reports, and other management tools to ensure that these investments were retained during the recovery.

**Table 4-26: Investment – Investment Maintenance Related Responses**

INVESTMENT MAINTENANCE		
Response Type	Response Rate	Responses
STRATEGIES	7	Maintain new efficiencies into recovery <sup>A</sup>
	7	Maintain new diversity into recovery
A: Use processes, matrices, reports, staffing, and management to maintain efficiencies gained in recession.		

#### 4.9 Organizational Learning Mechanisms

Organizational learning mechanisms were the processes, cultures, or programs that were employed, whether formally or informally, to collect, analyze, store, or disseminate knowledge throughout the company. Table 4-27 below lists the organizational learning mechanisms that were mentioned by respondents. They were grouped according to whether they most facilitated the collection, analysis, storage, or dissemination of knowledge. Many of the most common responses, such as employee surveys, informal communication, and general company meetings, were informal cultures or were not directly oriented toward lessons learned. Encouragingly, however, several responses indicated a proactive and formal approach toward organizational learning. These responses included formal lessons-learned meetings conducted at the completion of jobs, company intranet and other technology being utilized to retain the lessons learned, and employee leadership and innovation programs.

**Table 4-27: Organizational Learning Mechanisms**

<b>ORGANIZATIONAL LEARNING MECHANISMS</b>		
<b>Response Type</b>	<b>Response Rate</b>	<b>Responses</b>
<b>COLLECT</b>	17	Employee surveys
	15	Informal communication / open door policy
	13	Non learning-specific company meetings
	12	Employee interviews / reviews
	9	End of project lessons-learned meetings
	8	Technology / company intranet
	2	Suggestion box
	2	Client surveys
	2	Company retreats
	1	Executive job tours
<b>ANALYZE</b>	9	End of project lessons-learned meetings <sup>A</sup>
	7	Study industry trends
	7	Employee empowerment / ownership in problem solving and innovation
	3	Employee initiative committees
	3	Employee leadership and innovation programs
	2	Continual learning culture
<b>STORE</b>	8	Technology / company intranet <sup>A</sup>
	2	Centralize business functions
	2	Lessons learned record
<b>DISSEMINATE</b>	18	Training / mentoring programs
	15	Informal communication / open door policy <sup>A</sup>
	13	Non learning-specific company meetings <sup>A</sup>
	8	Technology / company intranet <sup>A</sup>
	7	Reports
	1	Increase management staff
	1	Company manual
	1	Company memos
	1	Company lessons-learned presentations

A: Organizational learning mechanisms are repeated as they may be used for multiple facets of the organizational learning process.

#### 4.10 Company Comparison

Respondents were asked to report on two Success Indicators in the interviews. These two Success Indicators were profit margins and how prepared the company may be for a future recession compared with how prepared it was for this recession. These were reported as Lickert scale questions that correlated to interview questions 1.6 and 1.7 in Section 3.6 – *Interview Questions*. They provided a basis for comparing company performance.

Respondents were asked to self-report their companies' success throughout the recession in terms of profit margins. These scores were tabulated below in Table 4-28. A score below 5 indicated that profit margins declined during the recession and had not yet reached pre-recession levels. A score of 5 indicated that profit margins currently matched pre-recession levels. A score above 5 indicated that profit margins currently exceeded pre-recession levels. Research found that the mean profit margin score was 3.74 and the median score was 3.50, indicating that, on average, company profit margins fell during the recession and had not yet returned to pre-recession levels. Eleven of the fifteen companies studied fell within 15% of the average. Two company scores fell significantly below this average at 3.00 each, indicating that these two companies experienced sharper than average decline in their profit margins. Two companies significantly exceeded this average at scores of 4.83 and 6.33, indicating that they experienced increases in their profit margins during or immediately following the recession.

**Table 4-28: Success Indicator – Relative Profit Margin Scores**

SUCCESS INDICATOR – RELATIVE PROFIT MARGIN SCORES																
COMPANY AVERAGE	1	2	3	4	5 <sup>A</sup>	6	7	8 <sup>B</sup>	9	10 <sup>B</sup>	11 <sup>A</sup>	12	13	14	15	
SCORE	3.74	3.50	3.33	4.25	3.50	3.00	3.33	3.50	4.83	3.38	6.33	3.00	3.50	3.50	3.50	3.63
A: Companies 5 and 11 received significantly lower than average Profit Margin Scores.																
B: Companies 8 and 10 received significantly higher than average Profit Margin Scores.																

Interviewees were also asked to self-report their companies' learning throughout the recession in terms of preparation for a future recession based on what had been learned and implemented during this recession. These scores were tabulated below in Table 4-29. A score below 5 indicated that the company was less prepared for a future recession than it was for the last recession. This would suggest that its learning process was unsuccessful. A score of 5 indicated that the company was equally prepared for a future recession as it was for this recession. This would imply that no significant learning occurred. A score above 5 indicated that the company would be more prepared for a future recession than it was for the most recent recession. This would insinuate that the company was successful in its endeavors to learn and improve throughout the recession. Research found that the mean score regarding preparation for a future recession was 7.19 with a median score of 7.17. This indicated that, on average, respondents felt their companies had learned lessons and implemented strategies that would make them more successful in a future recession. Thirteen of the fifteen companies studied had scores within 15% of this average. Company-11's score fell significantly below this average at 4.50, suggesting that respondents within the company felt it was less prepared for future

recessions. Company-8 scored significantly above the average at 9.00, indicating that the respondents were confident the company had improved significantly due to the lessons learned and strategies implemented in the recession.

**Table 4-29: Success Indicator – Future Recession Preparation Scores**

SUCCESS INDICATOR – FUTURE RECESSION PREPARATION																
COMPANY	AVERAGE	1	2	3	4	5	6	7	8 <sup>B</sup>	9	10	11 <sup>A</sup>	12	13	14	15
SCORE	7.19	8.83	7.50	6.88	6.33	7.17	7.50	6.50	9.00	7.25	6.50	4.50	6.88	7.00	8.00	8.00
A: Company 11 received a significantly lower than average Profit Margin Score.																
B: Company 8 received a significantly higher than average Profit Margin Score.																

Aside from Success Indicator Scores, companies were also given Organizational Learning Mechanism Scores (OLM Scores). Organizational learning mechanisms mentioned by the respondents were counted and ranked to give each company a score based on how they utilized organizational learning mechanisms. This was done by counting all references to mechanisms for the collection, analysis, storage, or dissemination of knowledge by the respondents within each company. Repeat responses within a company were not counted. Each mechanism was given a score of 1 to 3 based on its focus on learning and its formality. Formalized mechanisms (mechanisms that were regularly scheduled and produced a permanent record) that were directly focused on learning retention or development were given a score of 3. Lessons-learned meetings conducted at project completion were examples of this type of organizational learning mechanism. Formalized mechanisms that were not directly focused on learning but that

improved it as an ancillary benefit, or less formal mechanism that were directly focused on learning were given a score of 2. Such mechanisms included general company meetings and employee surveys. Informal mechanisms that were not directly focused on learning retention or development were given a score of 1. An example of this would be informal communication through an open-door policy.

These scores were tabulated below in Table 4-30. Scores ranged from 3 to 23 with the mean being 13.53 and a median at 15. Higher scores indicated a greater number of organizational learning mechanism being utilized within the company. This suggested that a greater amount of organizational learning may have occurred within the company. Eleven of the fifteen companies studied had organizational learning scores of 10 or above. Company-7 and Company-11 had Organizational Learning mechanism scores of 3 and Company-5 and Company-10 had OLM Scores of 5. Interestingly, the four companies with low OLM Scores made up four of the six smallest companies studied. The size of the company may correlate to the amount of organizational learning occurring within it, or to the formalization of these processes.

**Table 4-30: Success Factor – Organizational Learning Mechanism Scores**

ORGANIZATIONAL LEARNING MECHANISM SCORES																
COMPANY AVERAGE	1	2	3	4	5 <sup>A</sup>	6	7 <sup>A</sup>	8	9	10 <sup>A</sup>	11 <sup>A</sup>	12	13	14	15	
SCORE	13.53	14	15	20	16	5	21	3	16	23	5	3	10	13	22	17
A: Companies 5, 7, 10, and 11 received a significantly lower than average Organizational Learning Mechanism Scores.																

Company ages, sizes, and locations were compared to the Success Indicator Scores (profit margins and preparation for future recessions) but no direct correlation was found. The Success Indicator Scores were then compared to the Organizational Learning Mechanism Scores. A total of five companies (Company-5, Company-7, Company-8, Company-10, and company-11) had Success Indicator Scores significantly outside of the average or OLM Scores significantly lower than average. These companies were compiled below in Table 4-31 for further study.

**Table 4-31: Success Indicator and Success Factor – Company Comparison**

	COMPANY COMPARISONS					
	SUCCESS INDICATORS				SUCCESS FACTOR	
	Profit Margin Score		Preparation for Future Recessions Score		Organizational Learning Mechanisms Score	
Average	3.74		7.19		13.53	
Company 5	3.00	<b>LOW</b>	7.17	<b>LOW - AVG</b>	5	<b>LOW</b>
Company 7	3.50	<b>LOW - AVG</b>	6.50	<b>LOW - AVG</b>	3	<b>LOW</b>
Company 8	4.83	<b>HIGH</b>	9.00	<b>HIGH</b>	16	<b>HIGH</b>
Company 10	6.33	<b>HIGH</b>	6.50	<b>LOW - AVG</b>	5	<b>LOW</b>
Company 11	3.00	<b>LOW</b>	4.50	<b>LOW</b>	3	<b>LOW</b>

The data generally appeared to correlate except for Company-10. Company-10 appeared to have an inverse relationship between its Profit Margin Score and its Preparation for Future Recessions and OLM Scores. A brief study of this company explained this phenomenon. Company-10 was a construction company that had employed a great deal of organizational learning in its past. This learning created a business plan which involved reducing competition



by focusing on a niche market involving disadvantaged business enterprises. This company also chose to stop work for a year and a half rather than enter a low-bid scenario. These strategies allowed the company to operate at much higher than average profit margins. The decision not to participate in low-bid competitions also required a reduction of the majority of the staff during the recession. The small staff, including only one key decision maker during the majority of the recession, allowed the company to rely on individual learning rather than organizational learning. This explained the significantly lower than average OLM score. The score describing preparation for a future recession as compared to this recession was lower than average because the respondents mentioned that they were already well prepared for this last recession and so any improvement would be incremental.

Though Company-10's strategy provided impressive profit margin scores in the short term, the respondents stated that its business plan would not be feasible for most other companies. They further mentioned that the strategy would not maintain its feasibility as the company grew in the recovery, and a new business plan would need to be created. Respondents noted that future company growth would also preclude the company from reliance on individual learning. That individual learning would need to be converted to organizational learning through its collection, analysis, storage, and dissemination amongst the growing number of decision makers if the company was to continue to be successful as it grew.

With the anomaly of Company-10 explained, the remainder of the data in Table 4-31 provided noteworthy results. A general correlation was found between OLM Scores and Success Factor Scores. Those companies with significantly lower than average OLM Scores also tended to have lower Success Indicator Scores. The company with significantly higher than average Success Indicator Scores also had a high OLM Score. This suggests that there is a correlation

between organizational learning mechanism and Success Indicators. This led to the theory that organizational learning directly affects company success.

## 5 CONCLUSIONS AND RECOMENDATIONS

### 5.1 Organizational Learning Theory

Grounded Theory derives theory based upon the research performed rather than testing a predetermined theory against the data. Based upon the research performed, specifically upon the findings noted in Section 4.10 – *Company Comparison*, this research concluded that there was sufficient correlation in the data to create a theory. Of the fifteen companies studied, ten companies fell within 15% of the statistical mean in all of the categories used for the comparison between organizational learning and company success. The five companies with at least one Success Indicator (profit margin or preparation for future recessions) or Success Factor (organizational learning mechanism) Score greater than 15% outside of the average were compared. One company was disregarded from further comparison as an anomaly. At one point during the recession the leadership of this company relied solely on one individual, creating a situation in which company success may have been reliant on individual learning rather than organizational learning. The remaining four companies were all either consistently high or low in their Success Factors Scores and Success Indicator Scores. This consistency suggested a correlation between the success factor (organizational learning mechanisms employed) and company success (measured by relative profit margins and preparation for future recessions). As a result, this research concluded with the following theories:

- The use of organizational learning mechanisms within companies increased their level of organizational learning and consequently improved their success.
- Inversely, neglecting to use organizational learning mechanisms impeded companies' organizational learning and hindered their success.

These theories are to be considered informationally, rather than statistically, significant. They concur with academic research into organizational learning, but go beyond the academic setting to provide a base upon which organizational learning may be practically applied in the construction industry to improve its performance. Further study on this subject should test these theories to determine their statistical significance to the industry.

## **5.2 Recommendations for Company Operation during Economic Cycles**

Based upon the responses given by interviewees, a series of recommendations were created as suggestions for companies to explore during different periods of economic cycles. These include periods of good economic activity (Up Markets), periods of poor economic activity (recessions), and the transition periods between them (entering a recession or a recovery). These recommendations were based upon the general consensus of the interviewees, but also included less mentioned strategies that companies may consider employing.

### **5.2.1 Recommendations for Up Markets**

Diversification was the most mentioned topic at 13.6% of total responses. Though respondents stated that they diversified during the recession, many noted that pre-recession diversification provided significantly greater success to the company. Interviewees mentioned that companies attempting to diversify during the recession, without the appropriate resumes and

relationships, were forced to enter low-bid competitions. This led to reduced profits and potential financial loss. Diversification in an up-market, when competition for jobs is significantly decreased, allows companies to enter new markets, regions, or client types at prices that allow for contingencies to overcome any problems that the lack of familiarity may cause.

It is recommended that companies look to diversifying in market sectors and client types before exploring geographic diversification. Companies can identify countercyclical market sectors and client types more readily than geographic regions. Market sectors and client types can also be entered into without a significant increase in overhead costs. Regional diversification, though certainly a potential option, carries an increased risk and cost over other forms of diversification. As companies diversify, they may consider opening new offices or divisions. Companies should consider the benefits and risks of maintaining centralized support services such as marketing, administration, business development, or even preconstruction in order to reduce the increase overhead that diversification can cause.

It is important for companies to maintain their skills, resumes, and relationships in the various market sectors, client types, or geographic locations that they choose to diversify into. One such skill that should be maintained is the ability to estimate work for hard-bid scenarios. Focusing on one successful area, to the detriment of relationships and experience in other areas, may lead to out-of-date resumes and relationships. This can hinder the company's ability to win work in a more competitive environment. Maintaining resumes and relationships may require that companies perform work that is small, riskier, or less profitable than the work generally performed by that company. Though each company must decide what course of action is appropriate, it is suggested that companies consider performing this work to maintain their relationships and resumes.

As companies grow during up markets, they may consider tempering that growth, even at the cost of immediate profits, to ensure that the company culture is not lost. The loss of efficiency during periods of rapid growth may be most detrimental. As companies hire new employees to meet demand, care should be taken to confirm that employees are properly trained on company processes and culture. Further efforts should be made to cross-train employees on various aspects of the business or on various product types. If manpower must be reduced during a recession, cross-trained employees become more valuable as they are able to perform the tasks of coworkers that are no longer with the company.

A company may be tempted to increase its debt in an effort to escalate its rate of growth to meet demand in the up market. Though this strategy allows for gains in market share and revenues, growing at a more deliberate pace may reduce risk of being overextended as the market slows. Respondents suggested that companies instead use good economic conditions to reduce debt and build cash reserves.

As this research has shown a correlation between organizational learning and company success, it is strongly recommended that companies use good economic times as an opportunity to create, implement, and refine organizational learning mechanisms. A list of potential organizational learning mechanisms can be found in Table 4-27: Organizational Learning Mechanisms. This list is not comprehensive, and companies need not implement every organizational learning mechanism listed, but companies should create formal processes through which knowledge can be collected, analyzed, stored, and disseminated. The increase in resources that companies generally experience during periods of good economic conditions make them ideal for the implementation of these processes.

### **5.2.2 Recommendations for Start of Recession**

During good economic times companies should invest in knowledge of economic principals, trends, and forecasts. Sufficient investment in this area may provide advanced knowledge of an impending recession. Though precise forecasts of future recessions may not be available, companies should still follow the advice of respondents indicating that the longer an up cycle lasts, the more important it is to prepare for the inevitable down cycle. As signs of a potential recession occur, companies should aggressively seek to bolster their backlog of work. Companies may consider focusing this backlog on public works or large institutional clients that generally continue to build during recessions. Respondents noted that their backlogs of work funded by private investors diminished significantly during the recession. If they have not already done so, companies should prepare a recessionary business plan and communicate it with their employees. This plan should include various financial and other indicators that, when triggered, will prompt cuts or other actions by the company to proactively deal with the effects of the recession. Doing so will prevent the company from following a course of action or delaying necessary changes to its detriment.

Efforts should be made to increase cash on hand by increasing incoming cash and decreasing unnecessary expenditures. This may involve reducing inefficiencies that have formed during the up cycle, being more proactive in billing and collecting receivables, or reducing overhead.

### 5.2.3 Recommendations for Down Markets

If companies have prepared carefully during the up market and the start of the recession, the recession may provide opportunities in addition to its inherent risks. As quoted earlier in this research:

Companies which have cash in hand and low debt ratios are in a position to invest in efforts to grab market share that their cash poor, high debt competitors may not be able to defend against. The market share that these companies pick up in a recession is likely to remain theirs in good times. In addition, those companies with available cash can negotiate better prices and delivery dates than those companies which are not paying cash up front. This will allow these companies to reduce costs even further. Recessions also offer firms the opportunity to pick up top notch talent from their competitors, as employees can generally be coaxed to switch companies rather than risk layoffs at their present locations. Finally, managers can find investment opportunities that simply do not exist in good times. Companies can purchase carefully selected businesses at bargain basement prices as panicked companies attempt to sell assets in order to raise cash (Bigelow et al. 1992).

Respondents generally did not refute these claims, but few had companies that were in positions to fully take advantage of them. However, there were a few notable exceptions to this. Five respondents mentioned upgrading staff during the recession, one respondent mentioned purchasing equipment during the recession, three respondents mentioned increasing market share by opening new offices or divisions during the recession, and six respondents mentioned other general resource and process investment. Comments on investment during the recession made up only 2.5% of total responses. This suggests a profound lack of organizational preparedness for recession.

Companies that are unable to make beneficial investments during the recession can still create strategies that protect themselves and minimize the effects of the recession. These recommendations fall under the categories of Contracting, Cost-Control, Financial, Human Resources, and Risk Management.



#### **5.2.4 Contracting Recommendations for Down Markets**

As competition for work increases in a recession, it is important to have invested, and to continue investments, in preconstruction. Adequate training and use of technology may facilitate cost savings, owner relationships, and risk management. Clients are reported to be more demanding in cost and schedule during and after a recession. This further emphasizes the need for intensive preconstruction efforts. Preconstruction efforts may be expanded to include project facilitation. Companies may connect potential clients with lending partners or provide free or reduced project feasibility and preconstruction services. This strategy may be especially effective for less sophisticated clients that may not have sufficient financial relationships or in-house construction budgeting abilities to create the projects without the contractor's assistance.

Companies should have already diversified into countercyclical client types and market sectors during the recession such as institutional clients and public works projects. During the recession these types of projects and clients will remain more stable, or even increase demand. Resources should be shifted to capture this work. Though companies may shift markets and clients types during the recession to capture countercyclical work, it is important to maintain relationships and resumes with existing clients and in core markets. This may require performing such work at reduced profits and increased risk. Companies must take care to maintain these relationships and resumes without incurring significant losses.

Companies should seek to perform repeat work whenever possible. This may include job-order contracting for a large institutional client or other forms of repeat work. This symbiotic relationship can reduce cost and risk for both the company and the client by reducing project mobilization costs, eliminating bidding costs, and increasing project team familiarity.

### **5.2.5 Cost-Control Recommendations for Down Markets**

Companies should have made efforts to operate and grow efficiently during the up market. However, there will likely be some inefficiencies that have formed over time. These inefficiencies should be immediately addressed during the recession. Further cuts, such as staff or salary reductions should be tied to financial or other indicators. Plans for the restoration of these cuts should also be tied to quantifiable indicators. This information should be communicated to employees to avoid any undue damage to employee morale or loyalty.

### **5.2.6 Financial Recommendations for Down Markets**

Companies should carefully consider their thresholds for risk and profit margins. These thresholds should be maintained even at the loss of work. Respondents emphatically stated that performing work at too low a profit margin for the associated risk was one of the key factors in insolvency in the industry. Companies should also carefully monitor billing and cash flow.

### **5.2.7 Human Resources Recommendations for Down Markets**

It is recommended that companies pay special consideration to employee growth, loyalty, and morale in the recession. Though manpower reductions may be necessary, they should be done judiciously and openly. Communication to employees about manpower reduction, salary reduction, their associated triggers, and the conditions required for the reinstatement of cuts will reduce employee uncertainty, which should reduce employee turnover and production loss.

Assuming that the company has reduced debt and increased cash reserves during the up market, it is recommended that capacity be maintained as much as is feasible, even if the company must carry some key employees. Employees lost during the recession may leave the

industry or join competing companies. Companies attempting to re-staff during the recovery may be faced with manpower shortages, significant training expense, and lower quality employees. Key employees that are retained, but not currently assigned to projects can be used to improve training, processes, or other innovations. This presents another opportunity for companies to focus on the creation and implementation of organizational learning mechanisms.

### **5.2.8 Risk Management Recommendations for Down Markets**

Risk management provides one of the most significant areas of recommendations during the recession. At reduced profits margins, budgets, schedules, and manpower, the consequences of unforeseen or unmitigated risk can be drastic. Investments in preconstruction risk identification and mitigation may increase overhead at a time when most overhead is subject to cuts, but the potential consequences outweigh this cost.

Subcontracting was generally termed the biggest risk in a recession, specifically subcontractor default or nonperformance. Contractors can mitigate this risk by maintaining subcontractor relationships and using those subcontractors with which it is familiar. Companies should endeavor to continuously develop relationships and familiarity with new subcontractor with potential to partner on future work. Companies should create a stringent prequalification and vetting processes that subcontractors must pass to be used on a project. Subcontractor bids, scopes, payment applications, lien releases and union letters should be carefully scrutinized. When feasible, contractors or owners can purchase subcontractor default insurance, though bonding and contingencies may still be more appropriate for some projects.

Unfamiliarity was another often mentioned risk in the recession. For this reason, companies should diversify during the up market when increased profit margins and budgets can

offset any losses taken on an unfamiliar project. Entering new market sectors, geographic locations, or client types should be done on a smaller scale before large projects are pursued. This decreases the likelihood that a failure on an unfamiliar project will mortally damage the company as a whole.

### **5.2.9 Recommendations for Start of Recovery**

Companies should be adequately prepared for the recovery if they have maintained sufficient capacity and focused on employee training, development, and morale during the recession. The recovery provides an opportunity for dissatisfied employees to find alternative employment. Employee retention and satisfaction should be carefully addressed during this period. The efforts to communicate with and develop employees during the recession should minimize this risk.

Different market sectors will most likely improve at different rates and times during the recovery. Though companies should be diverse enough to take advantage of those markets that are experiencing the most robust recovery, this should not come at the expense of maintaining resumes and relationships in a diverse range of market sectors.

### **5.3 Non-Traditional Reactions**

**Contractors Facilitate Job Creation:** One unique response was the creation of projects by the contractor. The contractor provided banking and investment relationships to the client to help facilitate the project funding process. The company also provided free or reduced preconstruction and project feasibility services to further aid the creation of the project and ensure that that company would build it. This company dealt with many small and less

sophisticated clients with fewer financial connections than the company. This strategy may not be as successful for larger companies with a more sophisticated client base.

**Countercyclical Clients:** Companies may not have the resources to diversify into countercyclical markets. Diversification into countercyclical client types may provide a successful alternative. One such respondent mentioned that his company experienced increased construction of commercial buildings for a client which sold mining and industrial equipment. As precious metals and natural resource prices rose during the recession, the client's revenue and business increased to the point of requiring additional work and retail space, which the commercial contractor was able to provide.

**Market from Within:** Rather than spend money on an outside marketing consultant or an internal marketing division, one company created a networking program through its employees and business partners to find work through personal and business relations.

**Low Competition Niche Businesses:** One respondent indicated that his company focused on a niche market sector which reduced competition and increased profit margins. The niche business model included disadvantaged business classification to take advantage of government set-asides. The other respondent stated that specializing in more complex projects opened the door to negotiated work, even during recession. Complex projects involved highly technical construction, reduced schedules, or highly regulated buildings

**Cuts Triggered by Indicators:** One company in particular mentioned creating business plans during the recession which had specific triggers tied to various performance indicators. If a performance indicator was triggered, revenues falling below a certain point for example, the company would automatically carry out a pre-planned cut or change to ensure that the business remained financially viable. This forced the company to avoid delaying critical decisions

**Multi-Prime Contracts:** One respondent mentioned that his company had engaged in multi-prime contracts during the recession to reduce the risk posed by subcontractors. In this delivery method, the general contractor contracted with the client in a construction manager roll. Consequently, the subcontractors contracted with the client rather than the general contractor. The general contractor was then paid a stipulated fee for its services as construction manager and the client assumed any risk or savings from the subcontractors. This approach reduced the potential overall profit for the project, but it also greatly reduced the potential risks to the general contractor.

**Project Managers Perform Preconstruction:** One respondent mentioned that within his company, project managers performed preconstruction services on their own projects. The respondent noted that though this approach may have reduced company overhead, its major benefit was the continuity between preconstruction and construction that avoided misinterpretations and miscommunications about project scope, budget, schedule, or other coordination.

#### **5.4 Recommendations for Future Study**

As this research used Grounded Theory to derive a theory from the data rather than test an existing theory against the data, future research should carry out this next step. This research concluded with the theory that the implementation of organizational learning mechanisms increase a company's level of organizational learning and improve its performance. This theory should be further tested using quantifiable data and statistical evaluation.

This research also focused on organizational learning in general rather than make the distinction between double-loop and single-loop learning. Future research should study the two

levels of learning, identify which companies are performing higher levels of learning, and compare the companies' performance.

Additional research into the individual lessons learned or strategies created would be of benefit to the industry. Employee morale and loyalty, for example, provides a topic rich with possibilities. A study of the costs, both direct and indirect, of employee turnover as well as the most successful methods of employee retention would provide significant knowledge and benefit to the industry.

## REFERENCES

- Arditi, D., S. Kale, and M. Tangkar, "Innovation in Construction Equipment and Its Flow into the Construction Industry," *Journal of Construction Engineering and Management* 123, no. 4 (Dec 1997): 371-378.
- Bigelow, R. and P.S. Chan, "Managing in difficult times: Lessons from the most recent recession," *Management Decision* 30, no. 8 (1992): 34-42.
- Brikci, N. and J. Green, "A Guide to Using Qualitative Research Methodology," *Medecins Sans Frontieres* (Feb 2007):1-31.
- Chan, P., R. Cooper, and P. Tzortzopoulos, "Organizational learning: conceptual challenges from a project perspective," *Construction Management and Economics* 23 (Sept 2005): 747-756.
- Creswell, J.W., *Research Design: Qualitative & Quantitative Approaches* (Thousand Oaks: SAGE Publications, Inc. 1994), 42-140.
- Dansoh, A., "Strategic planning practice of construction firms in Ghana," *Construction Management and Economics* 23 (Feb 2005): 163-168.
- Geroski, P. and P. Gregg, "Corporate Restructuring in the UK during the Recession," *Business Strategy Review* 5, no. 2 (Summer 1994): 1-19.
- "Guide to Size Standards," The U.S. Small Business Administration, accessed Aug, 1 2014, <http://www.sba.gov/offices/headquarters/ocpl/resources/14104>.
- Gulati, R., N. Nohria, and F. Wohlgezogen, "Roaring Out of Recession," *Harvard Business Review* 88, no. 3 (Mar 2010): 62-69
- Hadi, A., "Construction employment peaks before the recession and falls sharply throughout it," *Bureau of Labor Statistics: Monthly Labor Review* (Apr 2011): 24-27.
- Jick, T.D., "Mixing Qualitative and Quantitative Methods: Triangulation in Action," *Administrative Science Quarterly* 24, no. 4 (Dec 1979): 602-611.
- John, K., L.H.P. Lang, and J. Netter, "The Voluntary Restructuring of Large Firms in Response to Performance Decline," *The Journal of Finance* XLVII, no. 3 (Jul 1992): 891-917.



- Kim, L., "Crisis Construction and Organizational Learning: Capability Building in Catching-up at Hyundai Motor," *Organization Science* 9, no. 4 (Aug 1998): 506-521.
- Kululanga, G.K., A.D.F. Price, and R. McCaffer, "Empirical Investigation of Construction Contractors' Organizational Learning," *Journal of Construction Engineering and Management* 128, no. 5 (Oct 2002): 385-391.
- Kululanga, G.K., F.T. Edum-Fotwe, and R. McCaffer, "Measuring construction contractors' organizational learning," *Building Research and Information* 29, no. 1 (2001): 21-29.
- Lansley, P., "Corporate strategy and survival in the UK construction industry," *Construction Management and Economics* 5 (1987): 141-155.
- Lester, S., "An Introduction to phenomenological research," Stan Lester Developments (1999): 1-4.
- Levitt, B. and J.G. March, "Organizational Learning," *Annual Review of Sociology* 14 (1988): 319-340.
- Lim, B.T.H., B.L. Oo, and F. Ling, "The Survival Strategies of Singapore Contractors in Prolonged Recession," *Engineering, Construction and Architectural Management* 17, no. 4 (2010): 387-403.
- Lipshitz, R., M. Popper, and S. Oz, "Building Learning Organizations: The Design and Implementation of Organizational Learning Mechanisms," *The Journal of Applied Behavioral Science* 32, no. 3 (Sept 1996): 292-305.
- Love, P.E.D., H. Li, Z. Irani, and O. Faniran, "Total quality management and the learning organization; a dialogue for change in construction," *Construction Management and Economics* 18 (2000): 321-331.
- Pearce, J.A. II and S.C. Michael, "Strategies to prevent economic recessions from causing business failure," *Business Horizons* 49, no. 3 (May-Jun 2006): 201-209.
- Popper, M. and R. Lipshitz, "Organizational Learning Mechanisms: A Structural and Cultural Approach to Organizational Learning," *The Journal of Applied Behavioral Science* 34, no. 2 (Jun 1998): 161-179.
- Price, A.D.F. and E. Newson, "Strategic Management Consideration of Paradoxes, Processes, and Associated Concepts as applied to Construction," *Journal of Management in Engineering* 19, no. 4 (Oct 2003): 183-192.
- Reeves, M. and M.S. Deimler, "Strategies for winning in the current and post-recession environment," *Strategy and Leadership* 37, no. 6 (2009): 10-17.

- “Regions and Divisions,” U.S. Department of Commerce Census Bureau, Last updated May 6, 2014, accessed June 30, 2014, [http://www.census.gov/econ/census/help/geography/regions\\_and\\_divisions.html](http://www.census.gov/econ/census/help/geography/regions_and_divisions.html).
- Roberts, K., “What strategic investments should you make during a recession to gain competitive advantage in the recovery?” *Strategy and Leadership* 31, no. 4 (2003): 31-39.
- Sandelowski, M., “Focus on Research Methods: Combining Qualitative and Quantitative Sampling, Data Collection, and Analysis Techniques in Mixed-Method Studies,” *Research in Nursing and Health* 23, no. 3 (2000): 246-255.
- “Single-Loop and Double-Loop Learning Model,” ICL Resources, Posted November 13, 2012, accessed May 28, 2014, <http://www.afs.org/blog/icl/?p=2653>.
- Strauss, A. and J. Corbin, “Grounded Theory Methodology: An Overview.” *Handbook of qualitative research* (1994): 273-285.
- Tansey, P., X. Meng, and D. Cleland, “A Critical Review of Response Strategies Adopted by construction Companies During and Economic Recession,” *Procs 29<sup>th</sup> Annual ARCOM Conference*, Reading, UK, Association of Researchers in construction Management (2-4 Sept 2013): 679-689.
- Williamson, P.J. and M. Zeng, “Value-for-Money Strategies for Recessionary Times,” *Harvard Business Review* 87, no. 3 (Mar 2009): 66-74
- Wong, P.S.P., S.O. Cheung, R.L.Y. Yiu, and M. Hardie, “The unlearning dimension of organizational learning in construction projects,” *International Journal of Project Management* 30 (2012): 94-104.
- Wong, T.K. and R.D. Logcher, “Contractors in cyclical Economic Environments,” *Journal of Construction Engineering* 112, no. 3 (Sept 1986): 310-325

## Organizational Learning in Utah Commercial Construction during Economic Recession

Evan Danforth and Justin Weidman, Ph.D. and Clifton Farnsworth, Ph.D., PE.  
Brigham Young University  
Provo, Utah

Organizational learning, the process through which organizations gain and utilize knowledge, has been shown to directly affect an organization's performance improvement efforts. Existing research on organizational learning suggests that double-loop learning has a greater impact on an organization's performance improvement than does single-loop learning. This existing research also indicates that organizations as a whole, and construction companies in particular, rarely employ double-loop learning. It is suggested that drastic changes in an organization's environment, such as economic recession, may necessitate, and therefore facilitate, double-loop learning. This research studied the organizational learning of five Utah based commercial construction companies during the 2008-2009 U.S. recession through semi-structured interviews. It was found that the two companies that exhibited double-loop learning were the only two companies in the study that exhibited growth during the recession. The contribution of these findings is to increase the understanding of organizational learning in the construction industry and identify the potential role of double-loop learning in performance enhancement.

**Key Words:** Organizational learning, Single-loop learning, Double-loop learning, Construction, Recession

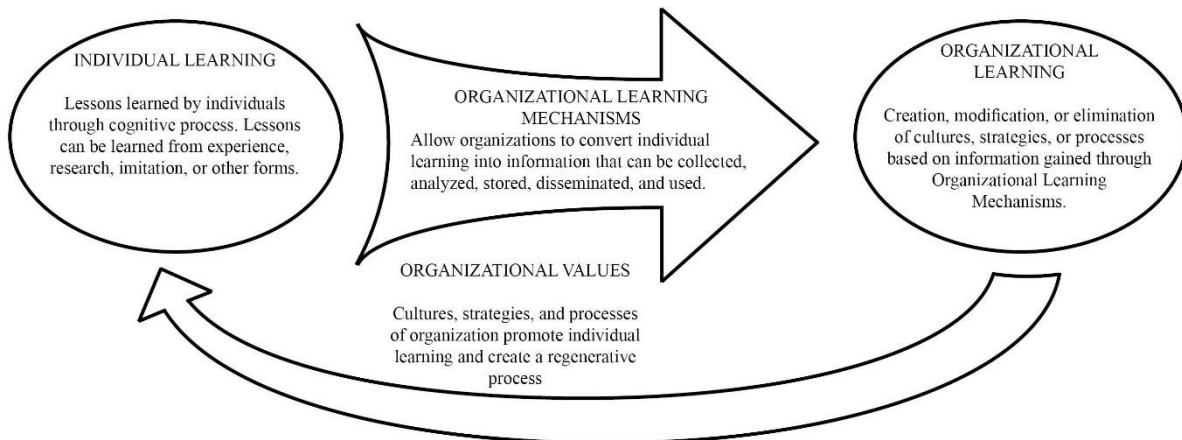
### Introduction

Valuable experience is gained by individuals who weather economic downturns with their companies. If this experience is not absorbed into the company's organizational structure in a meaningful way, it may be inaccessible for use during future market downturns. As with most industries, construction is cyclical. As general economic conditions worsen, demand for construction services decreases, leading to insolvency, job loss, and economic drain. Without adequate preparation, the subsequent recovery can be equally detrimental. As companies with reduced operational capacity and capital attempt to meet the increasing demands for their services, the lack of liquidity and qualified personnel can lead to negative cash flow, poor performance, or similar complications. Current practices in the construction industry do not appear to have improved the industry's outlook during hard times. Organizational learning can incorporate the individual knowledge, skills, and experience gained during such difficult times into the organizational structure of the company. Companies need to retain these lessons-learned and employ them prudently to better withstand future economic upheaval. Though many construction companies are able to learn from past experience, this learning is generally applied toward incremental changes in behavior rather than drastic paradigm shifts in the underlying principles that guide behavior. This lack of innovation has trapped the majority of the

construction industry in an effort to perform better within economic cycles rather than to escape these cycles. This study analyzed the organizational learning of five Utah based commercial construction companies. Levels of learning and their effect on the company were identified. Such information highlights the need for, and lack of, high level learning within the construction industry.

## Background

At its most basic definition, organizational learning describes the process by which organizations acquire and utilize knowledge. The most practicably applicable explanation of organizational learning is provided by Lipshitz in his suggestion “that learning by organizations occurs when individual learning... occurs within the context of Organizational Learning Mechanisms that ensure that people get the information they need and that the products of their reflections are stored and disseminated throughout an organization” (Chan, Cooper, & Tzortzopoulos, 2005, p. 749). Organizational Learning Mechanisms are described by Lipshitz, Popper, and Oz (1996) as “institutionalized structural and procedural arrangements that allow organizations to systematically collect, analyze, store, disseminate, and use information that is relevant to the effectiveness of the organization” (p. 293). Organizational learning differs from individual learning, but cannot occur without it. An organization, of itself, cannot learn. Learning takes place within the minds of individuals (Lipshitz et al., 1996). As demonstrated in Figure 1, organizational learning takes place when the culture, values, and processes of the organization encourage individual learning, then collect and disseminate their newly acquired knowledge throughout the company. This transformation from specific individual knowledge to general company knowledge creates a learning organization rather than a collection of learning individuals (Love, Li, Irani, & Faniran, 2000).



### Organizational Learning Process

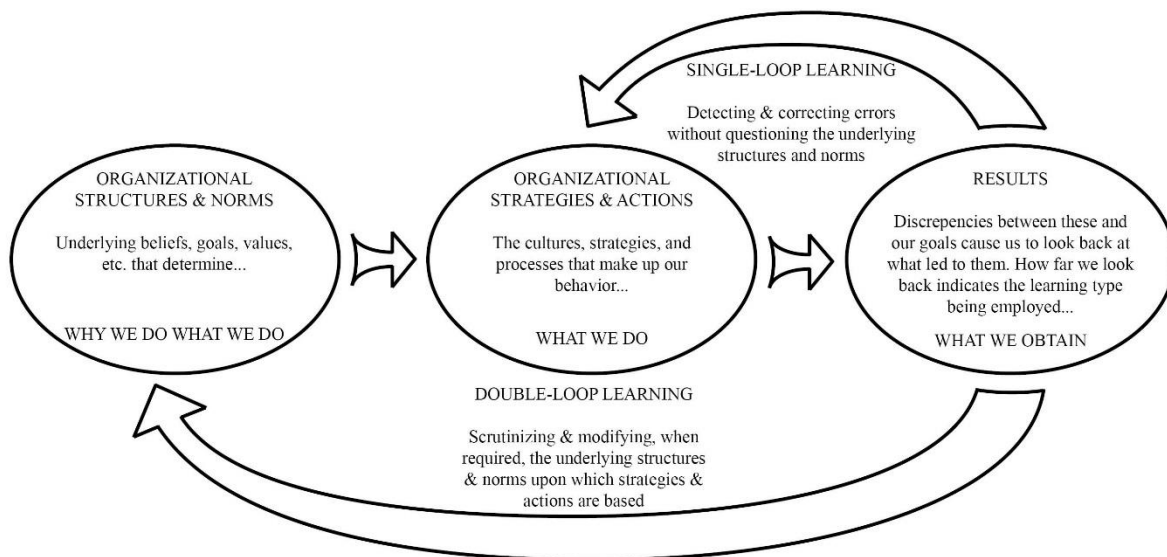
#### *Levels of Organizational Learning*

Organizational learning is often categorized into single-loop and double-loop learning. Single-loop learning, as demonstrated in Figure 2, detects and corrects errors without questioning the organizational structures and norms that may have initiated them. It may be considered as a lower level of organizational learning. Single-loop learning is often characterized by working under a set of clearly identified project goals and interpreting feedback on the success of achieving those goals based on past experience (Wong, Cheung, Yiu, & Hardie, 2012). This approach is the most commonly used in business at-large and even more so in the construction industry. It is advantageous in that it fits conveniently into the current corporate structure, and its execution is straightforward – fix problems as they occur. Single-loop learning is able to improve the organization’s performance and knowledge base without

requiring drastic changes to the culture of the organization. There are, however, three significant weaknesses to single-loop learning:

- The errors corrected may only be symptoms of greater underlying problems with the existing organizational norms, but these are not questioned (Love et al., 2000).
- The process of acquiring knowledge in this manner does not allow the organization’s knowledge to change rapidly with its environment. The culture, strategy, and process created, or knowledge attained, may no longer be in line with the requirements of the environment since the environment has continued to evolve while the knowledge is processed. It is at this point that unlearning may need to occur in order to achieve double-loop learning (Wong et al., 2012).
- Single-loop learning is not a self-sustaining process. There is no built-in system of continuous learning or improvement. Single-loop learning is initiated when a problem occurs and ends when that problem is perceived to be fixed (Love et al., 2000).

Double-loop learning, on the other hand, scrutinizes and modifies the underlying norms or structures within an organization. Argyris and Schone stated that “changing beliefs and routines are preconditions for organizations to improve by developing new strategies. Double-loop learning refers to a change of performance improvement actions taken after reviewing the need to change the underlying assumptions that have caused errors or deficiencies” (Wong et al., 2012, p. 100). “Double-loop learning activities are manifested in the form of paradigm shifts of organizational protocols, technology, operation, and culture as a precursor for effective and efficient construction business processes” (Kululanga, Price, & McCaffer, 2002, p. 386). As demonstrated in Figure 2, double-loop learning identifies the root of a problem before taking improvement action; it seeks and adopts new management and working approaches through the evaluation of current practices (Wong et al., 2012). It is self-sustaining in that “[t]he processes are designed for continuous responsiveness, ongoing learning, and the use of feedback loops to fuel future decisions” (Love et al., 2000, p. 328).

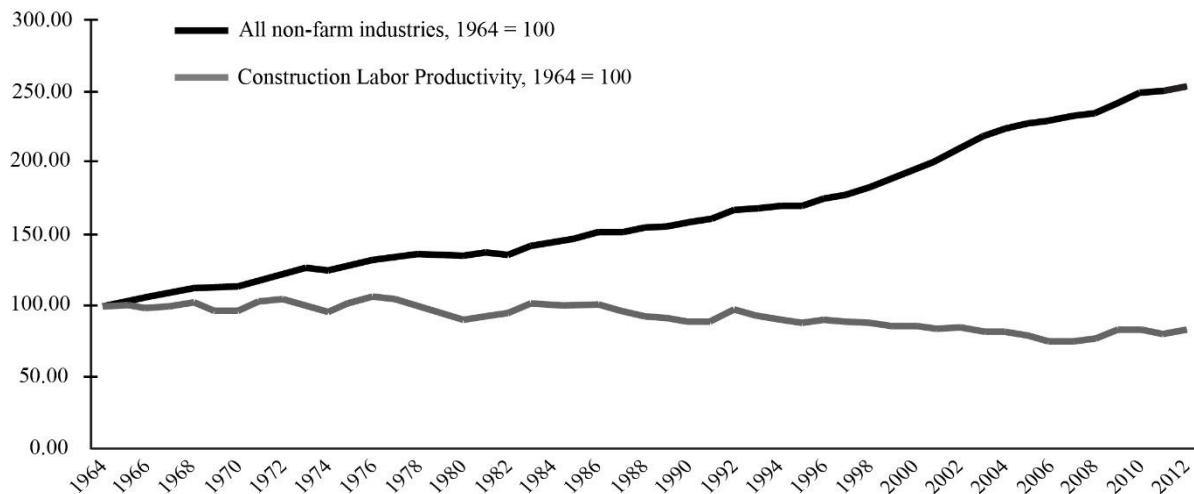


Single & Double-Loop Learning - Adapted from ICL Resources (2012)

Double-loop learning generally differs from single-loop learning by asking, “Why?” Single-loop learning involves changing and improving an organization’s behavior, while double-loop learning asks why that behavior is occurring. This can be related to construction in the transition of many organizations from the design-bid-build delivery model to design-build, design-assist, or even integrated project delivery. At some point, stakeholders asked, “Why are the future builders of a project uninvolved in its design?” Such questions create an environment in which outdated or

incorrect assumptions can be replaced by new, more accurate paradigms, ultimately resulting in a greater improvement in performance. “The key to powerful breakthroughs is not simply to change your behavior –it’s not enough to change your attitude; it’s necessary to change how you see the world, your paradigm, the assumptions you make... [I]f you want to make small, incremental changes, work on behavior or attitude. However, if you want to make quantum changes or improvements, work on paradigms” (Marcum, Smith, & Khalsa, 2002, p. viii).

Practicing double-loop learning has been shown to have a greater impact on performance than single-loop learning, yet most organizational learning exhibited in construction is single-loop learning (Wong et al., 2012). This is thought to occur because “not many organizations are capable of learning in an introspective manner... [They] rarely accept an operational change that does not fit their core values” (Wong et al., 2012, p. 95). Double-loop learning requires that old knowledge, beliefs, cultures, or routines be removed or changed as they become obsolete, a process called unlearning. The routines of a company have been developed over a long period of time, and discarding or changing them may be difficult. As such, most construction entities do not achieve double-loop learning (Wong et al., 2012). The effects of this shortcoming are pronounced. A review of the construction industry’s labor productivity since 1964, as show in Figure 3, paints a startling picture. The productivity of the construction industry has actually fallen in comparison to all other non-farm industries.



Construction Labor Productivity – Adapted from Teicholz (2013)

### *Economic Recession as a Catalyst for Organizational Learning*

“The rate and type of technological change in an industry are the result of environmental dynamics acting on that industry. A host of environmental factors put pressure on firms to generate and implement innovations” (Arditi, Kale, & Tangkar, 1997, p. 373). As the environment changes, successful companies will follow. Proactive companies may even change in anticipation of environmental change. Buckler states that an organization must have a capacity to learn that exceeds the rate of change imposed by the external environment in order to be successful (Love et al., 2000). Therefore, in a static environment, incremental single-loop learning may be sufficient for the continuous improvement and success of an organization. However, a rapidly changing environment may force or facilitate radical change, potentially enabling double-loop learning.

Lipshitz, Popper, and Oz (1996) identified four preconditions that may support or encourage organizational learning. “First organizations that operate in unstable and competitive environments need to improve continuously to survive. Hence these organizations... invest considerable resources in learning mechanisms that allow them to stay ahead in their fields... Second, organizations in which the cost and salience of errors are high are motivated to learn to avoid such errors” (p. 300-301). These preconditions are copiously satisfied by the nature of the construction industry and the environment created by recessions. Given these two conditions one could assume that a great deal of organizational learning occurs in the construction industry. However, the third and fourth conditions may either support or undermine that assumption. They are “third, organizations with a leadership committed to learning invest

considerable resources in developing OLMs [Organizational Learning Mechanisms]” (Lipshitz et al., 1996, p. 301), and fourth, the professionalism of the organizational members. Though professionalism involves numerous attitudes and attributes, “an important criterion by which professionals are evaluated (particularly among peers) is the extent to which they keep abreast of the state of the art in their fields” (Popper & Lipshitz, 1998, p. 176). It is these latter two preconditions, leadership and professionalism, that often separate a learning from a stagnant organization.

Though environmental factors play a large part in recession era management for construction companies, leadership which has planned for such an event can find opportunities in such turmoil. In a recent study on recession era management, Pearce and Michael noted that “perhaps the most important implication of our findings for theory is that recession-induced declines in the market value of resources not only create new threats, they provide important new opportunities. Recessions generate both an operating effect and a strategic effect. The operating effect is that the decline in resources affects our firm; the strategic effect is that the decline affects all firms. By being better able to conserve, maintain, and attract resources relative to competitors during recession, and to deploy those resources to capture customers, competitive advantage can be built” (Pearce & Michael, 2006, p. 209). Studies conducted by both McKinsey & Company and Boston Consulting Group further confirm this. Though “around a third of the companies in the first quartile of their industries tumbled from their perches during the 2000 slowdown... 15% of today’s market leaders vaulted to the top during that recession” (Williamson & Zeng, 2009, p. 66).

## Methodology

The purpose of this research was to identify whether double-loop learning occurred in Utah commercial construction companies during the most recent recession, and how it affected the overall well-being of each company. Due to the exploratory nature of the research, a combined Qualitative/Quantitative approach was employed using Grounded Theory Methodology. In Grounded Theory, the researcher begins data collection with no preconceived theories and conducts multiple rounds of data collection from which theories are generated. As subsequent rounds of data collection are completed, theories are initially generated, elaborated upon, or modified as the new data suggests. In this way, the concluding theories are derived from, rather than tested against, the data collected. This paper covers the first round of sampling and therefore conclusions are preliminary.

In order to achieve comparable information across multiple companies while still achieving variation within the sample, Stratified Purposeful Sampling was used. Stratification divides members of a sample population into homogeneous groups for sampling. This research stratified respondents according to positions within their company so as to maintain the aforementioned comparability. Purposeful, rather than random, sampling allowed for the pre-selection of variables such as company type, company size, geographic location, and position of respondent within the company. This initial round of data collection sought maximum comparability within a small sample size. As such, respondents were selected to meet the following criteria: Company Managers of a commercial construction company with annual revenue over \$50 million, based in Utah, holding membership in a professional contractor’s association. Respondents within the companies were required to hold a position of vice-president or higher. Respondents included one Chairman of the Board, two Presidents/CEOs, one Executive Vice-President, and one Vice-President. The data was collected through a series of semi-structured interviews which included specific questions to be answered, but allowed for follow-up questions and clarification. Interviews consisted of both open-ended and Likert scale questions. Open-ended questions allowed for a wide variation in experiences, while the Likert scale questions provided a quantitative basis for comparing performances of the companies (Jick, 1979). Below are the interview questions asked.

- 1 What business lessons were learned in attempting to improve your company’s outlook during the 2008-2009 U.S. recession?
- 2 Why was this approach successful?
- 3 What strategies did you try that were not successful (if any)?
- 4 How have these changes affected your company during the recovery?
- 5 What systems, programs, or culture (if any) does your company use to get feedback from employees?
- 6 On a scale of 1 to 10, 1 being significantly worse and 10 being significantly better, how are your profit margins now as compared to before the recession?

- 7 On a scale of 1 to 10, 1 being significantly worse and 10 being significantly better, how do you feel that your company is positioned for future recessions because of these changes?
- 8 Do you have any other lessons or advice that you feel would be pertinent to research on lessons learned from the recession?

Interviews were recorded and transcribed for accuracy. All lessons and strategies mentioned in the interviews were compiled into a master database. Similar lessons or strategies were combined and the number of respondents to mention them were counted. Each item on the resulting list was analyzed to determine whether it constituted single or double-loop learning. Items were determined to be single-loop learning if they involved a modification of behavior or attitude. Items were determined to be double-loop learning if they involved a paradigm shift in how the company viewed some aspect of its organization or environment.

## Results

A review of organizational learning literature concluded that double-loop learning is rarely utilized by organizations in general, and becomes even more infrequent in the construction industry. Given this information, the research expected to find few, if any, instances of organizational learning.

The learning experienced by the respondents was expressed both in terms of actual knowledge gained and of strategies employed. The strategies mentioned are grouped with lessons-learned because they were the end result of an internal learning process and so must be accounted for as the external manifestation of that process. Similar responses were combined and twenty-six unique lessons and strategies were identified during the interviews. The responses are compiled in Table 1. Responses that dealt with a change in behavior or superficial attitude were categorized as single-loop learning. Responses that indicated a shift in the company's underlying paradigm were categorized as double-loop learning. It is important to note that a change in behavior may be prompted by a paradigm change, making that behavioral change a part of double-loop learning. For example, the strategy of investing in new staff and markets at lower cost during the recession was initiated due to the same company's paradigm shift of perceiving the recession as an opportunity rather than a threat. Due to the uncertain nature of attempting to match behavior modifications with paradigm shifts, the decision was made to include only the initial paradigm shift as double-loop learning and categorize any subsequent behavior change as single-loop learning. This provides a clarity and practicality to the measurement of double-loop learning that eludes academic research on the subject, but becomes necessary for a practical application of its precepts.

### *Interviewee Responses*

Responses out of 5	Lesson or Strategy	Single- Loop Learning	Double- Loop Learning	Justification
4	Invest in employee morale & loyalty	X		
3	Diversify before recession	X		
3	Reduce overhead expenses	X		
3	Remain disciplined during recovery	X		
3	Improve subcontractor relations	X		
3	Prequalify and insure subcontractors to protect against default	X		
2	Do not bid no-profit work	X		
2	Bid no-profit work to maintain capacity	X		
2	Invest in estimating	X		
2	Increase field training to improve efficiency	X		
2	Reduce staff through attrition rather than layoffs	X		



*Interviewee Responses, Cont'd.*

2	Implement accountability programs and reports to improve efficiency	X		
2	Increase backlog of work to above capacity at first indication of recession	X		
1	Focus on core business	X		
1	Invest in identifying potential projects early	X		
1	Identify the recession early	X		
1	Educate clients on benefits of delivery systems other than low-bid	X		
1	Alter perception of recession from threat to opportunity		X	Paradigm shift from traditional philosophy about recession
1	Increase efficiency of self-performed work	X		
1	Invest in new staff and markets at lower cost during recession	X		
1	Invest in learning about the recession	X		
1	Cut salaries rather than employees	X		
1	Reduce manpower rather than across-the-board wage reduction	X		
1	Facilitate new projects through reduced/free preconstruction services and banking relation assistance		X	Paradigm shift from traditional philosophy of the role of project creator
1	Reduce debt	X		
1	Do not postpone hard decisions	X		

The information shown in Table 2 compares the companies studied based on information they provided during the interviews. The second and third columns in the table, "Preparation for Future Recessions" and "Profit Margin Comparison" correlate to the answers given by the companies to questions six and seven of the interview, with Likert scale rankings from one (indicating significantly worse preparation or margins) to ten (indicating significantly better preparation or margins). The presence of double-loop learning was determined from an analysis of the information provided by the interviewee. The companies that demonstrated double-loop learning performed comparatively well in both profit margin and preparation for future recessions, but the aspect of growth is the most compelling. Both companies that exhibited double-loop learning mentioned significant company growth during the recession. Because of the small sample size and the purposeful, rather than random, sampling, this information is considered informationally, rather than statistically, significant (Sandelowski 2000). Regardless, the information presented provides significant evidence in support of existing research on the performance enhancing benefits of double-loop learning.

***Company Response Comparison***

<b>Company</b>	<b>Preparation for Future Recessions</b>	<b>Profit Margin Comparison</b>	<b>Double-Loop Learning Present</b>	<b>Growth Mentioned</b>
Company 1	7	4	No	No
Company 2	8	4	No	No
Company 3	8	4	Yes	Yes
Company 4	9	5	Yes	Yes
Company 5	5	2.5	No	No

## Conclusion

The purpose of this pilot study was to identify whether double-loop learning was utilized to enhance the performance of commercial construction companies during the 2008-2009 recession and gauge its effectiveness in this endeavor. The study identified twenty-six individual items that were learned and/or implemented during the recession. The majority of these items were categorized as single-loop learning. This finding is in agreement with existing research that indicates that single-loop learning is the predominant form of learning within the construction industry (Wong et al., 2012). Single-loop learning, though not associated with innovative changes, provided meaningful performance improvement for the interviewed companies. Notable among the single-loop learning items were the importance of maintaining employee morale, the benefits of diversifying industries and geographic locations prior to the recession, and the necessity of improving subcontractor relations. Of great interest were companies' positions on no-profit work and wage versus manpower reduction. The companies that mentioned these items were in disagreement on whether or not engaging in these practices proved beneficial. The reason behind this discrepancy may be linked to organizational structure, business plan, or employee morale. This phenomenon of perceiving similar results from directly conflicting strategies is a potential area for future study. Perhaps having a clearly defined strategy, regardless of its merits, provides some measure of performance improvement.

Of the lessons learned and strategies implemented, only two were identified as double-loop learning. Within the five companies studied, the two companies that demonstrated double-loop learning also exhibited growth during the recession. This is consistent with current organizational learning research that indicates double-loop has a greater impact on performance than single-loop learning (Wong et al., 2012). Though these results are preliminary, relying only upon a small sample size, they support the premise that the rapid and innovative changes inherent in double-loop learning better allow organizations to cope with, and succeed in a rapidly changing economic environment. They provide the groundwork and justification for further research and provide an important introduction to the topic of organizational learning, which is relatively unknown in the industry. Further study is planned with increased sample sizes to better understand and corroborate this phenomenon. Subsequent rounds of sampling will generate greater variation, richer results, and continued analysis.