Kennesaw State University

DigitalCommons@Kennesaw State University

Doctor of Business Administration Dissertations   Coles College of Business

4-21-2015

Supply Chain Managers and Risk Behavior: Testing the Sitkin and Pablo Model

Willie Frank Thompson
Kennesaw State University

Follow this and additional works at: http://digitalcommons.kennesaw.edu/dba_etd

Part of the Marketing Commons, and the Operations and Supply Chain Management Commons

SUPPLY CHAIN MANAGERS AND RISK BEHAVIOR:

TESTING THE SITKIN AND PABLO MODEL

by

Willie Frank Thompson

A Dissertation

Presented in Partial Fulfillment of Requirements for the

Degree of

Doctor of Business Administration

In the

Coles College of Business
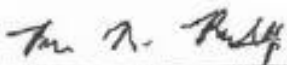
Kennesaw State University

Kennesaw, GA

2015

Coles College of Business
Doctor of Business Administration

Dissertation Defense: April 21, 2015

DBA Candidate: Willie Frank Thompson (Cohort 3, Marketing)

The content and format of the dissertation are appropriate and acceptable for the awarding of the degree of Doctor of Business Administration.
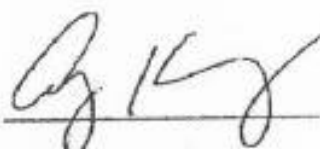
Brian Rutherford, PhD
Committee Co-Chair
Associate Professor of Marketing and Professional Sales
Coles College of Business
Kennesaw State University
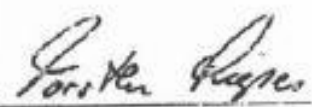
Signature: _____

Chad Autry, PhD
Committee Co-Chair
Taylor Professor of Supply Chain Management
Haslam College of Business
University of Tennessee, Knoxville

Signature: _____

Amy Henley, PhD
Reader
Associate Professor of Management and Entrepreneurship
Coles College of Business
Kennesaw State University

Signature: _____

Torsten Pieper, PhD
Academic Director, KSU DBA Program
Assistant Professor of Management and Entrepreneurship
Coles College of Business
Kennesaw State University

Signature: _____

ACKNOWLEDGMENTS

ABSTRACT

SUPPLY CHAIN MANAGERS AND RISK BEHAVIOR:
TESTING THE SITKIN AND PABLO MODEL
by
Willie Frank Thompson

The frequency of supply chain disruptions is increasing and the resulting costs amplify with the growth of supply chain density and complexity. Supply chain managers serve a pivotal role in ensuring continued firm competitiveness and success. Having the right person whose risk preferences, propensity to take risks, and history dealing with risks match the needs of the company is important. A foundational study performed by Sitkin and Pablo (1992) proposed a conceptual model focused on specific predictors of risk behavior from the individual, organizational, and problem-related perspectives. Questions still remain to the validity of the model given that it has not been fully tested. With the gaps in the current literature, the purpose of this study is to examine (1) does the Sitkin and Pablo (1992) model serve as a valid fit to measure supply chain manager's propensity and perception of risk and (2) how does the managerial disruption perspective affects the risk perceptions/risk behavior relationship? The findings of the study will contribute to theoretical development through the expansion of the managerial disruption perspective on risk perceptions and through addressing the mediating relationship of risk propensity and risk perception on risk behaviors. Empirical testing is performed using a sample of supply chain managers with statistical analysis of the study results.

TABLE OF CONTENTS

LIST OF FIGURES

Figure

LIST OF TABLES

Table

CHAPTER 1

INTRODUCTION

The frequency of supply chain disruptions is increasing and the resulting costs tend to amplify as supply chain density and complexity grow (Altay & Ramirez, 2010). Today's supply chains are designed to be leaner which can have a catastrophic impact on a firm's ability to respond and continue operations if a disruption was to occur (Zsidisin, Ragatz, & Melnyk, 2005). A study of industry executives found the number of companies experiencing supply chain disruptions between 2009 and 2011 grew by 15 percent resulting in increased economic losses of approximately $350 billion (Langley, 2012). Compounding the issue, the Supply Chain Resilience 2013 global survey reported that 75 percent of companies experienced a supply chain disruption within the past year (Business Continuity Institute, 2013). With leaner supply chains and the unpredictability of disruptions, organizations are more vulnerable with only a small margin for error when a disruption takes place (Kleindorfer & Saad, 2005).

The supply chain disruption impact can also reduce a company's competitive advantage, harm a company's reputation, and the company's worth (Sodhi, Son, & Tang, 2012), cutting the share price of impacted companies as much as 10 percent (Hendricks & Singhal, 2003). When a disruption occurs, the extent to which supply chain decision makers are caught off-guard highlights how unprepared the company is for the disruption

(Waters, 2011). Given the financial costs and impact to market share associated with supply chain disruptions, firms are starting to take supply chain disruptions more seriously (Faden, 2014; Hofmann, Busse, Bode, & Henke, 2013; Wagner & Bode, 2008).

Given a typical supply chain's growing vulnerabilities, the management of the supply chain is becoming more important in handling the challenges of increased supply chain risks (Mangan & Christopher, 2005). In managing supply chains, nothing is more essential than having the right person with the right skills in the key position (Slone, Dittman, & Mentzer, 2010). Important for managers designing supply chains is knowledge regarding the characteristics of disruption risks (Wagner & Bode, 2006). Whereas these key employees may vary with regards to risk preferences, propensity to take risks, their history dealing with risks, and their managerial disruption perspective, supply chain managers serve a strategic role in maintaining an organization's competitiveness and success (Mangan & Christopher, 2005). Supply chain managers are being given the majority of the responsibility for risk management to secure the supply chains' reliability and ability to deliver (Norrman & Jansson, 2004).

A classic example involves a fire in an Albuquerque, New Mexico, Philips' semiconductor fabrication plant which destroyed millions of cellphones' worth of chips (Sheffi, 2005). The customers of the plant including Nokia were informed of the problem and the quick response by Nokia's purchasing manager Tapio Markki set in motion actions that secured every available chip from every available source. Through these valiant efforts, Nokia was able to avoid disrupting its customers. The personnel at the damaged plant's other major customer Ericsson did not take the disruption that seriously

and by the time the severity of the problem was realized, it was too late and replacement chips were unavailable. Ericsson ended up with more than $2.34 billion in losses and getting out of the telephone handset production market. Nokia increased its share of the handset market from 27 to 30 percent.

1.2 Research Gaps

While disruption risks' prevalence in the supply chain has been shown through the extant literature (e.g. Autry & Bobbitt, 2008; Rao & Goldsby, 2009; Svensson, 2002) current understanding of the role that supply chain managers serve in addressing or eliminating disruption risks and vulnerabilities is deficient. One potential avenue to help fill this deficiency is a foundational study performed by Sitkin and Pablo (1992) which proposed a conceptual model focused on specific predictors of an individual's risk behavior from the individual, organizational, and problem-related perspectives. A key contribution of their conceptual model is positing mediation. Rather than these three predictor contexts exerting a direct effect on risky behavior, they are posited by Sitkin and Pablo as mediated by risk propensity and risk perception. Specifically, individual factors are mediated by risk propensity and both organizational and problem-related factors are mediated by risk perception (Sitkin & Weingart, 1995). While the Sitkin and Pablo (1992) article is frequently cited in marketing and management literature (e.g., Lumpkin & Dess, 1996; Mayer, Davis, & Schoorman, 1995; McCarter, Mahoney, & Northcraft, 2011; Sitkin & Weingart, 1995; Ulaga & Reinartz, 2011; West & Sargeant, 2004; Zhu et al., 2012), questions still remain pertaining to the validity of the model given that it has not been fully tested. Thus, gaps are left in the current literature.

An additional gap within the literature emerges when considering managers' risk behavior under each of the studied disruption perspectives, something the Sitkin and Pablo (1992) model does not consider. A manager's disruption perspective reflects how an individual's orientation to alignment between self and organization can affect the individual's risk perception (Wasserman, 2006). A manager's disruption perspective can be viewed through two theoretical lenses--agency theory and stewardship theory—which align with their self-determined view of their personal role in the firm's supply chain. Under agency theory agents of the firm have low identification with it and are motivated by extrinsic factors such as income, working conditions, and status (Cadoz-Diez et al, 2005). Alternatively, stewardship theory focuses on long-term utility instead of short-term opportunistic behavior (Hernandez, 2012). Stewards have a close identity with the firm, and are motivated by intrinsic factors such as achievement, personal satisfaction, and recognition (Caldwell et al., 2008; Davis et al., 1997). The two theories are complementary with each more applicable to executives and situations to which the other theory is less applicable (Wasserman, 2006).

1.3 Statement of Purpose

Given the gaps in the current literature, the purpose of this dissertation is to examine (1) does the Sitkin and Pablo (1992) model serve as a valid fit to measure supply chain manager's propensity and perception of risk and (2) how does the managerial disruption perspective affects the risk perceptions/risk behavior relationship?

1.4 Research Contributions

To address the validity of the Sitkin and Pablo (1992) conceptual model, my dissertation will look at supply chain managers' orientation to risky behavior and how it is influenced through risk propensity and risk perception. This research contributes to theory building through addressing the mediating relationship of risk propensity and risk perception on risk behavior. Decisions in the supply chain are not based solely on facts and figures, but also involve less tangible elements such as emotional and attitudinal influences (Cottrill & Rice, 2013). A working knowledge of these factors can improve decision making and help managers to better employ the correct people. Thus, when disruptions occur they can deploy that talent to minimize the negative effects of the disruption (Cottrill & Rice, 2013).

This dissertation contributes to theoretical development through the expansion of the *managerial disruption perspective* on risk perceptions. The moderator *managerial disruption perspective* will be introduced to the model to look at the relationship as a moderator of the risk perception/risk behavior relationship established by Sitkin and Weingart (1995). This approach has been applied to the ethical and social aspects of a manager's actions (Godos-Diez et al., 2011) but not to a supply chain professional's perception toward risk behaviors. Understanding this perspective toward actions provides a better insight of the individual and what to expect from the person when risk situations arise. This knowledge could assist companies in developing incentives that match factors which motivate the person in addressing risky situations. This research could also contribute to the study of supply chain risk and risk reduction through

understanding the factors affecting a supply chain managers' risk propensity and risk perceptions. As shown in the computer chip fire example, a supply chain professional's actions can greatly affect the outcome of a disruption. Given the number of disruptions and billions in associated losses, the stakes are high (Hult, Craighead, & Ketchen, 2010).

The remainder of this paper is organized as follows. Chapter 2 begins with a review of the literature followed by an introduction of the Sitkin and Pablo (2002) model, the role of cumulative prospect theory, construct definitions, and research hypotheses development. Chapter 3 provides a plan for the methodology of data collection, the measures utilized, and the approach for analysis of the result. Chapter 4 will include the results and an explanation of the findings. Chapter 5 will provide discussions, limitations, and suggested directions for future research.

CHAPTER 2

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The aim of the chapter is to provide a theoretical model on which the research is built, present the theory used to support the research, and conceptualization of the research hypotheses. The chapter begins with a review of the Sitkin and Pablo (1992) reconceptualized model of the determinants of risk behavior. After proposing the framework, cumulative prospect theory will be discussed as it relates to this study. Then constructs will be theoretically defined followed by the development of the hypothesized linkages.

2.1 Overview of the Sitkin and Pablo (1992) Model

Using prospect theory, Sitkin and Pablo proposed their model, shown in Figure 1. The model was developed as a means for exposing and reconciling contradictions in risk behavior research. The focus by most scholars on single determinants of risky behavior did not reflect the complexities of real life and has led to potentially inaccurate conclusions about the causes of risk behavior. Risk is inherent in all strategic decisions as "there is some degree of uncertainty associated with decision outcomes, and some outcomes are more desirable" (Pablo, Sitkin, & Jemison, 1996, p. 724). Decisions are characterized as risker "to the extent that (a) their expected outcomes are more uncertain,

(b) decision goals are more difficult to achieve, or (c) the potential outcome set includes some extreme consequences" (Sitkin & Pablo, 1992, p. 11).

Supply chain disruptions are real risks and have been heightened through the removal of buffers offered by safety stock, extended lead times, or excess capacity (Zsidisin, Ragatz, & Melnyk, 2005). Supply disruption risks are defined as "the total potential loss associated with the disruption of supply of a particular purchased item from a particular supplier" (Ellis, Henry, & Shockley, 2010, p.36). Supply chain performance is undermined from risk resonating from various sources within the supply chain (Wagner & Bode, 2008). The magnitude of supply disruptions is defined by the perception of the loss severity that may result from a disruption (Ellis et al., 2010). Zsidisin, Ragatz, and Melnyk (2005, p. 47) stated "the central challenge now facing companies and managers is how to plan for and then respond to devastating disruptions."

According to the Sitkin and Pablo (1992), many of the characteristics that had previously been presented as having direct influence on risk behavior actually influence the risk behavior indirectly via risk propensity and risk perception. The authors also proposed that through this model many of the contradictory findings of past studies are reconcilable in a manner "that clarifies the relative influence of risk propensity and risk perception on risk behavior" (Sitkin & Pablo, 1992, p. 10). They suggest the problem with initial studies did not involve incorrect findings, but ones misinterpreted because the contexts within which they were studied were too limited.

The model includes three clusters of characteristics that influence a decision maker when reacting to risky responses to a problem: individual characteristics,

organizational characteristics, and problem-related characteristics. The individual

characteristics include risk preferences, risk propensity, and risk perception. In further

defining the model, Sitkin and Pablo identified risks preferences as an individual

characteristics related to risk propensity. This dissertation will use the term "factor" as

incorporated in earlier research (e.g., Ellis et al., 2010; Pablo, 1997) to distinguish the

antecedent characteristics. Sitkin and Pablo added to the model two other individual

factors, inertia and outcome history. The corporate factors of the model include

leadership influence, social influence, and organization control systems. Problem-related

factors in the model include problem domain familiarity and problem framing. The

model is shown below in Figure 1.

Figure 1. Sitkin and Pablo (1992) Model of Determinants of Risky Decision-Making
Behavior
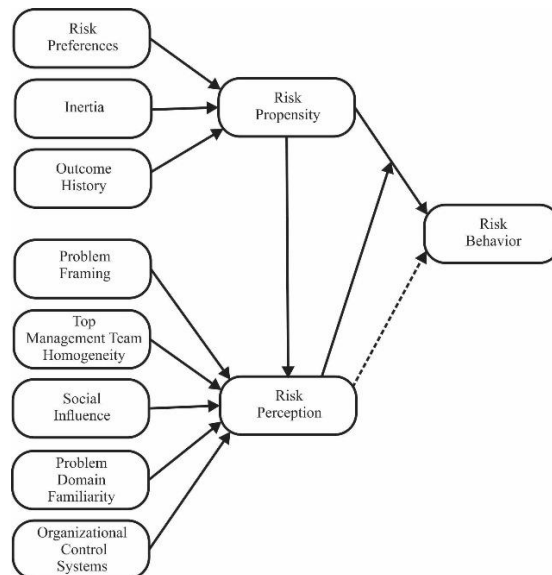
Note: Dashed line between Risk Perception and Risk Behavior
indicates past research suggested the relations, but Sitkin and Pablo
found it appears to be fallacious (Sitkin & Pablo, 1992).

2.2 Cumulative Prospect Theory

In developing their model Sitkin and Pablo (1992) noted that previous decision-making behavior studies focused on single determinants of risk behavior that Sitkin and Pablo stated did not reflect the true complexities of real life. One theory they mentioned was the influential prospect theory (Kahneman & Tversky, 1979; Sitkin & Pablo (1992). Prospect theory was originally presented as an alternative to address a shortcoming of expected utility theory, the long-time dominant model of individual decision making under uncertainty (Kahneman & Tversky, 1979). Prior research suggests that actual behavior involving individual choice is often different from behavior predicted by expected utility theory (Ellis et al., 2010; Fischhoff, 1992; Kahneman & Tversky, 1979). Prospect theory assumed that "the carriers of values are changes in wealth or welfare, rather than to the final state" (Kahneman & Tversky, 1979, p. 277). Prospect theory proposed that an individual's risk behavior is determined in how a situation is framed (Sitkin & Pablo, 1992). According to the theory, perception is adjusted to a person's evaluation of changes and differences rather than to the evaluation of absolute magnitudes. When a person responds to a situation, a person's perception or reference point is developed by past experiences and the present context of the situation (Kahneman & Tversky, 1979). This reference point and the way choice problems are coded and edited during the decision analysis. The outcomes are then coded as gains or losses based upon the person's reference point. The theory proposes the losses will appear greater than the gains (Kahneman & Tversky, 1979).

In prospect theory, value is defined as deviations from the reference point (Kahneman & Tversky, 1979). The theory incorporates decision weights that are multiplied with the outcome value. "Decision weights measure the impact of events on the desirability of prospects, and not merely the perceived likelihood of these events" (Kahneman & Tversky, 1979, p.280). They are inferred from choices between prospects much as subjective probability is inferred from preferences (Kahneman & Tversky, 1979). As prospect theory is proposed as a model of choices, therefore it is theorized that the measurement of values and decision weights should be based on specific prospects (Kahneman & Tversky, 1979).

Prospect theory was not without its problems. In their seminal article, Sitkin and Pablo (1992) pointed out three studies with results contradictory to prospect theory. Two studies, focusing on an individual's previous risk-taking and its outcomes to predict the individual's future behavior toward risk in the future, found a willingness to take a risk to protect prior gains where prospect theory predicted a risk adverse behavior (Osborn & Jackson, 1988; Thaler & Johnson, 1990). Another study found individuals become risk adverse when threatened with likely losses, a reaction opposite than prospect theory predicts (Staw, Sandelands, & Dutton, 1981).

That same year prospect theory was extended by Tversky and Kahneman (1992) to include uncertainty as well to risk prospects with any number of outcomes. The resulting theory was named cumulative prospect theory. The theory resulted in different evaluations of gains and losses, not identified in the original prospect theory and "provides a unified treatment of both risk and uncertainty" (Tversky & Kahneman, 1992,

p. 298). Cumulative prospect theory adds a weighting function to transform probability distributions to accommodate some violations of expected utility theory (Neilson & Stowe, 2002). The revised theory assumes losses carry more weight than gains (Nilsson, Rieskamp & Wagenmakers, 2011).

In revising prospect theory into cumulative prospect theory, the theory further supports that the phenomena of choice includes risk seeking and loss aversion. While problems with prospect theory were identified by Sitkin and Pablo (1992), the revised theory will better serve in the testing of the Sitkin and Pablo model in this dissertation. "This development extends prospect theory to uncertain prospects, as well as to risky prospects, with any number of outcomes while preserving most of its essential features" (Tversky & Kahneman, 1992, p. 300).

2.3 Defining the Relevant Constructs from Sitkin and Pablo (1992) Model

Table 1 presents the definitions of the constructs used in this study. This includes the constructs considered relevant from the Sitkin and Pablo (1992) model. Further, additional relevant constructs from subsequent literature which are examined within the study are defined within this table.

2.3.1 Risk behavior. *Risk behavior* is defined as taking or avoiding actions that may cause outcomes varying significantly and resulting in gains or losses (Das & Teng, 1997; Wagner & Bode, 2008). Wagner and Bode (2008), addressing supply chain business realities, chose the view that risk behavior should not be a gamble but behavior that equates with a level of damage and loss resulting from a supply chain disruption. To

consider a behavior as risky, the person involved must believe the more numerous the

potential for losses, the greater the behavior risk (Yates, 1992).

"Actions that mitigate one risk can end up exacerbating another" (Chopra &

Sodhi, 2004, p.54). While companies move to become leaner, they expect the

vulnerability of their supply chain to increase (Juttner, 2005). For example, reducing

buffers and redundancies lessens a supply chain's ability to absorb disruptions that occur

within the supply chain (Stecke & Kumar, 2009). Dependence on a single supplier can

substantially increase supply chain disruptions risks (Stecke & Kumar, 2009).

Paradoxically, the more efficient supply chains are creating newer risk sources and

thereby adding vulnerability (Giunipero & Eltantawy, 2004).

2.3.2 Risk propensity. *Risk propensity* is defined as an individual's *current*

tendency either to choose more or less risky alternatives (Sitkin & Weingart, 1995). The

current tendency aspect of risk propensity has been debated within the current literature.

MacCrimmon and Wehrung (1984) found that some people are consistent in risk taking

measures and could be considered as consistent risk seekers or consistent risk averters.

Other research has found risk propensity inconsistent across different situations and

dependent on the chance of potential gains or losses (Bromiley & Curley, 1992;

Highhouse & Yuce, 1966). A person's attitude toward risk may differ across different

risk situations and different times (Nicholson et al., 2005; Weber, 2010). With risk

propensity there is the willingness of the decision maker to make a choice at an

acceptable level of risk (Conchar et al., 2004).

Table 1. Definitions of Constructs

Construct	Definition	Context	Source
Risk Behavior	Taking or avoiding actions that may cause outcomes varying significantly and resulting in gains or losses	Entrepreneurs; 760 German business executives	Das & Teng, 1997; Wagner & Bode, 2008
Risk propensity	An individual's *current* tendency to either choose more or less risky alternatives	38 MBA students and 63 undergraduate students	Sitkin & Weingart, 1995
Risk perception	Decision maker's assessment of the consequences of the alternatives and their probabilities of occurrence inherent in a situation	Model development	Baird & Thomas, 1985; and Sitkin & Pablo, 1992
Risk preferences	Decision maker's stable partiality or disdain for risk (i.e., attitude) fostered by the individual's personal beliefs or experiences about risk	Book; entrepreneurs	Douglas & Wildavsky, 1983; Brockhaus, 1980
Outcome History	Degree to which the decision maker believes decisions based upon previous experiences have resulted in successful or unsuccessful conclusions	Senior managers in purchasing from broad range of manufacturing sectors and firm sizes. 38 MBA students and 63 undergraduate students	Bode et al., 2011; Sitkin & Weingart, 1995
Problem domain familiarity	"The confidence level that results from increased levels of past experiences with supply chain disruption risks"	Model development	Sitkin & Pablo, 1992, p. 22
Organizational control system – process	A firm that advocates following preset decision-making procedures	Managers of sales firms	Oliver & Anderson, 1994
Organizational control system – outcome	A firm that emphasizes the end results rather than the steps used to reach the end results	Managers of sales firms	Oliver & Anderson, 1994
Leadership influence	The perception of support from organization management to take steps to reduce risks	Senior managers in purchasing from a broad range of manufacturing industry sectors and firm size (Bode et al., 2011). Meta-analysis (Rivis & Sheeran, 2003)	Bode et al., 2011; Rivis & Sheeran, 2003
Managerial disruption perspective	The inclination to behave for individual benefit versus to behave in the best interest of the organization and all stakeholders	149 CEOs in Spain	Godos-Diez et al, 2011

2.3.3 Risk perception. *Risk perception* is defined as a decision maker's assessment of the consequences of alternatives and their probabilities of occurrence inherent in a situation (Baird & Thomas, 1985; Dowling, 1986; Sitkin & Pablo, 1992). Risk perception is influenced by the degree of situational uncertainty, the controllability of the uncertainty, and confidence in those assessments (Baird & Thomas, 1985). Risk perception is "an important explanatory variable because it can help to explain variation in individual risk behavior within the bounds generally defined by risk propensity" (Sitkin & Pablo, 1992, p. 29).

2.3.4 Individual factors

2.3.4.1 Risk preferences. *Risk preferences are* defined as a decision maker's stable partiality or disdain for risk (i.e., attitude) fostered by the individual's personal beliefs or experiences about risk (Brockhaus, 1980; Douglas & Wildavsky, 1983). Decision makers have tendencies attracting them to or moving them from alternatives perceived with higher risk. The subjective nature of risk preference arises in what is considered a loss, its significance, and its chance of occurring are peculiar to the person concerned (Brachinger & Weber, 1997).

As most real-world decisions involve the decision maker being called upon to make choices rather than to state a certainty equivalent, risk preference is revealed through a person's actions (Hsee & Weber, 1999). Attitudes toward risk can quantify "the degree to which a person finds perceived risk attractive (or unattractive) and therefore the person will choose alternatives that carry greater (or less) risk, all other things being equal" (Weber, 2010, p. 84).

2.3.4.2 Outcome history. *Outcome history* is defined as the degree to which the decision maker believes decisions based upon previous experiences have resulted in successful or unsuccessful conclusions (Bode, et al, 2011; Sitkin & Weingart, 1995). Outcome history is the evidence upon which a person assesses chances for future success (Taylor, et al., 1996). Through the outcome history an individual's level of confidence is built in using the full range of available responses, because there is a better understanding of the response-outcome relationship (Daft & Weick, 1984; Fiol & Lyles, 1985). The feeling of riskiness of choice options lowers through familiarity with the risky choice options or with the risky choice domain (Weber, 2010).

2.3.5 Problem-related factors

2.3.5.1 Problem domain familiarity. *Problem domain familiarity* is defined as "the confidence level that results from increased levels of past experience in supply chain disruption risks" (Sitkin & Pablo, 1992, p. 22). Problem domain familiarity is declared as a key factor contributing to risk perception (Dimov & Shepherd, 2005). With familiarity comes less perceived risk (Sitkin & Pablo, 1992). Factors for assessing perceptions of risk, return, opportunities, and threats are relevant knowledge and understanding (Dimov & Shepherd, 2005).

Decisions by the supply chain manager must be weighted not only on how it affects one aspect of the supply chain, but by the impact on the supply chain's full performance (Sloan, Dittmann, & Mentzer, 2010). Factors for assessing perceptions of risk, return, opportunities, and threats are relevant knowledge and understanding (Dimov

& Shepherd, 2005). People develop a more realistic perception when they have either direct or indirect experience (Sjoberg, 2000).

2.3.6 Organizational factors. Two reward systems related to risk were conceptualized by Sitkin and Pablo (1992) drawing upon Ouchi (1977). The first is based upon an appropriate decision-making process (process control) and the second bases rewards on the results of the actions taken (outcome control). Outcome and behavior controls are considered as polar opposites and by treating them as separate constructs research findings should reflect how management may elect to position strategy at various levels between the extremes (Oliver & Anderson, 1994).

While Sitkin and Pablo (1992) treat organizational control system as one variable this dissertation follows previous research which expanded this variable into two parts—organizational control system process and organizational control system outcome (Ouchi, 1977). Few organizations are likely to operate a control system that is completely based upon processes or completely based upon outcome (Cravens, et al., 1993). Agency theory suggests behavior based and outcome based strategies of control (Eisenhart, 1985). This dissertation separates the two systems into separate constructs of *organizational control system process* and *organizational control system outcome*.

2.3.6.1 Organizational control system – process. *Organizational control system - process* is defined as a firm that advocates following preset decision-making procedures (Ouchi, 1977). With such a process the thought follows that a decision may involve risk but it is for the organization and not to the individual (Ouchi, 1977). In an organization there are only two phenomena—behavior and the outputs resulting from behavior—

which can be observed, monitored, and counted (Ouchi, 1977). In a given situation, the organizational control systems can "foster perceptions of either high or low risk because what they reward and punish focuses attention on different aspects of the decision-making process" (Sitkin & Pablo, 1992, p. 24).

2.3.6.2 Organizational control system – outcome. The second organizational control system focuses on the ultimate output. O*rganizational control system - outcome* is defined as when a firm emphasizes the end results rather than the steps used to reach the end results (Ouchi, 1977). Outcome based controls, more of a laissez-faire approach, assume employees having the knowledge, skills, and ability to determine their direction and the effort level needed to achieve the firm's goals (Coff, 2002; Oliver & Anderson, 1994). When behaviors are difficult for managers to observe, outcome based controls can be used to motivate (Eisenhardt, 1985). This form of control decentralizes control while providing the incentives and responsibilities for results that benefit the firm (Snell, 1992). One deterrent of this system lies in the lack of a mechanism to prevent mistakes before they occur. Since the employee bears more risk under this control system, the individual may likely be likely risk-averse (Snell, 1992).

2.4 Defining Additional Constructs Within the Proposed Model

This dissertation has the potential to add to the model's predictability with two new constructs not included in the original Sitkin and Pablo (1992) model: *leadership influence* and *managerial disruption perspective*. The focus of corporate factors in this study is on three factors directly influencing the risk perception of the individual decision maker. Along with the organizational control systems, leadership influence is another

with which the individual deals. Leadership influence was identified by Sitkin & Pablo

(1992) as the most often cited source of influence by decision makers developing

perceptions of risk.

Once an individual's risk perception is formed a factor not considered by Sitkin

and Pablo is how the individual approaches the risk behavior. No behavior is more

important to supply chain excellence than all functions pulling together in unison (Slone

et al., 2010). If the supply chain manager, who is becoming more important, with

overseeing this goal of unison is more concerned with self-preservation than company

performance the result could be less than unison which results in lost profit (Sloan et al,

2010). It is with consideration that the perspective of the supply chain manager toward

disruption is considered an important variable to add in the study of this model. By

introducing *Managerial disruption perspective* to the model whether the risk will be

handled with the focus being on the individual's benefit or more on the benefit to the

organization will be addressed as it moderates the relationship of risk perception and risk

behavior.

2.4.1 Leadership Influence. *Leadership influence* is defined as the individual's

perception of support from organization management to take steps to reduce risks (Bode

et al., 2011; Rivis & Sheeran, 2003). When it comes to risk taking, the more

conservative or risk adverse the firm, less is the desire for taking risks (Kliem & Irwin,

1997). This type firm tends to "value compliance and stability, reward conformity, and

use more structured and mechanistic planning and budgeting systems" (Pablo & Javidan,

2002, p.210). Less conservative firms tend to take more risks, "have propensity toward

valuing individual freedom and initiative, hire more individualistic and aggressive employees, focus on individual and team performance, and encourage less bureaucratic planning and budgeting systems" (Pablo & Javidan, 2002, p. 210).

When it comes to addressing risk, successful risk management includes a match in approaches taken between management and the employee (Mentzer et al., 2001). As stated earlier, Sitkin and Pablo (1992) point out that the leadership influence is the most cited source of influence is a decision maker's perceptions of risk. When there is difference in the approaches on how to handle risks, there will be conflict and the result will be less successful (Pablo & Javidan, 2002).

2.4.2 Managerial disruption perspective. The construct *managerial disruption perspective* is defined as the inclination to behave for individual behavior versus behaving in the best interest of the organization and all stakeholders (Godos-Diez et al., 2011). Managers have been observed as having different characteristics and being motivated through different attributes (e.g. Hambrick & Mason, 1984; Mitchell, 1982). Some managers will serve their own interests at the expense of the principal, while others will choose to serve the interests of the principals (Martynov, 2009).

Martynov's findings basically stated the fundamental difference in agency theory and stewardship theory. According to agency theory, an agent's behavior is more opportunistically and personal welfare is the agent's main concern (Davis, Schoorman, & Donaldson, 1997). In respect of agency theory, an agent is defined as a person engaged by the principal to perform a task on the principal's behalf while granting the agent a level of authority to make decisions (Jensen & Meckling, 1976). Agents may be so

interested in increasing personal material wealth that they will do so at the expense of the principal (Martynov, 2009). The agent's self-serving behavior is kept in check and costs incurred through imposing internal controls (Davis, Schoorman, & Donaldson, 1997).

Stewards represent the other side of this "managerial" coin. Stewardship theory finds that stewards behave in ways that place the organization and all the stakeholders above individual benefits or interests (Davis, Schoorman, & Donaldson, 1997). Steward managers will likely choose to serve the interest of the principal or firm even when it involves the manager suffering a material loss (Martynov, 2009). Their motives are not for individual benefit, but more for the benefit of the organizations or "principals" (Davis, Schoorman, & Donaldson, 1997).

2.5 The Reduced Sitkin and Pablo Model as Modified for This Study

Figure 2 presents the reduced model as modified for this study. This includes the constructs considered relevant from the original Sitkin and Pablo (1992) model. It also includes the new constructs of leadership influence and managerial disruption perspective.

2.6 Constructs from Sitkin and Pablo (1992) Model Deemed Not Relevant To This Study and Therefore Not Included in This Study

Four constructs from the Sitkin and Pablo (1992) model are not included in this study as they were found not relevant to the current study. These constructs are inertia, problem framing, top management team homogeneity, and social influences. A brief definition or each construct and the reasoning for not including it in this study follows.

Figure 2. Reduced Sitkin and Pablo Model as Modified for this Study
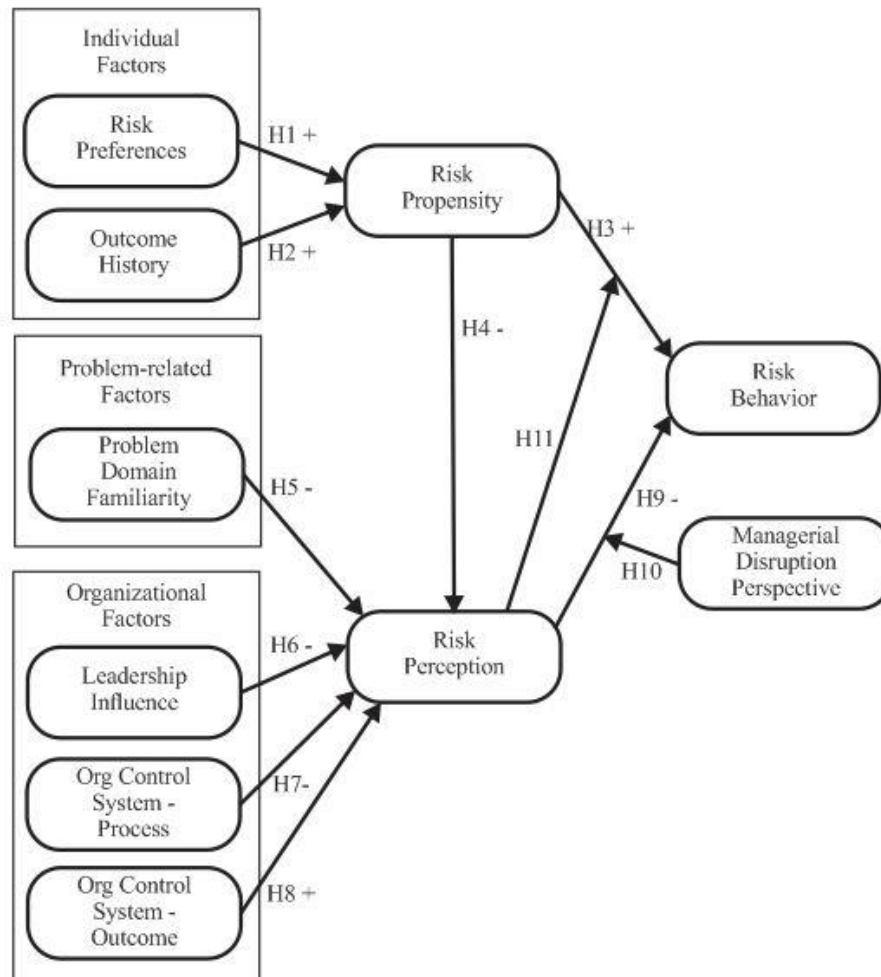
Inertia is defined as habits or routine approaches an individual develops toward

handling risky situations (Pablo, 1997). Inertia leads more risk adverse decision makers

to continue being more cautious and risk seeking decision makers to continue being more

adventurous (Sitkin & Pablo, 1992). This dissertation focuses more on the current status

of risk propensity in dealing with different risk behaviors and inertia is found to decline

as consistency declines (Ajzen, 2002; Slovic, 1972).

Problem framing is defined as presenting the acts, outcomes, and contingencies associated with a particular choice in either positive or negative terms (Tversky & Kahneman, 1979). How a situation is framed can have a bearing on the relevance of the decision made (Starmer, 2000). In business, risk as a purely negative construct corresponds best to reality and is equated with the harm or loss realized through a supply chain disruption (Wagner & Bode, 2006). Following the thinking that the reality of supply chain risk is a negative outcome, problem framing is deemed outside the scope of this study.

Top management team homogeneity is defined as when members of management place mutual support and consensus above rational debate, reasonable conflict, and decision quality (Sitkin & Pablo, 1992). The result could be inadequate collection and processing of conflicting and diverse information (Sitkin & Pablo, 1992). This dissertation focuses more on the relationship between the supply chain manager and his individual leader in the organization to whom he or she answers. This factor is therefore deemed outside the scope of this study.

Social influences are defined as information processing where organizations and organizational members come to influence ultimately the actions of an individual (Sitkin & Pablo, 1992). The danger with social influences is that organizational culture becomes the basis on which members view the world, which can in turn distort an individual's perception on the situational risk (Sitkin & Pablo, 1992). The most often social source of a decision maker's risk perception is the leadership who makes the critical judgments (Sitkin & Pablo, 1992). As this dissertation focuses on the leadership influence aspect of

social influence which is being captured in the construct *leadership influence*, the

inclusion of overall social influences is therefore outside the scope of this study.

2.7 Research Hypotheses Development

2.7.1. Individual Factors

2.7.1.1 Risk preferences. Preferences can be influenced by attitude (Katz, 2002).

Attitudes follow directly from behavior which may be based on past experiences,

influenced by second-hand information from friends and acquaintances, and by the

perceived difficulty to perform the behavior (Ajzen, 1991). People whose attitude

identifies positively with a certain trait are more likely to perform a behavior consistent

with that trait (Fishbein & Ajzen, 2010). This would conclude that decision makers with

a stronger preference to avoid failure will tend exhibit a low propensity to risk

(Brockhaus, 1980).

Not everyone agrees. There have been differing findings on risk preference as a

factor in defining risk propensity. One study involving the risk propensity of oil

executives found lack of support for the idea that an individual's preferences determine

risk propensity (Pablo, 1997). The study suggested that having preferences toward risk

does not in itself determine an individual's level of risk propensity (Pablo, 1997).

However, a later study by Barbosa, Gerhart, and Kickul (2007) found support for the

influence of risk preferences. Weber (2010) and Guthrie (2003) also found that risk

preferences reflect how a person likes or fears risk. Those with a higher risk preference

like the upward potential and the anxiety risk provides while those who have a lower risk

preference fear the downward or loss potential and the anxiety risk provides (Weber,

2010). Those with higher risk preference tend to take risk when there are possible gains, but tend to have a lower risk preference when there are possible losses (Guthrie, 2002). While there have been different results in studies on risk preferences, based on the findings from these later studies, the following is hypothesized:

> *H1. An individual's risk preferences are positively associated with the*
> *individual's risk propensity.*

2.7.1.2 Outcome History. The results of past exposure with current circumstances may affect the individual's level of risk propensity. Past behavior has been found to serve as a strong predictor of future behavior (van der Pligt, 1998).   For example, having actions result in positive results could lead the individual to take the same actions the next time the situation arises. A person may even consider the experiences they have strong enough to believe they control the factors that determine their actions and outcomes (Li & Tang, 2010). Negative results can result in an individual not being familiar with how best to interpret the risk when faced with the event again or just the opposite in the belief of control (Bode, et al., 2011; Li & Tang, 2010). This conflict can lead to difficulties in determining adequate responses. If circumstances have not changed, when faced with similar circumstances future behavior will strongly reflect previous behavior (Ajzen, 2002).

Previous research has found support for outcome history's influence on risk propensity (Sitkin & Weingart, 1995). Experience leads a person to revise their existing knowledge and assumptions thereby affecting future decisions and actions (Shepherd, 2003). "To the extent that decision makers can associate their outcomes with their

actions, successful risk-averse decision makers will become increasingly risk averse, and successful risk-seeking decision makers will become increasingly risk seeking" (Sitkin & Pablo, 1992, p. 17). Therefore, having a high level of past results either, positive or negative, should amplify the relationship between outcome history and risk propensity (Bode, et al., 2011). This is further supported by Thaler and Johnson (1990) who found that decision makers continue in taking risks if previous risk-related actions were successful. Consistent with the findings of this research, the following is suggested:

H2. *An individual's outcome history is positively associated with the individual's risk propensity.*

2.7.1.3 Linking risk propensity to risk behavior. At the core of the Sitkin and Pablo (1992) model is the idea that "an individual's propensity to take or avoid risks affects decision making" (Sitkin & Weingart, 1995, p. 1578). Research has shown a significant correlation in the relationship between risk propensity and risk behavior. Past research has studied propensity in situations of loss and gains, as psychological factors, and as personal characteristics (Hollenbeck et al., 1994; Kahneman & Tversky, 1979; Nicholson et al, 2005). Conclusions have been drawn that some people are excited by risk and define risk as a pleasure for consuming (Nicholson et al, 2005). More risk adverse decision makers are likely to focus on the negative outcomes, will overestimate the probability of loss, and desire to avoid risky situations (Schneider & Lopes, 1986).

After identifying the potential of supply chain disruptions one factor affecting the supply chain manager's feeling toward taking action is his/her personal risk propensity (Nicholson et al., 2005). Brockhaus (1980) found those with a low risk propensity tended

to avoid behavior with higher risk while preferring safer undertakings. He also found that while there are individuals with high risk propensity and low risk propensity, there are also individuals with a moderate degree of risk propensity who are more prone to moderate levels of risk (Brockhaus, 1980). This previous research leads to the following hypothesis:

H3. An individual's risk propensity is positively associated with the individual's risk behavior.

Risk propensity was a risk characteristic that had been overlooked in risk research (Sitkin & Pablo, 1992). Its importance has been recognized in research and has been found to impact the perception of the risk level involved with decision making (Cho & Lee, 2006; Forlani et al., 2002). Cho and Lee (2006) went so far as to label it a key determinant of perceived risk.

The importance of incorporating risk propensity is recognized in understanding perceived risk (Cho & Lee, 2006). As the level of perceived risk determines the motivation an individual to engage in behavior, risk propensity's impact on risk perception can affect the possible likelihood of an individual's risk behavior (Dowling & Staelin, 1994). Research supports the idea that the higher an individual's risk propensity, the lower will be the individual's level of perceived situational risk (Keil et al., 2000; Sitkin & Weingart, 1995). A risk-adverse decision maker exhibiting his lower risk propensity focuses on the possible negative outcomes with the result of a heightened perception of risk (Keil et al, 2000). Consistent with current research this leads to the following:

H4. An individual's risk propensity is negatively associated with the individual's

level of risk perception.

2.7.2 Problem-related Factors

2.7.2.1 Problem domain familiarity. Problem domain familiarity represents how much experience a person has with a situation he/she encounters (Cowan, 1986, p. 769). Experience is the purest form of learning (Levitt & March, 1988). From experience comes a likely focus by decision makers on personal abilities and previous successes instead of a current situation's characteristics (Sitkin & Pablo, 1992). However, with experience can come risk denial which has been expressed as a very important feature of risk perception (Sjoberg, 2000). Experience is not always all good or all bad. It is not always clear as to what happened is a success or a failure. But this does not stop people from interpreting the events and classifying outcomes as either good or bad (Levitt & March, 1988; Thompson, 1967).

Experience provides motivation and defines the conditions under which a company will take action (Bode, Wagner, Petersen, & Ellram, 2011). "Familiarity with risky choice options or a risky choice domain lowers the feeling of riskiness of choice options" (Weber, 2010, p.83). Without the familiarity brought from prior experience, a firm or individual has difficulty in determining proper responses (Bode et al., 2011). Ellis, Shockley, and Henry (2011) referenced enactment theory to suggest diversity and the number of an individual's experiences facilitate sense-making when successfully coping with supply chain disruptions. The previous research agrees to the importance increased levels of past history and knowledge, or problem domain familiarity, plays in

an individual's risk perception (Sitkin & Pablo, 1992). The level of problem domain familiarity can affect risk perceptions. With this familiarity can come overconfidence in making judgments resulting in a lower risk perception. It is not stable. Individuals with less familiarity when provided with additional experience can lead to shifts in risk perceptions (Sitkin & Pablo, 1992). Building on the previous research, the following hypothesis is proposed:

> H5. *An individual's level of problem domain familiarity is negatively associated to the individual's risk perception.*

2.7.3 Organizational Factors

2.7.3.1 Leadership influence. Successful implementation of supply chain management takes the involvement of top management, the organization's leaders (Sandberg, 2007). As an organization's top management grows in awareness and concern about supply chain disruptions, more importance is attached to the issue of reducing the disruption risks (Bode et al., 2011). Supply chain managers depend upon their management to give direction regarding supply chain risks. The most effective organizational leaders are those who lead others to think in innovative ways and to drive change (Basadur, 2004). Empowerment of employees to take risk through the organization's leadership influence promotes change from the employees (Farrell, 2000).

Organization leaders should be aware of risks to their organization as risks effect more than the single element in an organization; it can affect the organization's supply chain as a whole (Jereb et. al, 2012). Leadership is about coping with change and through encouraging, or influencing, employees to take risk organizations can develop

the ability to deal with the ever changing world (Kotter, 2001). Supply chain managers perceive the level of support from the organization's leadership, as to whether risk behaviors should be performed or not performed (Bogers et al., 2004). With stronger leadership influence support comes a lower level of risk perception and with lower leadership influence support comes a higher level of risk perception. Building on previous research the following hypothesis is proposed:

H6. Leadership influence is negatively associated with the individual's risk perception.

2.7.3.2 Organizational control system – process. Organizational control system-process has "greater management involvement (i.e., supervision, contact, and direction), more subjective evaluation methods based on process behaviors rather than outcome results, and a greater proportion of salary in the pay package" (Oliver & Anderson, 1994, p. 58). Affective processes are implicated in risk-taking, possibly through individual differences and may influence an individual's affective response toward risk (Weber, Blais, & Betz, 2002). Individuals with a risk-averse nature are thought better suited for this approach and the prototypical person in this system is committed, satisfied, and a team player (Oliver & Anderson, 1994).

From this can be argued two points. First, control systems that reward the decision making process "will tend to imbue decision-making procedures with an aura of legitimacy and infallibility" (Sitkin & Pablo, 1992, p. 24). Second, individuals in an organization where the emphasis is on processes will perceive lower personal risks (Sitkin & Pablo, 1992). Success under process controls results from employees who are

professionally competent and team-oriented with risk aversion (Cravens, et al., 1993).

Building on previous research the following hypothesis is proposed:

> *H7. An organizational control system based on process is negatively associated*
> *with an individual's risk perception.*

.3.3 Organizational control system – outcome. The second organization control system is based on outcome. Individuals bear increasing risk as organizational control systems becomes more outcome based (Eisenhardt, 1985). With little day-to-day contact and support from managers, employees under this system may become more self-oriented and less employer oriented (Oliver & Anderson, 1994). Persons preferring this system are believed motivated by immediate self-interest and more risk-prone (Oliver & Anderson, 1994).

This system can also lead to employees who are less-satisfied and have less commitment to their employers (Oliver & Anderson, 1994). With outcome-oriented control systems the outcome measures are more directly attributable to the individual (Cravens et al., 1993). These systems are hypothesized to result in the individual responsible for the decision perceiving a higher risk as both the associated rewards and punishments will tend to be higher (Sitkin & Pablo, 1992). As organizational control systems become more outcome based, the individual can have a higher risk perception. Building on previous research the following hypothesis is proposed:

> *H8. An organization control system based on outcome is positively associated*
> *with an individual's risk perception.*

2.7.3.4 Linking risk perceptions to risk behavior. The traditional view has been that risk perceptions precede risk behavior (Ellis, Shockley, & Henry, 2011). Risk involves an interaction between the behavior and the risk taker (Yates & Stone, 1992). A person's risk perception culminates through combining the loss 2.7possibility, loss significance, and loss uncertainty (Yates & Stone, 1992). Sitkin and Pablo (1992) while finding past research suggested the relationship between risk perception and risk behavior, they found this relationship could be spurious.

The relationship between risk perception and risk behavior has been suggested by research as stronger than stated by Sitkin and Pablo (1992). Sitkin and Weingart (1995) found the relationship between risk perception and risk behavior significantly negatively related. Past research had found that as perceived risk levels increase, a person will have desire to engage in the riskier behavior (March & Shapira, 1987). Risk perception has been found to influence decision choice patterns (Mitchell, 1995). Risk perception has also been called the fundamental driver of risk behavior (Ellis et al., 2010). As people tend to associate risk with negative behavioral outcomes, it seems reasonable to hypothesize that higher levels of perceived risk would be negatively related to how risky decisions are made (Sitkin & Weingart, 1995). These research findings lead to the following:

H9. An individual's risk perception is negatively associated with the individual's undertaking of risk behavior.

2.7.4 Moderators

2.7.4.1 Managerial disruption perspective as moderator to the risk perception – risk behavior relationship. How an individual will behave when faced with risk is a factor that may be moderated by the approach an individual takes. Agency theory and stewardship theory are complementary theories that provide two different perspectives. According to agency theory individuals are concerned with themselves and base action on self-interest more than the organization-interest (Eisenhardt, 1989). In a higher risk situation the agent-oriented individual would avoid taking action or not put forth the effort that could directly affect personal financial outcome or utility (Eisenhardt, 1989). A steward-oriented individual would do whatever is best for the organization without concern about personal utility (Davis, Schoorman, & Donaldson, 1997).

Individuals choose to have a managerial disruption perspective that is oriented to either more steward or more agent (Davis, Schoorman, & Donaldson, 1997). When faced with a perceived high level of risky behavior, the self-interest focused individual (agent) has little concern about long-term success and the direction the action takes unless properly motivated leading to a lower risk adversity (Arthurs & Busenitz, 2003). When faced with a risky behavior, the more steward-minded individual will show concern. Therefore, when an individual whose self-interest is high perceives risk as high, the more risk adverse and self-protective the individual will be. When an individual whose concern is more toward the organization's benefits perceives a high risk, the person's actions toward the risk behavior will be oriented toward what is best for the long-term success of the company. This leads to the following hypothesis:

H10. An individual's managerial disruption perspective has a moderating association with the relationship between risk perception and risk behavior.

2.7.4.2 Risk perception as moderator to risk propensity-risk behavior relationship. Perceived risk is one of the prices of choice and forms an important part of overall decision making (Conchar, Zinkhan, Peters, & Olavarrieta, 2004). To what extent an individual finds a risk appealing is quantified by risk perception (Weber, 2010). When risk propensity is considered not only as a personality trait but as a behavioral tendency, risk propensity can be affected by a person's risk perception (Keil et al., 2000; MacCrimmon & Wehrung, 1984).

A decision maker's assessment of the situation's risk can affect the decision toward actions thereby affecting the risk propensity (Conchar et al., 2004). The main relationship of risk propensity on risk behavior might well be strengthened as the level of perceived risk rises because it "can help explain variation in individual risk behavior within the bounds generally defined by risk propensity" (Sitkin & Pablo, 1992, p. 29). Sitkin and Pablo (1992, p. 29) gave as an example, "individuals with a propensity to avoid risks are likely to exhibit increasingly risk-averse behavior as perceived situational risk rises. Conversely, individuals who are prone to seek risks might be expected to exhibit riskier behavior as their perceptions of situational risk rise." To test this relationship, the following is hypothesized:

H11: An individual's risk perception has a moderating association with the relationship between risk propensity and risk behavior.

CHAPTER 3 - METHODS

Chapter 3 outlines the research procedures incorporated in this dissertation to test

the hypotheses. This chapter starts with a description of the survey items and scales

chosen to serve as measures are presented.   Next, the chapter presents a description and

reasoning for its analytic procedures. These are followed by a description of the

pretesting procedures which led to the final questionnaire. A description of survey

participants and the collection methods are then presented.

3.1 Measures

The measures of this study focus on individual characteristics of risk propensity.

Risk perception serves as a mediator between the organizational factors and risk

behavior. To measure these focal areas, items for each construct were adopted where

possible otherwise adapted to meet the context of supply chain managers. Measures for

each construct are presented in detail. Researchers as late as 2008 found a lack of formal

scales designed for supply chain management research (Wagner & Bode, 2008). Much

of the earlier research was based on anecdotal evidence or case studies (Wagner & Bode,

2008). This dissertation benefits from the research by Wagner and Bode (2008), but also

incorporates several established scales from other disciplines that have been used to

measure behavior including Sitkin and Weingart (1995), Svennson (2002), and Ajzen and

Driver (1991).

The questionnaire for this study was drafted from existing scales. To refine the questionnaire, comments regarding item relevance, question wording, directions wording, and the overall questionnaire format were solicited from a small number of practitioners and academicians. The questionnaire was further refined through comments from a small number of supply chain executives. A pretest of the questionnaire was conducted with a small number of supply chain management executives to determine the questionnaire's adequacy for the larger study.

3.1.1 Risk behavior. To measure the construct *risk behavior* items from the risk management scale by Wagner and Bode (2008) was adapted as shown in Table 2. Of the six original items in the scale, five were used in this dissertation. The one statement "We reduce demand side risks through late product differentiation" was not used as it is outside the scope of this study. To address double barreling found in one of the original items, the item was adapted into two items. The items were measured using a 7-point Likert-type scale of   1 = "Does not apply" to 7 = "Applies very much." Wagner and Bode found all items loaded on the one factor with a Cronbach alpha of 0.79. The scale's reliability and validity were evaluated using correlation analysis, reliability evaluation, and principal component factor analysis using Varimax as the method of rotation (Wagner & Bode, 2008).

3.1.2 Risk propensity. *Risk propensity* is measured using a scale adapted from Sitkin and Weingart (1995) as shown in Table 3. Details on the development of the scale

were not provided in the original study; the only measure given was (α = 0.86). A later

study focused on validating the scale as a dependable measure of business risk

Table 2. Risk Behavior Measures

	Does not apply						Applies very much
Our organization works with our supply chain partners to make sure our supply chain is more transparent.	1	2	3	4	5	6	7
Our organization is actively pursuing ways to create a more open information sharing environment with our supply chain partners	1	2	3	4	5	6	7
Our organization has extensive business continuity/contingency plans for addressing supply chain risks	1	2	3	4	5	6	7
In our organization, an employee/team is dedicated to supply chain risk management	1	2	3	4	5	6	7
When possible, we take steps to guard against supply chain related risks	1	2	3	4	5	6	7

propensity (Huff, Keil, Kappelman, & Prybutok, 1997). That study included reliability

testing where α = 0.71 and factor analysis which initially identified two factors. A

second testing resulted in a single factor which led to the conclusion that the scale

questions were addressing the same underlying subject (Huff et al., 1997). Construct

validity was conducted to determine if the scale measured the construct it purported to

measure (Churchill, 1979). Findings supported construct validity (Huff et al., 1997). The

items were measured using a 7-point Likert type scale of 1 = "Very unlikely" to 7 =

"Very likely."

3.1.3 Risk perception. *Risk perception* is measured using a scenario adapted from

Sitkin and Weingart (1995) study which involved a modified Pat Carter scenario as the

base for measuring risk perception. A short vignette, as shown in Table 4, was written

Table 3. Risk Propensity Measures

	Very unlikely						Very likely
Assume you face a decision that affects your organization's financial future. Given this circumstance, how would you rate:							
… the likelihood that you would choose risky alternatives based on the assessment of others?	1	2	3	4	5	6	7
… the likelihood that you would choose risky alternatives which rely upon analyses high in technical complexity?	1	2	3	4	5	6	7
… the likelihood that you would choose risky alternatives which could have a major impact on the strategic direction of your organization?	1	2	3	4	5	6	7
… the likelihood that you would initiate a strategic corporate action which has the potential to backfire?	1	2	3	4	5	6	7
… the likelihood that you would support a decision when you are aware that relevant analyses were done while missing several pieces of information?	1	2	3	4	5	6	7

with questions presented in a format following the example of Sitkin and Weingart

(1995). Seven-point Likert-scales were used to answer the two questions that follow the

vignette. The first question "How would you characterize the decision faced by Albert

Standin?" posed three answers with ranges from "Significant threat" to "Significant

opportunity," "Potential for loss" to "Potential for gain," and Negative situation" to

"Positive situation." The second question "What is the likelihood of Outcome Industries

succeeding at getting the new product to market on schedule" was answered with a range

from "Very unlikely" to "Very likely."

Table 4. Risk Perception Scenario

Please read the following situation and then answer the four questions below.

Albert Standin, supply chain manager for Outcome Industries, finished reading a memo from the company's CFO regarding lower than projected sales on existing products and the importance of the company's soon to be released new product. The product is planned market introduction in two months with anticipated sales of at least four million units that could result in approximately 7% of the company's annual sales. The phone rang and it was the president of a key supplier, Partz & Partz, informing him that a fire in one of the supplier's manufacturing facilities would mean about two weeks of down time. This facility was producing a unique component designed especially for Outcome's new product. Outcome had already started manufacturing and had inventory on-hand sufficient for approximately one week. Marketing for the product had begun and any delay would have a negative impact on sales and the company's reputation.

       Outcome has a long-term relationship with Partz & Partz and a very lucrative deal had been struck on the price of the component. Albert was familiar with other companies that had experienced fires with suppliers and knew additional problems could be found in bringing facilities back into production. To seek additional suppliers that could retool operations and create the new component in time would be expensive but could get them on the market with a somewhat lower profit margin. Also, a competitive new supplier could provide an edge when negotiating future deals with Partz & Partz. Albert realized he would have to decision whether to stay with Partz & Partz and risk they will be back in operation as stated or whether to find another supplier who can get the components produced on time but at a possibly substantially higher cost.

How would you characterize the decision faced by Albert Standin?

Significant threat	1	2	3	4	5	6	7	Significant opportunity
Potential for loss	1	2	3	4	5	6	7	Potential for gain
Negative situation	1	2	3	4	5	6	7	Positive situation

What is the likelihood of Outcome Industries succeeding at getting the new product to market on schedule?

Very unlikely	1	2	3	4	5	6	7	Very likely

    3.1.4 Risk preferences. *Risk preferences* are measured using a scale adapted from

Zuckerman (1979) and incorporated into a study on venture capital by Parhankangas and

Hellstrom (2007). The scale includes seven items originally tested for internal consistency and found to have a Cronbach's alpha of 0.83. Parhankangas and Hellstrom (2007) found their seven items loaded onto the same factor. The items are measured using a 7-point Likert-type scale of 1 = "Strongly disagree" to 7 = "Strongly agree." This study incorporates five of the items used by Parhankangas and Hellstrom (2007). Two items were not included. "I like the feeling that comes with psychological or social risks" was not used as the similar item "I like the feeling that comes with physical risks" was adapted for this study to read "I like the feeling that comes with risks." The other item not included was "I like to think about doing things that would make me famous or notorious." It was deemed outside the scope of this research. The five items incorporated into the study are shown in Table 5.

Table 5. Risk Preferences Measures

	Strongly disagree						Strongly Agree
I like the feeling that comes with taking risks.	1	2	3	4	5	6	7
I like to make risk-related decisions when large sums of money are involved.	1	2	3	4	5	6	7
I like to do things that almost paralyze me with fear	1	2	3	4	5	6	7
When it comes to decisions, I consider myself a risk taker.	1	2	3	4	5	6	7
The greater the risk, the more fun the challenge.	1	2	3	4	5	6	7

3.1.5 Outcome history. *Outcome history,* as shown in Table 6, was measured using an adapted three-item outcome history manipulation check created by Sitkin and

Weingart (1995) and one item created by Pablo (1997). The Sitkin and Weingart

statements were part of a modification of the widely used Carter Racing decision-making

case study (Brittain &Sitkin, 1990). The three-statement check was found reliable ($\alpha =$

0.71) in the Sitkin and Weingart (1995) study. The Pablo (1997) item is from a three-

item scale to measure outcome history ($\alpha = 0.87$). The statements will be presented with

a Likert-type scale ranging from 1 = "Not at all" to 7 = "To a great extent."

Table 6. Outcome History Measures

	Not at all						To a great extent
To what extent have problems resulted from your past decisions involving risky situations?	1	2	3	4	5	6	7
To what degree has risk in the supply chain led to financial losses in your past experience?	1	2	3	4	5	6	7
To what degree have successful outcomes resulted from your decisions involving risk in the past?	1	2	3	4	5	6	7
To what extent have supply chain risks impacted the operation of organizations with whom you have worked?	1	2	3	4	5	6	7

3.1.6 Problem domain familiarity. *Problem domain familiarity* was measured

using items adapted from scales developed by Svennson (2002) and Ellis et al. (2010).

The three items adapted from Svennson were measured using different 7-point Likert-

type scales of 1 = "No experience" to 7 = "Very much experience," 1 = "Tiny impact" to

7 ="Huge impact," and 1 = "Very negative" to 7 = "Very positive" as shown in Table 7.

A fourth item regarding total number of supply disruptions was adopted from a one-item scale created by Ellis et al. (2010).

3.1.7 Organizational control system – process. *Organizational control system - process* was measured using survey items and a lead-in statement adapted from the Behavior-Control/Outcome Control Index Scale developed by Oliver and Anderson (1994). The items, shown in Table 8, were measured using a 7-point Likert-type scale

Table 7. Problem Domain Familiarity Measures

	No experience						Very much experience
How much experience would you say you have with supply chain disruptions?	1	2	3	4	5	6	7
	Tiny impact						Huge impact
What level of impact has past experience with supply chain disruptions colored your perception of supply chain disruption risks?	1	2	3	4	5	6	7
	Not at all familiar						Very familiar
How familiar are you with the potential ramifications of a supply chain disruption, based on your personal experience?	1	2	3	4	5	6	7
							More frequently than once per year
	Never						
How frequently have you dealt with supply chain risks when making decisions at your current or previous jobs?	1	2	3	4	5	6	7

from 1 = "Strongly disagree" to 7 = "Strongly agree" (Matsuo, 2009). The items loaded onto the one factor with α = 0.856 (Oliver & Anderson, 1994).

3.1.8 Organizational Control System – Outcome. Organizational control system -
outcome was measured using survey items adapted from the Behavior-Control/Outcome
Control Index Scale developed by Oliver and Anderson (1994). The scale includes items
tested for internal consistency and found with a Cronbach's alpha of 0.762 (Oliver &
Anderson, 1994). The items were measured using a 7-point Likert-type scale from 1 =
"Strongly disagree" to 7 = "Strongly agree" as shown in Table 9 (Matsuo, 2009).

Table 8. Organizational Control System – Process Measures

	Strongly disagree						Strongly Agree
When it comes to decisions regarding the risk of possible supply chain disruptions:							
My company's management makes sure everyone knows "what to do and how to do it."	1 2 3 4 5 6 7						
My company's management stays in close contact with me.	1 2 3 4 5 6 7						
I don't have much contact with my company's management (R)	1 2 3 4 5 6 7						
Management here stays very well informed of the company's supply chain department's activities	1 2 3 4 5 6 7						

3.1.9 Leadership influence. Leadership influence was measured using an adapted
scale used by Armitage and Conner (1999). The items were measured using a 7-point
Likert-type scale of 1 = "Strongly disagree" to 7 = "Strongly agree" as shown in Table
10. The scale has been used to measure this construct with resulting Cronbach's alpha of
0.76 and common factor analysis loading under one factor (Armitage & Conner, 1999).

Table 9. Organizational Control System – Outcome Measures

	Strongly disagree						Strongly Agree
When management rates my performance in reducing supply chain disruption risks, they take a lot of things into consideration.	1	2	3	4	5	6	7
Some portion of my employee performance rating includes or is adjusted for the number and associated costs of supply chain disruptions (R)	1	2	3	4	5	6	7
Only *tangible results* in reducing supply chain disruption risks matter to my manager (R)	1	2	3	4	5	6	7
My manager does not care what I do as long as I can demonstrate supply chain disruption risks are lowered. (R)	1	2	3	4	5	6	7

3.1.10 Managerial disruption perspective. Managerial disruption perspective was measured using an adopted scale developed by Davis, Frankforter, Vollrath, and Hill (2007). A lead-in statement was added that reads "When it comes to behaviors associated with supply chain disruptions that may be considered risky:" The scale, shown in Table 11, uses six self-reported Likert-like items ranging from 1 = "Strongly disagree" to 7 = "Strongly agree." A low score indicates the person answering the items is inclined to behave more as an agent; a high score indicates the person is inclined to behave as a steward (Godos-Diez et al., 2005). The scale was originally tested using an exploratory factor analysis which revealed the factorial structure of the scale can be viewed as a single dimension (Godos-Diez et al., 2005). Confirmatory factor analysis established the unidimensionality of the scale with results suggesting that the indicator is reliable as well as convergent (Godos-Diez et al., 2005).

45

Table 10. Leadership Influence Measures

	Strongly disagree						Strongly Agree
Members of management in my organization think I should contribute ideas that reduce risks of supply chain disruptions.	1	2	3	4	5	6	7
Members of management in my organization would encourage employees to think of ways to reduce supply chain disruption occurrences.	1	2	3	4	5	6	7
Members of management in my organization want me to reduce risks of supply chain disruptions	1	2	3	4	5	6	7
I feel under pressure from members of management to reduce the risks of supply chain disruptions	1	2	3	4	5	6	7

3.1.11 Control variables. The following control variables were included in this dissertation: age, years of experience with the organization, organization type, and organization size (Oliver & Anderson, 1994). The years of experience with the organization was used as research has found that with long-term relationships the employee is more risk-adverse and there is a lower perceived risk (Stroh, Brett, Baumann, & Reilly, 1996). Organization size is based on the number of employees in the local organization (Bode, Wagner, Petersen, and Ellram, 2011).

3.2 Analytic Approach

The analytical approach of this study was engaged in several steps. After data was collected, reverse coded items were reversed. Data was examined for missing data and outliers. Then biases were examined including response bias and common variance

bias. This was followed by assessment of scale items and then an examination of the

regression. More details for these steps are provided below.

Table 11. Managerial Disruption Perspective Measures

	Strongly disagree						Strongly Agree

When it comes to behaviors associated with potentially risky supply chain disruptions:

I am proud of the contributions I have made to our organization's plans.	1	2	3	4	5	6	7
I find that my values and the organization's values are very similar.	1	2	3	4	5	6	7
Employees acknowledge my experience in handling supply chain disruptions.	1	2	3	4	5	6	7
Frequent communications occur between employees and the management team within this organization.	1	2	3	4	5	6	7
There is a generally cooperative atmosphere within our organization toward seeking solutions.	1	2	3	4	5	6	7
Company employees are encouraged to express their own ideas and opinions.	1	2	3	4	5	6	7

3.2.1 Bias. Non-response bias occurs through failure to obtain responses from a

sizable portion of the sample and the missing responses affect variable conclusions (Yu

& Cooper, 1983). The existence of non-response bias was assessed by comparing the

means between earlier respondents and persons who respond later after a reminder, e.g.,

phone call or follow-up email (Armstrong & Overton, 1997). The two means were

compared with the variables risk preference, risk propensity, and risk perception. The

comparison was conducted using Leven's Test and T-tests. The results, shown in Table

12, indicate no statistical significance as to the possible presence of non-response bias.

Table 12. Non-Response Bias Test – Responders Before and After a Reminder Email

		n	Risk Perception	Risk Propensity	Risk Preference
Answered before reminder email	Mean	57	4.01	3.10	3.11
	Std. Deviation	57	1.16	1.33	1.39
Answered after reminder email	Mean	46	3.72	3.14	3.03
	Std. Deviation	46	0.95	0.99	1.25
Leven's Test	F		1.75	3.06	0.80
	Sig.		0.19	0.08	0.37
T-test	t		1.34	-0.17	0.26
	Sig.		0.10	0.86	0.84

The collection time took four months. A second test to assess the existence of response bias was conducted. Using the midpoint date a comparison was made of the mean and standard deviation of the first half of the responses to the second half of the responses. There was found statistically significant differences and, therefore the potential for response bias, between early responders and late responders in relationship with risk propensity (t = 2.87; p < 0.05) and risk preference (t = 2.57; p < 0.05). Late responders were less likely to have propensity to risk and to have a preference for risk than early responders. One explanation for this could be in the type of respondent. Earlier responders were more likely to be from larger organizations with a national presence. Persons contacted in the first half of the period were through the national organization membership list and attendees at the organization's annual conference. Later responses were more likely to be from smaller organizations with a regional focus. During the last two months of data collection, attention was focused more on organizations in Mississippi and Alabama. The test results are shown in Table 13.

Table 13. Response Bias Test - Early vs. Late Responders

		n	Risk Perception	Risk Propensity	Risk Preference
Early responders	Mean	49	3.73	3.45	3.43
Sept 9 to Oct 15	Std. Deviation	49	1.06	0.99	1.13
Late responders	Mean	54	3.99	2.80	2.78
Oct 16 to Jan 5	Std. Deviation	54	1.06	1.27	1.40
Leven's Test	F		0.08	2.72	2.93
	Sig.		0.78	0.12	0.90
T-test	t		-1.20	2.87	2.57
	Sig.		0.23	0.01	0.01

Data were collected using blind email sampling, through face-to-face solicitation at a national conference followed by an email with a link to the survey, and through initial phone calls followed by an email with a link to the survey. A third test was run to check for response bias within these three groups. Respondents to the blind email sampling were supply chain professionals who are members of a national supply chain managers association. Conference solicitation was to members of the same organization. The phone calls were made to organizations in Mississippi, Alabama, and Georgia. The differences in the means indicate the potential for response bias. There were significant differences in risk propensity between *blind email and conference contact* (t = 2.39; *p* < 0.05) and *blind email and telephone contact (t = 1.93; p < 0.05).* The Levene's Test for *blind email and telephone contact* reported significance with risk preference (F = 3.17; *p* < 0.05). These too could reflect the size and nature of the organizations responding. The results are shown in Table 14.

The second form of bias tested was common method variance, a concern with self-reporting, questionnaire-based measurements collected from the respondents in a

single sitting (Malhotra, Patil & Kim, 2007). This dissertation incorporates several

approaches to test for common method variance (Podsakoff et al., 2003; Podsakoff,

MacKenzie, & Podsakoff, 2012). The Harman's single-factor test, the first statistical

procedure used "in the attempt to control for common method variance" (Podsakoff &

Organ, 1986, p. 536) was conducted through a factor analysis. All variables of interest

were selected, the fixed number of factors to extract was set as 1, no rotation method was

selected and the test was run. An assumption of the Harman's single-factor test is that

Table 14. Response Bias Test – Blind Emails, Conference Contact, and Telephone Contact

		n	Risk Perception	Risk Propensity	Risk Preference
Blind email	Mean	18	3.94	3.76	3.67
	Std. Deviation	18	1.09	1.09	0.97
Conference	Mean	46	3.63	3.13	3.04
Contact	Std. Deviation	46	0.99	0.89	1.23
Telephone	Mean	39	4.14	2.81	2.85
Contact	Std. Deviation	39	1.13	1.42	1.50
Blind Email and Conference Contact					
Levene's Test	F		0.01	0.23	3.17
	Sig.		0.94	0.63	0.08
T-test	t		1.09	2.39	1.93
	Sig		0.28	0.02	0.06
Blind Email and Telephone Contact					
Levene's Test	F		0.10	1.50	4.39
	Sig.		0.76	0.23	0.04
T-test	t		-0.62	2.51	2.11
	Sig.		0.54	0.02	0.04
Conference Contact and Telephone Contact					
Levene's Test	F		0.30	5.80	1.09
	Sig.		0.59	0.18	0.30
T-test	t		-2.19	1.25	0.63
	Sig.		0.03	0.24	0.53

"common method variance is present if one 'general' factor accounts for the majority of the covariance in the independent and criterion variables" (Podsakoff & Organ, 1986 p. 536). The result of Harman's single-factor test on this study's variables was 22.61 percent, well below 50 percent indicating no common method variance.

Inserting a marker variable that is completely unrelated to the variables of interest is another approach widely used to test for common methods bias (Williams, Hartman, & Cavazotte, 2010, Podsakoff, MacKenzie, & Podsakoff, 2010). The marker variable is a variable theoretically unrelated to the significant variables in the study (Andrews, Kacmar, & Kacmar, 2015). A marker variable that correlates with the study variables represents common method variance. A 3-item marker variable was created and included to test for common method variance (Lindell & Whitney, 2001; Williams et al., 2010). This marker variable included three statements on restaurant choices. Items include "I choose restaurants based on the quality of service," "I choose restaurants based on the opinions of others," and "I choose restaurants based on the type of food." Responses were made using an 11 point Likert-type scale anchored by 1 = "Strongly disagree" and 11 = "Strongly agree."

Scale reordering is another approach utilized. This involves the reordering of questionnaire items thereby mixing the questions and altering the flow (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This was done in the survey by mixing the questions and including the control variables at approximately the midpoint of the survey. Scale item trimming, another approach to control for common methods variance,

involves eliminating items that constitute obvious overlap in what are purported to be separate measures (Podsakoff & Organ, 1986).

To ensure instrumental variables are significantly and strongly related to the predictor it represents and to verify the instrumental variables are completely uncorrelated with the structural error term for the equation a Sargan chi-square test of over-identification was used (Antonakis et al., 2010; Podsakoff, MacKenzie, & Podsakoff, 2003). The preferred findings indicate the over-identification tests result in non-significance showing the instrumental variables are unrelated to the structural error term (Podsakoff, MacKenzie, & Podsakoff, 2003).

3.2.2 Analytical assessment of hypotheses - The three models. Analysis, using SPSS and Amos, was conducted on data collected. First, the overall model was divided into three small models focusing on the three major relationships within the model. In Sitkin and Pablo's model risk perception served as a antecedent variable to risk perception while risk perception served as a moderating variable to risk perception. As a mediating variable effectively serves as an antecedent variable (MacKinnon & Fairchild, 2009), this would result in a relationship that concurrently serves as an antecedent variable while being affected by the very variable it is affecting. Sitkin and Pablo (1992) encouraged focusing on smaller sets of the model variables to further test the interactions of the relationships among the variables in the model. Testing and dividing the model accordingly. Sitkin and Weingart (1995) used a similar strategy to test a section of the original Sitkin and Pablo (1992) model. The relationship of risk preferences and outcome

history on risk propensity and risk propensity's relationship with risk behavior are addressed in Model 1 shown in Figure 3.

Figure 3. Model 1
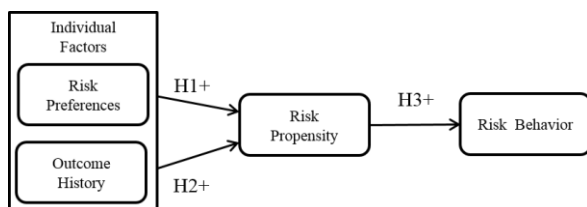
As shown in Figure 4, Model 2 focuses on how risk propensity, problem domain familiarity, leadership influence, organizational control system process, and organizational control system outcome, influence risk preference.

Model 3 focuses on the relationship of risk perception and risk behavior and the inclusion of moderators. Two possible moderation relationships are analyzed: managerial disruption perspective's potential moderation of the risk perception relationship to risk behavior linkage and risk perception's potential moderation of the risk

Figure 4. Model 2
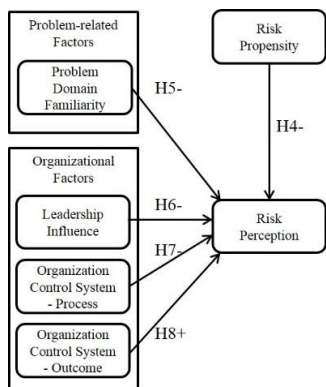
propensity relationship to risk behavior linkage, a relationship previously tested in Model 1. Model 3 is shown in Figure 5.

Confirmatory factor analyses (CFAs) were conducted on each model. Items were reduced based upon the following model fit criteria: CMIN/DF (minimum discrepancy divided by degrees of freedom) (normed Chi-Square) with a value between 2 and 5

Figure 5. Model 3
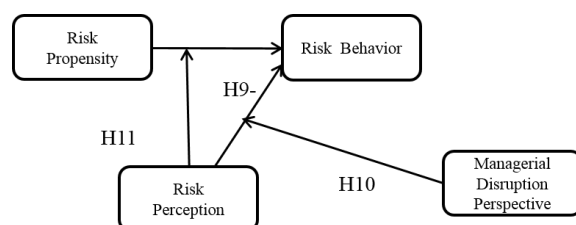
acceptable but less than to 2.0 represents an adequate fit, CFI (comparative fit index) exceeding the guidelines of >0.9, RMSEA of < 0.06, and GFI (goodness of fit index) above the 0.9 guideline (Brown & Cudeck, 1993, Byrne, 1989, Hair et al, 2010, Hu & Bentler, 1999).

The analysis examined convergent reliability, validity convergent, and discriminate validity. Convergent validity was examined by reviewing loading estimates (standardized regression weights) using loading guidelines of 0.5 minimum with a preferable 0.7; variance extracted measures that equal or exceed 50 percent; and construct reliabilities that equal or exceed 0.7 (Fornell & Larcker, 1981). A rule of thumb is for the AVE of 0.5 or higher indicates adequate convergent validity. In addition, construct

reliabilities are examined. Alpha values between 0.7 and 0.9 are considered as satisfactory (Robinson, Shaver, & Wrightsman, 1991). Next, discriminate validity was examined. Discriminant validity is demonstrated when the AVE estimates are larger than the corresponding SIC estimates.

The final steps in the analysis included running regressions on each model to determine support or provide lack of support for hypothesized linkages. Support was determined by examining the beta of the coefficients, t-values, and statistical significance of each construct. A two-step process was used that involved first, testing the control variables with the dependent variable, and second, testing the independent variables, and control variables with the dependent variable. The values were compared to check for the influence of the control variables, as well as the difference made by the independent variables.

Moderation analysis was used to test whether the magnitude of a variable's effect on an outcome variable depends on a third variable (Baron & Kenny, 1986). To test for moderation, variables were created by multiplying the moderating variables by the independent variables that they propose to moderate.

3.3 Survey Participants and Data Collection

3.3.1. Survey participants and required sample. The most relevant population for this study is supply chain managers. To reach supply chain managers, the survey was administered to purchasing and supply executives. Members of a national supply chain management professional organization and employees of firms and organizations in

Southern states of the United States were selected. Companies were selected with more than 50 employees to better ensure a position dedicated to supply chain and purchasing.

3.3.2 Sample Size. Dividing the model into three parts lowered the number of observations needed to test each model. According to Hair et al. (2010) a sample size minimum of 100 is needed for models with five or fewer constructs and a minimum of 150 for models with seven constructs or less. In identifying sample size, using a conservative ratio, ten observations for each construct was reported optimal by Miller and Kunce (1973) and Halinski and Feldt (1970).

The first and third models have four constructs. Sitkin and Weingart (1995) tested a similar model with four constructs using a sample size of 38 respondents. They conducted a second test using three constructs and a sample size of 62. The second model has six constructs. While a data set of more than 100 observations is optimal, Pablo (1997) used a sample size of 58 to test a model with six constructs. Using the conservative number of ten observations and Hair's sample size for smaller models, a sample size of 100 would be a minimum.

3.3.3 The pilot study. A pilot study was conducted in which 39 supply chain managers working with companies in southeast Alabama were mailed the survey. A reminder call was made approximately a week after the surveys were mailed. All returned surveys but one were fully completed. Those completing the survey were offered an incentive of $10 cash, a $10 donation to Wounded Warrior Project, or no compensation. From this pilot study was drawn the conclusion that people would complete the survey.

The response rate for this mailed survey was 36 percent with 14 completed surveys returned.

Changes were made to the survey instrument following the pilot study. A measure of firm size by "number of employees" was added as a control variable. Firm size may affect a firm's organizational actions and inertia (Bode, Wagner, Petersen, & Ellram, 2011; Chattopadhyay et al., 2001). The risk perception scenario question was moved forward to become the second set of questions to take advantage of the idea that as an early response, the question will more likely be completed (Schuman & Presser, 1981). The survey incorporated Likert-type scales with a seven point range. Dillman, Smyth, and Christian (2009) stated this is an optimal number of response categories with more scale points yielding only modest gains in reliability and validity. To help avoid question order effects questions were listed in no discernible order (Dillman, Smyth, & Christian, 2009). Two of the four items associated with the scenario were reversed questions. These were changed to give a consistency to the answers and cut the likelihood of incorrect recording of answers when analyzing the data.

3.3.4 Final data collection. Final data for this research were gathered from September 2014 to January 2015. Potential respondents were sent an email that included a solicitation for the person's participation in the research, an explanation of the research, a promise of confidentiality, and a link to the survey. As incentive, each participant was offered a choice of ten dollars cash, a ten dollar donation to Wounded Warrior Project, or

no incentive. A follow-up email was sent approximately one week after the initial email.

For each contact, the survey remained open for approximately two weeks.

To collect responses for this research, emails were first sent to a random 1,000

names members purchased from and selected by a national supply chain management

organization. Mississippi, Alabama, and Georgia were excluded from this list. The initial

emailing to the national organization was anticipated to provide the responses. But if the

responses were not received, then companies and organizations from these three states

would be contacted using other available sources. By not including these three states in

the initial mailing, it would help lower the possibility of duplicate responses if these

additional contacts were needed (Steel, Schwendig, & Kilpatrick, 1992).

After experiencing a low response rate from this initial emailing, additional steps

were taken. I attended the late September annual conference of the same national supply

chain management and asked attendees with whom I came in contact to participate in the

research. Those agreeing were sent the email. Once they had been emailed and sent a

reminder, additional responses were still needed. Direct telephone contacts were then

made with firms and organizations in Alabama, Georgia, and Mississippi identified

through manufacturing directories and listings found on the Internet. This took a bit

more than two months but the final result was more than 100 complete responses.

Two hundred manufacturing firms with more than 50 employees in or with

facilities in Mississippi were also emailed surveys. One hundred seven supply chain

professionals identified through an Internet directory and conference attendance lists

were emailed with no response. The completed responses for the three e-mailings to 1,307 people were 35 responses started (2.68 percent) and 25 fully completed (1.91 percent).

Attendees of the above national supply chain management organization's annual conference were personally contacted and asked to participate in the research. Emails were sent to 109 who agreed to participate. The results were 65 responses started (59.6 percent) with 53 completed surveys submitted of which two included unanswered questions. This resulted in a total of 51 fully completed responses (46.8 percent).

Telephone solicitation was then incorporated using industrial lists from Mississippi, Georgia, and Alabama, making sure to not use persons who earlier received e-mailed requests. A total of 143 calls were made in which contact was made with the potential participant. Two declined due to company policies on surveys and two were not interested. Of the 139 persons sent an email with a link to the survey, 27 surveys were submitted and all were fully completed responses for a response rate of 19.4 percent. The sample size of 1,551 resulted in a total of 127 responses (8.19 percent). Twenty-two were submitted incomplete and an additional two were removed for missing data. This resulted in 103 complete, usable responses with an overall response rate of 6.64 percent.

CHAPTER 4

RESULTS

4.1 Overview

This chapter presents the results of the analysis of this data collected for this study. CFAs were conducted and additional analyses were conducted to support the constructs' validity and reliability. To determine hypotheses support, regression analysis was conducted. The interrelationships and correlations of the constructs, as well as findings from the testing of the hypotheses are presented.

4.2 Evaluating the Measurement Models

4.2.1 Evaluating model 1. The first measurement model focuses on the constructs of risk preferences, outcome history, risk propensity, and risk behavior. The model was initially tested using a total of 19 items to measure the four constructs. The inclusion of the 3-item marker variable, choosing restaurants, increased the total items to 22. Included in the CFA were the four control variables: age, years of experience, focus of the organization, and number of employees.

The initial CFA reported a model fit (CMIN/DF = 1.48, CFI = .87, RMSEA = .07, and GFI = .795, $p < 0.001$) with the CFI (.87) below the guideline of >0.9 (Hair et al., 2010). One item on the outcome history construct reported a negative standardized regression weight. This item was removed and another CFA was conducted. The second

CFA resulted in a 21-item model. All items were positive and acceptable fit was reported. Factor loadings for the final measurement model are summarized in Table 15.

Table 15. Model 1 – Final Factor Loads

Item	Factor Loading
Factor - Risk Behavior	
Our organization works with our supply chain partners to make sure our supply chain is more transparent.	0.87
Our organization is actively pursuing ways to create a more open information sharing.	0.89
Our organization has extensive business continuity/contingency plans for addressing supply chain risks.	0.65
In our organization, an employee/team is dedicated to supply chain risk management.	0.58
When possible, we take steps to guard against supply chain related risks.	0.59
Factor - Risk Preferences	
I like the feeling that comes with taking risks.	0.79
I like to make risk-related decisions when large sums of money are involved.	0.82
I like to do things that almost paralyze me with fear	0.60
When it comes to decisions, I consider myself a risk taker.	0.84
The greater the risk, the more fun the challenge.	0.84
Factor – Outcome History	
To what extent have problems resulted from your past decisions involving risky situations?	0.63
To what degree has risk in the supply chain led to financial losses in your past experience?	0.86
To what extent have supply chain risks impacted the operation of organizations with whom you have worked?	0.58
Factor - Risk Propensity	
Assume you face a decision that affects your organization's financial future. Given this circumstance, how would you rate:	
… the likelihood that you would choose risky alternatives based on the assessment of others?	0.73
… the likelihood that you would choose risky alternatives which rely upon analyses high in technical complexity?	0.70
… the likelihood that you would choose risky alternatives which could have a major impact on the strategic direction of your organization?	0.84
… the likelihood that you would initiate a strategic corporate action which has the potential to backfire?	0.72
… the likelihood that you would support a decision when you are aware that relevant analyses were done while missing several pieces of information?	0.53
Marker Variable – Choosing Restaurants	
I choose restaurants based on the quality of service	0.92
I choose restaurants based on the opinions of others	0.18
I choose restaurants based on the type of food	0.47

The second CFA with the resulting 21-item model suggests acceptable model fit (CMIN /DF = 1.43, CFI = .88, RMSEA = .065 and GFI = .81, $p < 0.001$). The reliability, for the four constructs as reported using Cronbach's alpha, were risk behavior = 0.85, risk preference = 0.83, outcome history = 0.71, and risk propensity = 0.83. The marker variable did not report acceptable reliability (0.44). The alphas and the model fit are summarized in Table 16.

Table 16. Model 1 - Alphas and Model Fit Indices

Construct				Alpha
Risk Behavior				0.85
Risk Preferences				0.83
Outcome History				0.71
Risk Propensity				0.83
Choosing Restaurants				0.44

Model Fit	CMIN/DF	CFI	RMSEA	GFI
Initial 22-item Model*	1.48	.87	.07	.795
Final 21-item Model*	1.43	.88	.065	.81

CMIN/DF = Discrepancy Minimum Value/Degrees of Freedom;
CFI = Comparative Fit Index; RMSEA = Root-Mean-Square Error of
Approximation; GFI = Goodness of Fit

4.2.1.1 Discriminant Validity. To test for discriminant validity, the Fornell-Larcker (1981) criterion was used. To provide evidence of discriminant validity, the variance extracted should be greater than the square of the correlation between the model factors. Of the four model constructs three reached the AVE guideline of 0.50 minimum or higher (Hair et al., 2011). The AVE for outcome history was 0.49. The AVE for the marker variable choosing restaurants was 0.34. AVE totals are shown in Table 17. The variance explained (AVE) was greater than the correlation between the model factors,

thereby exhibiting discriminant validity. This is reported in Table 17. The table also includes the mean and standard deviation (SD) for each model construct.

4.2.1.2 Common Methods Variance. To test for common methods variance, the correlations between the variables were reviewed (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). As shown in Table 17 low correlations between the control variables and the other variables suggest common methods variance concerns are less of an issue.

4.2.1.3 Findings from the Discriminant Validity Scale Statistics. The highest correlation as reported in Table 17 is between risk preference and risk propensity. This statistically significant relationship (0.35, $p < 0.001$) appears to support the hypothesis of this study that risk preference is a predictor of risk propensity. Significance exists between the construct risk behavior and the control variable number of employees (0.04, $p < 0.1$). One possible conclusion from this is that an organization's number of employees affects risk behavior. Significance exists between the construct outcome history and the control variable years with current employer (0.01, $p < 0.1$). One possible conclusion from this is that those responding have likely been working with the organization long enough to develop a history with risk behavior outcomes.

4.2.1.4 Hypotheses Testing. Hypothesis 1 and Hypothesis 2 predict a positive relationship with risk propensity. Linear regressions were run to test these hypotheses. Given the low overall construct correlations, the marker variable was not included in the regressions. The first regression was with the control variables only. For the second regression, the constructs were added. Overall, the model provided an R^2 of 0.28. This represents a change in R^2 of 0.25 with a significant ($p < 0.001$) F change (F[4,98] =

Table 17. Model 1 - Discriminant Validity Scale Statistics

Correlations (squared), AVE, Means, and Standard Deviation

	RB	RP	OH	PRO	MV	AGE	YRS	FCS	EMP
RB	**0.53**								
RP	0.06***	**0.62**							
OH	0.02	0.07***	**0.49**						
PRO	0.01	0.35*	0.04	**0.51**					
MV	0.11***	0.01	0.00	0.00	**0.35**				
AGE	0.00	0.00	0.00	0.01	0.03	---			
YRS	0.00	0.01	0.04****	0.00	0.04	0.05***	---		
FCS	0.00	0.00	0.02	0.00	0.00	0.01	0.01	---	
EMP	0.04****	0.02	0.00	0.03	0.03	0.05***	0.03****	0.04****	---
Mean	4.71	3.08	4.70	3.12	8.38	3.20	3.40	2.41	3.70
SD	1.53	1.32	1.25	1.18	1.54	1.31	1.47	1.65	1.42

n = 103; Significant at *$p < 0.001$, **$p < 0.01$, ***$p < 0.05$, ****$p < 0.1$

RB = Risk Behavior; RP = Risk Preference; OH = Outcome History; PRO = Risk Propensity; MV = marker variable Choosing Restaurants; Control Variables: AGE = age; YRS = Years with Current Employer; FCS = Focus of the Organization; EMP = Number of Employees; SD = Standard deviation

AVE for each construct is shown in bold on the diagonal.

16.76) from the first regression with control variables only ($R^2 = 0.03$). Hypothesis 1 states that an individual's risk preference is positively associated with the individual's propensity to take risk. A significant positive relationship was reported ($\beta = .48$; $p < 0.001$). The results indicate the hypothesis is supported. In Hypothesis 2 the relationship between outcome history and risk propensity was not statistically significant and was not supported. Table 18 presents the results of regression tests for these two hypotheses.

Hypothesis 3 posited a positive relationship between an individual's risk propensity and risk behavior. This hypothesis was not supported as it was not statistical significant. The model provided an R^2 of 0.04. There was no R^2 change between the two regressions. The regression does report significance in the relationship between risk behavior and number of employees ($\beta = 0.21$; $p < 0.1$). As stated earlier, the number of employees at the organization does appear to affect an individual's risk behavior. This

Table 18. Risk Preference and Outcome History Predicting Risk Propensity

Dependent variable: Risk Propensity
Independent variables: Risk Preference, Outcome History
Control variables: Age, Years at Organization, Number of Employees, Company Focus

Step 1. Control Variables

Construct	B	t-value
Age	-0.04	-0.39
Years at Organization	-0.03	-0.29
Number of Employees	0.15	1.41
Company Focus	-0.59	-0.57
R^2	0.03	
Adjusted R^2	-0.01	
Change in R^2	0.03	
F change	0.73	

Step 2. Independent Variables and Control Variables

Construct	B	t-value
Risk Preference	0.48*	5.30
Outcome History	-0.08	-0.88
Age	-0.04	-0.47
Years at Organization	0.02	0.19
Number of Employees	0.08	0.91
Company Focus	-0.05	-0.50
R^2	0.28	
Adjusted R^2	0.24	
Change in R^2	0.25	
F change	16.76*	
n = 103; Significant at *$p <0$ .001, **$p < 0.01$, ***$p <0$ .05, ****$p < 0.1$		

relationship is reported in regressions run for the hypotheses where risk behavior is the

dependent variable. Results of this regression analysis are reported in Table 19.

4.2.2 Evaluating Model 2. The second measurement model consists of six multi-

item constructs – risk propensity, problem domain familiarity, leadership influence,

organization control system-process, organization control system-outcome, and risk

Table 19. Hypotheses 3 – Risk Propensity Predicting Risk Behavior

Dependent variable: Risk Behavior

Step 1. Control Variables

Construct	B	t-value
Age	0.06	0.62
Years at Organization	0.03	0.33
Number of Employees	0.21***	1.99
Company Focus	-0.05	-0.54
R^2	0.04	
Adjusted R^2	0.001	
Change in R^2	0.04	
F change	1.02	

Step 2. Independent Variable and Control Variables

Construct	B	t-value
Risk Propensity	0.01	0.08
Age	0.06	0.62
Years at Organization	0.03	0.33
Number of Employees	0.21****	1.95
Company Focus	-0.05	-0.53
R^2	0.04	
Adjusted R^2	0.01	
Change in R^2	0.00	
F change	0.01	

n = 103; Significant at *$p < 0.001$, **$p < 0.01$, ***$p < 0.05$, ****$p < 0.1$

perception - and the three-item marker variable. These constructs were measured initially

with 28 items. The CFA included the four control variables: age, years, of experience,

focus of the organization, and number of employees.

The initial CFA reported a negative variance on one of the organization control

system outcome variables. The negative item was removed and the CFA ran without

further inadmissible negative variance. The initial model fit reported a CFI < 0.9 and a

GFI < 0.8 (CMIN/DF = 1.49; CFI = 0.89; RMSEA = 0.08; and GFI = 0.77).

Two additional CFAs were run. A second item under organization control system outcome was eliminated. There was a difference in the four scale items. The two items removed dealt with management rating the individual's performance. The two remaining questions dealt with management wanting results. The items removed exhibited low standardized regression weights that resulted in AVEs below 0.50. Removing these problem items under organization control system-outcome resulted in a two-item construct with an AVE of 0.56.

In the final CFA a risk perception item was removed. Three of the four risk perception items were reporting regression weights less than 0.05. The item "Potential for Loss/Potential for Gain" was removed. The wording this question appears to have been broader in definition than the other items used to measure risk perception. The words loss and gain have multiple meanings and people could interpret its meaning here differently. After removing the one item with a high regression weight (0.809), the other three items reported weights more than 0.5. The resulting three-measure construct still exhibited a low AVE (0.33) and low Cronbach's alpha (0.59). Additional analysis was conducted removing an item, but this made no improvements in the AVE. As there was already a two-item construct in this model, no further action was taken. The final model contains 25 items and the model had acceptable fit (CMIN/DF = 1.29, CFI = 0.93; RMSEA = 0.05; GFI = 0.82). Factor loadings for the final measurement model are summarized in Table 20. Alphas and the model fit are summarized in Table 21.

Table 20. Model 2 - Final Factor Loadings

Item	Factor Loading
Factor - Risk Propensity	
Assume you face a decision that affects your organization's financial future. Given this circumstance, how would you rate:	
… the likelihood that you would choose risky alternatives based on the assessment of others?	0.72
… the likelihood that you would choose risky alternatives which rely upon analyses high in technical complexity?	0.71
… the likelihood that you would choose risky alternatives which could have a major impact on the strategic direction of your organization?	0.86
… the likelihood that you would initiate a strategic corporate action which has the potential to backfire?	0.71
… the likelihood that you would support a decision when you are aware that relevant analyses were done while missing several pieces of information?	0.53
Factor – Problem Domain Familiarity	
How much experience would you say you have with supply chain disruptions?	0.78
What level of impact has past experience with supply chain disruptions colored your perception of supply chain disruption risks?	0.65
How familiar are you with the potential ramifications of a supply chain disruption, based on your personal experience?	0.78
How frequently have you dealt with supply chain risks when making decisions at your current or previous jobs?	0.71
Factor – Leadership Influence	
Members of management in my organization think I should contribute ideas that reduce risks of supply chain disruptions	0.94
Members of management in my organization would encourage employees to think of ways to reduce supply chain disruption occurrences.	0.81
Members of management in my organization want me to reduce risks of supply chain disruptions	0.94
I feel under pressure from members of management to reduce the risks of supply chain disruptions	0.51
Factor – Organization Control System-Process	
When it comes to decisions regarding the risk of possible supply chain disruptions	
My company's management makes sure everyone knows "what to do and how to do it."	0.80
My company's management stays in close contact with me.	0.93
I don't have much contact with my company's management (R)	0.64
Management here stays very well informed of the company's supply chain department's activities	0.82
Factor – Organization Control System – Outcome	
Only tangible results in reducing supply chain disruption risks matter to my manager.	0.46
My manager does not care what I do as long as I can demonstrate supply chain disruption risks are lowered.	0.96
Factor – Risk Perception	
How would you characterize the decision faced by Albert Standin?	
Significant threat/Significant opportunity	0.48
Negative situation/Positive situation	0.66
What is the likelihood of Outcome Industries succeeding at getting the new product to market on schedule?	
Very unlikely/Very likely	0.53

Marker Variable – Choosing Restaurants

I choose restaurants based on the quality of service	0.79
I choose restaurants based on the opinions of others	0.26
I choose restaurants based on the type of food	0.53

Table 21. Model 2 - Alpha and Model Fit Indices

Construct	Alpha
Risk Propensity	0.83
Problem Domain Familiarity	0.81
Leadership Influence	0.86
Organization Control System-Process	0.86
Organization Control System-Outcome	0.44[a]
Risk Perception	0.57
Choosing Restaurants	0.44

Model Fit Indices	CMIN/DF	CFI	RMSEA	GFI
Initial 28-item Model*	1.77	0.79	0.09	0.75
Final 25-item Model**	1.25	0.93	0.05	0.81

CMIN/DF = Discrepancy Minimum Value/Degrees of Freedom ; CFI = Comparative Fit Index, RMSEA = Root-Mean-Square Error of Approximation, GFI = Goodness of Fit Index; [a]two-factor construct correlation

4.2.2.1 Discriminant validity. When reviewing the variance extracted, the AVE of all constructs was greater than the square of the correlation between the factor and other factors to provide evidence of discriminant validity. All constructs thereby exhibited discriminant validity. This is reported in Table 22.

4.2.2.2 Common methods variance. To test for common methods variance, the correlations between the variables were reviewed (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The low correlations suggest common methods variance concerns are less of an issue.   The results are shown in Table 22.

4.2.2.3 Findings from the discriminant validity scales statistics. A significant relationship ($p < 0.05$) was identified between problem domain familiarity and the control

variable age. One conclusion from this is that with age comes familiarity with the

problem domain. A significant relationship (p < 0.01) was also found between leadership

influence and organizational focus. A possible conclusion from this is that the

importance supply chain professionals give to the influence of leadership important

influence in risk behavior decisions appears to be affected the organization's focus.

The marker variable was statistically significant with problem domain familiarity,

leadership influence, outcome control system – process, and outcome control system –

outcome. This may result from survey participants associating the decision to try new

restaurants as having risk. The significance and correlation are discounted by the low

AVE (0.35) and low alpha (44) found with this variable.

Table 22. Model 2 - Discriminant Validity Scale Statistics

	PRO	PDF	LI	OCSP	OCSO	RPC	MV	AGE	YRS	FCS
PRO	**0.51**									
PDF	0.00	**0.53**								
LI	0.02	0.38*	**0.68**							
OCSP	0.01	0.09***	0.20*	**0.65**						
OCSO	0.05***	0.03	0.00	0.06***	**0.58**					
RPC	0.01	0.02	0.00	0.10***	0.05	**0.32**				
MV	0.00	0.15***	0.19**	0.36**	0.08***	0.00	**0.32**			
AGE	0.01	0.06***	0.00	0.00	0.02	0.02	0.04	---		
YRS	0.00	0.01	0.00	0.00	0.00	0.03	0.05****	0.05***	**---**	
FCS	0.00	0.01	0.09**	0.01	0.00	0.03	0.00***	0.01	0.01	---
EMP	0.02	0.00	0.00	0.01	0.02	0.00	0.02	0.05***	0.03****	0.04****
Mean	3.12	5.46	5.21	5.28	4.37	3.80	8.38	3.20	3.40	2.41
SD	1.18	1.15	1.38	1.42	1.55	1.15	1.54	1.31	1.47	1.65

n = 103; Significant at *p < 0.001, **p < 0.01, ***p <0.05, ****p < 0.1

PRO = Risk Propensity; PDF = Problem Domain Familiarity; LI – Leadership Influence; OCSP = Organization Control System – Process; OCSO = Organization Control System – Output; RPC = Risk Perception; MV = marker variable Choosing Restaurants; Control variables: AGE = Age; YRS = Years with current employer; FCS = Focus of the Organization; EMP = Number of Employees; SD = Standard deviation.

4.2.2.4 Hypotheses testing. Hypotheses 4 through 7 predict a negative

relationship with risk perception. Hypothesis 8 predicts a positive relationship with risk

perception. Linear regressions were run to test these hypotheses. Given the low overall construct correlations, the marker variable was not included in the regressions. Each regression was first run with the control variables and the dependent variable. A second regression added the independent variables. Differences in R^2 between the regressions are reported.

Hypothesis 4 states an individual's risk propensity is negatively associated with the individual's level of risk perception. The findings were not found to be statistically significant. Therefore, Hypothesis 4 is not supported. Hypothesis 5 states an individual's level of problem domain familiarity is negatively associated to the individual's risk perception. Hypothesis 6 states leadership influence is negatively associated with the individual's risk perception. However, statistical significance was not found for either Hypothesis 5 or Hypothesis 6 and therefore, they were not supported.

Hypothesis 7 states an organizational control system based on process is negatively associated with an individual's risk perception. The result for this was positive and significant ($\beta = 0.29$; $p < 0.05$). Therefore, Hypothesis 7 was not supported. Past research has stated that in organizations with control systems individuals perceive lower risks and people are more risk adverse (Sitkin & Pablo, 1992; Cravens, et. al, 1993). This finding could reflect the weakness of the construct (AVE $= 0.32$; $\alpha = 0.57$). Hypothesis 8 proposes a positive association of an organizational control system based on outcome. Hypothesis 8 was not found to be statistically significant and was not supported. The R^2 for the control variables was 0.04; for the control variables and

independent variables 0.13. Adding the independent variables changed the R^2 value

(0.09). The regression tests findings for these hypotheses are exhibited in Table 23.

Table 23. Predicting Risk Perception

Step 1. Control Variables

Construct	B	t-value
Age	0.04	0.39
Years at Organization	0.16	1.50
Number of Employees	0.04	0.36
Company Focus	-0.14	-1.32
R^2	0.04	
Adjusted R^2	0.001	
Change in R^2	0.04	
F change	1.03	

Step 2. Independent Variables and Control Variables

Construct	β	t-value
Risk Propensity	0.08	1.10
Problem Domain Familiarity	0.11	1.30
Leadership Influence	-0.19	-1.42
Organizational Control System Process	0.29***	2.57
Organizational Control System Outcome	-0.12	-1.20
Age	0.03	0.28
Years at Organization	0.14	1.14
Number of Employees	0.02	0.15
Company Focus	-0.18****	-1.69
R^2	0.13	
Adjusted R^2	0.04	
Change in R^2	0.09	
F change	1.86	
n = 103; Significant at *$p < 0.001$, **$p < 0.01$, ***$p < 0.05$, ****$p < 0.1$		

4.2.3 Evaluating model 3. The third measurement model includes four constructs

– risk propensity, risk perception, managerial disruption perspective, and risk behavior -

and the three-item marker variable. with 23 items. The CFA included the four control

variables: age, years of experience, focus of the organization, and number of employees. The initial CFA resulted with the construct risk perception reporting an AVE below 0.5 and poor model fit (CMIN/DF = 1.78; CFI = 0.82; RMSEA = 0.09; GFI = 0.76). The same item that was a problem in the second model on risk perception reported a standardized regression weight below 0.5. It was removed and the CFA was conducted again. This resulted in an increased AVE on risk perception (0.41) but not above 0.5. To improve model fit a managerial disruption perspective item and then a risk behavior item were removed. The managerial disruption perspective item focused on the individual's pride while the other items involved the individual and interaction with the organization, employees and management team. The risk behavior item removed dealt with having business continuity/contingency plans for addressing supply chain risk. The other risk behavior scale items included action such as works, pursuing, and taking steps. The model fit improved (CMIN/DF = 1.50; CFI = 0.86; RMSEA = 0.07; GFI = 0.80). The results of the final CFA with the final 20-item model are presented in Table 24 and Table 25.

4.2.3.1 Discriminant validity. Discriminant validity was verified using Table 26. The variance extracted is greater that the square of the correlation between the factor and other factors to provide evidence of discriminant validity. All four constructs exhibited discriminant validity.

4.2.3.2 Common methods variance. To test for common methods variance, the correlations between the variables were reviewed (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). As shown in Table 26 the control variables have low correlations with

the independent variables suggesting common methods variance concerns are less of an

issue.

Table 24. Model 3 – Final Factor Loads

Item	Factor Loading
Factor - Risk Propensity	
Assume you face a decision that affects your organization's financial future. Given this circumstance, how would you rate:	
… the likelihood that you would choose risky alternatives based on the assessment of others?	0.71
… the likelihood that you would choose risky alternatives which rely upon analyses high in technical complexity?	0.71
… the likelihood that you would choose risky alternatives which could have a major impact on the strategic direction of your organization?	0.86
… the likelihood that you would initiate a strategic corporate action which has the potential to backfire?	0.71
… the likelihood that you would support a decision when you are aware that relevant analyses were done while missing several pieces of information?	0.51
Factor – Risk Behavior	
Our organization works with our supply chain partners to make sure our supply chain is more transparent.	0.86
Our organization is actively pursuing ways to create a more open information sharing environment with our supply chain partners.	0.92
In our organization, an employee/team is dedicated to supply chain risk management.	0.55
When possible, we take steps to guard against supply chain related risks.	0.55
Factor – Risk Perception	
How would you characterize the decision faced by Albert Standin?	
Significant threat/Significant opportunity	0.49
Negative situation/Positive situation	0.72
What is the likelihood of Outcome Industries succeeding at getting the new product to market on schedule?	0.51
Factor – Managerial Disruption Perspective	
When it comes to behaviors associated with potentially risky supply chain disruptions:	
I find that my values and the organization's values are very similar.	0.74
Employees acknowledge my experience in handling supply chain disruptions.	0.54
Frequent communications occur between employees and the management team within this organization.	0.89
There is a generally cooperative atmosphere within our organization toward seeking solutions.	0.80
Company employees are encouraged to express their own ideas and opinions.	0.81
Marker Variable – Choosing Restaurants	
I choose restaurants based on the quality of service	0.50
I choose restaurants based on the opinions of others	0.40
I choose restaurants based on the type of food	0.65

Table 25. Model 3 − Alphas and Model Fit Indices

Construct	Alpha
Risk Propensity	0.83
Risk Behavior	0.81
Risk Perception	0.64
Managerial Disruption Perspective	0.87
Choosing Restaurants	0.44

Model	CMIN/DF	CFI	RMSEA	GFI
Initial 23-item Model*	1.78	0.82	0.09	0.76
Final 20-item Model*	1.50	0.86	0.07	0.80

CMIN/DF = Discrepancy Minimum Value/Degrees of Freedom;
CFI = Comparative Fit Index; RMSEA = Root-Mean-Square Error of
Approximation; GFI = Goodness of Fit Index

4.2.3.3. Findings from the discriminant validity scale statistics. The variable risk perception reported significance with risk propensity ($p < 0.05$), risk behavior ($p < 0.01$), and managerial disruption perspective ($p < 0.05$). This could possibly be attributed to the variable's lack of reliability. Once again the findings show the significance of the risk behavior/number of employees relationship ($p < 0.1$).

Table 26. Model 3 - Discriminant Validity Scale Statistics

	PRO	RB	RPC	MDP	MV	AGE	YRS	FCS	EMP
PRO	**0.50**								
RB	0.01	**0.55**							
RPC	0.15**	0.05****	**0.36**						
MDP	0.00	0.22*	0.05***	**0.59**					
MV	0.01	0.12***	0.01	0.30**	**0.42**				
AGE	0.01	0.00	0.01	0.00	0.06****	---			
YRS	0.00	0.00	0.00	0.02	0.08****	0.05***	---		
FCS	0.00	0.00	0.01	0.00	0.00	0.01	0.01	---	
EMP	0.02	0.03****	0.01	0.00	0.02	0.05***	0.03****	0.04****	---
Mean	3.11	4.70	3.88	5.46	8.38	3.21	3.38	2.37	3.69
SD	1.19	1.52	1.12	1.19	1.54	1.32	1.45	1.64	1.41

n = 103; Significant at *p < 0.001, **p < 0.01, ***p <0.05, ****p < 0.1

PRO = Risk Propensity; RB = Risk Behavior; RPC = Risk Perception; MDP =
Managerial Disruption Perspective. MV = Marker variable Choosing Restaurants;
Control variables: AGE = Age; YRS = Years with Current Employer; FCS = Focus of
the Organization; EMP = Number of Employees. SD = Standard deviation.

4.2.3.4 Hypotheses testing. Hypothesis 9 predicts a negative relationship with the individual's risk perception and the individual's undertaking of risk behavior. A linear regression was run to test the hypothesis. Given the low overall construct correlations, the marker variable was not included in the regressions. The first was run with the control variables with a resulting R^2 of 0.036. The second regression in which the independent variable was added resulted in an R^2 of 0.044. The relationship was not statistically significant. There was a slight change in R^2 of 0.007 in the two regressions. The results, as reported in Table 27, indicate the hypothesis is not supported.

Hypothesis 10 predicts that an individual's managerial disruption perspective has a moderating association with the relationship between risk perception and risk behavior. The hypothesis was tested through moderated linear regressions. When managerial disruption perspective was tested with the construct risk perception, the interaction was not significant. However, the relationship between managerial description perspective and risk behavior was significant, indicating a direct linkage ($\beta = 0.46$; $p < 0.001$). The model provided an R^2 of 0.24 when adding the second independent variable managerial disruption perspective compared to R^2 of 0.04 in Table 27, Step 2. This is a change in R^2 of 0.20 with a significant ($p < 0.001$) F change (F[1, 96 = 24.35). The results of this linear regression are reported in Table 28.

A regression was run to test for moderation. For this regression a moderator variable was created by multiplying risk perception and managerial disruption perspective. Risk perception was found to have a significant negative relationship with risk behavior ($\beta = -0.65$; $p < 0.1$). The moderator risk perception*managerial disruption

perspective was found to be a significant moderator of the risk behavior/risk perception

relationship ($\beta = 0.88$; $p < 0.1$). Hypothesis 10 was supported. Overall, the moderator

provided an R^2 of 0.26. This represents a change in R^2 of 0.02 with a significant ($p < 0.1$)

F change (F[1,95] = 3.02) when the moderator was added. The findings are reported in

Table 29.

Table 27. Hypothesis 9 – Predicting Risk Behavior with Risk Perception

Step 1. Control Variables

Construct	B	t-value
Age	0.06	0.54
Years at Organization	0.01	0.08
Number of Employees	0.20****	1.89
Company Focus	-0.05	-0.52
R^2	0.036	
Adjusted R^2	-0.003	
Change in R^2	0.36	
F change	0.93	

Step 2. Independent Variable and Control Variables

Construct	B	t-value
Risk Perception	0.09	0.86
Age	0.05	0.50
Years at Organization	-0.01	-0.05
Number of Employees	0.19****	1.86
Company Focus	-0.04	-0.40
R^2	0.044	
Adjusted R^2	-0.01	
Change in R^2	0.007	
F change	0.74	
n = 103; Significant at *p < 0.001, **p < 0.01, ***p <0.05, ****p < 0.1		

Table 28. Hypothesis 10 – Predicting Risk Behavior with Risk Perception and Managerial Disruption Perspective – Direct Paths

Construct	β	t-value
Risk Perception	0.001	0.01
Managerial Disruption Perspective	0.46*	4.94
Age	0.09	0.93
Years at Organization	-0.07	-0.78
Number of Employees	0.17****	1.79
Company Focus	-0.03	-0.37
R^2	0.24	
Adjusted R^2	0.19	
Change in R^2	0.20	
F change	24.35*	
n = 103; Significant at *$p < 0.001$, **$p < 0.01$, ***$p < 0.05$, ****$p < 0.1$		

Table 29. Hypothesis 10 - Examining Moderation Effects of Managerial Disruption Perspective on the Risk Behavior/Risk Perception Relationship – Direct and Moderated Paths

Construct	β	t-value
Risk Perception	-0.65****	-1.69
Managerial Disruption Perspective	-0.004	-0.15
Risk Perception*Managerial Disruption Perspective	0.88****	1.74
Age	0.05	0.57
Years at Organization	-0.08	-0.80
Number of Employees	0.15	1.55
Company Focus	-0.04	-0.46
R^2	0.26	
Adjusted R^2	0.21	
Change in R^2	0.02	
F change	3.02****	
n = 103; Significant at *$p < 0.001$, **$p < 0.01$, ***$p < 0.05$, ****$p < 0.1$		

Hypothesis 11 predicts an individual's risk perception has a moderating association with the relationship between risk propensity and risk behavior. To test if

risk perception moderates this relationship, linear regressions were run. The first

regression tests the control variables. The second tests the relationship between risk

propensity and risk perception and risk behavior. This regression reported no significant

in the relationship between risk perception and risk. The model provided an R^2 of 0.05

when adding the independent variables. This is a 0.01change in R^2 compared to the R^2 of

0.4 in the regression with the control variables. The findings are reported in Table 30.

Another regression was run to test for moderation. For this regression a

moderator variable was created by multiplying risk propensity and risk perception. The

relationship was found to not be statistically significant. Hypothesis 11 is not supported.

Overall, the model provided an R^2 of 0.05 with no change when the moderator variable

was added. The findings are reported in Table 31.

Table 30. Hypothesis 11 – Predicting Risk Propensity/Risk Behavior with Risk
Perception – Direct Paths

Step 1. Control Variables

Construct	β	t-value
Age	0.06	0.54
Years at Organization	0.01	0.08
Number of Employees	0.20****	1.89
Company Focus	-0.05	-0.52
R^2	0.04	
Adjusted R^2	-0.003	
Change in R^2	0.04	
F change	0.93	

Step 2. Control Variables and Independent Variables

Construct	β	t-value
Risk Propensity	0.05	0.52
Risk Perception	0.09	0.83
Age	0.05	0.52
Years at Organization	-0.004	-0.03
Number of Employees	0.19****	1.77
Company Focus	-0.04	-0.38
R^2	0.05	
Adjusted R^2	-0.01	
Change in R^2	0.01	
F change	0.48	
n = 103; Significant at *$p < 0.001$, **$p < 0.01$, ***$p < 0.05$, ****$p < 0.1$		

Table 31 Hypothesis 11 – Examining Moderation Effect of Risk Perception on the Risk Propensity/Risk Behavior Relationship – Direct and Moderated Paths

Construct	β	t-value
Risk Propensity	-0.11	-0.31
Risk Perception	-0.03	-0.10
Risk Propensity*Risk Perception	0.20	0.45
Age	0.06	0.52
Years at Organization	-0.001	-0.01
Number of Employees	0.19***	1.80
Company Focus	-0.49	-0.46
R^2	0.05	
Adjusted R^2	-0.02	
Change in R^2	0.00	
F change	0.21	
n = 103; Significant at *p < 0.001, **p < 0.01, ***p <0.05, ****p < 0.1		

CHAPTER 5

DISCUSSION

5.1 Overview

This chapter discusses the dissertation research results, while presenting

implications, further research ideas, and recommendations for scholars interested in

investigating the results presented. First, the chapter summarizes and discusses the

research findings. The research's managerial and academic implications then follow.

This is followed by study limitations, future research suggestions, and conclusions.

5.2 Discussion

This study examined the Sitkin and Pablo (1992) model regarding its ability to

serve as a valid fit to measure a supply chain manager's risk propensity and risk

perception. The study also looked at whether an individual's managerial disruption

perspective affects a person's risk perceptions with regards to behaviors involving risk.

This study seeks to contribute to the understanding of an individual's orientation to risky

behavior. It contributes to this understanding as well by expanding the identification of

variables, such as managerial disruption perspective, that explain a person's reasons for

the actions taken is a situation involving risk.

To examine the Sitkin and Pablo (1992) model, the model was divided into three

separate models. This technique was used by both Sitkin and Weingart (1995) and Pablo

(1997) to study portions of the model. In the first model, risk preference and outcome

history were evaluated as independent variables influencing risk propensity. In the second model, risk propensity, problem domain familiarity, leadership influence, operation control system processes, and operation control system outcome were evaluated as independent variables influencing risk perception. In the third model risk perception was evaluated as an independent variable influencing risk perception, as well as a moderator of risk propensity's influence on risk behavior. Managerial disruption perspective was also evaluated as a moderator of the influence risk perception has on risk behavior.

     5.2.1 Discussion of the first model.   In the first model risk preferences and outcome history are presented as antecedents of an individual's risk propensity. Hypothesis 1 predicted an individual's risk preferences are positively associated with the individual's risk propensity. Testing this through regression reported a significant positive relationship ($\beta = 0.48$, $p < 0.001$) supporting Hypothesis 1. This differs with the finding of Pablo (1997) where the positive relationship did not achieve statistical significance. This difference in findings could relate to how risk preference is presented. Pablo's scale involved pursing business situations and preferences in participating in business situations that are "characterized by strategic risk, financial risk, and technological risk" (Pablo, 1997, p. 11). This dissertation uses a scale that focuses on the excitement, fear, and challenges associated with risk (Zuckerman, 1979; Parhankangas & Hellstrom, 2007). There is also a difference in the persons participating in the study. Pablo bases her findings on 58 businessmen and my 103 person sample includes male and female supply chain professionals. From this we can surmise that the survey

questions and characteristics of selected respondents could affect the statistical significance of the results.

Hypothesis 2 predicted an individual's outcome history is positively associated with the individual's risk propensity. In this study this hypothesis was not statistical significance. This differs from Pablo's (1997) finding of a statistical significant relationship. Pablo's scale centered on situations where the more risky alternative was chosen by the respondent. This study used a combination of items from Sitkin and Weingart (1995) and Pablo (1997) with items focusing more on past situations in which the respondent participated or of which the respondent was aware. The context of the questions and the respondents may have again been sufficient to affect the findings.

One of Sitkin and Pablo model's key concepts was the idea that risk propensity served to mediate the relationship between an individual's risk preferences and outcome histories and risk behavior. The relationship is not statistically supported. This study used supply chain managers who work in an environment with rules, processes, and professional standards. Their personal propensity to risk does not appear to affect their behavior when presented with an action involving risk. Analysis also found that the control variables in this study explain four percent of the construct risk behavior. When risk propensity was added this percentage did not change. There are other factors outside the scope of this model that affect a person's risk behavior in a work related situation. This finding agrees with the earlier findings of Sitkin and Weingart (1995) that risk propensity does not have a significant relationship with risk behavior and does not serve as a determinant of risk behavior.

Low correlations were found between all factors in this model. The highest

correlation was 0.36 reported between risk preference and risk propensity ($p < 0.001$).

All other correlations were 0.05 or less. The low correlation of the factors and the failure

of the relationships to achieve statistical significance also suggest risk propensity is not

an important determinate of an individual's risk behavior within a supply chain context.

There is also significant correlation between risk behavior and the control variable

number of employees ($p < 0.1$). This significance is also reported in the regressions ($\beta =$

0.21; $p < 0.1$). This would indicate the larger the organization the more likely the person

is to take risk.

5.2.2 Discussion of the Second Model. In the second model, risk propensity,

problem domain familiarity, leadership influence, operation control system processes,

and operation control system outcome were evaluated as independent variables predicting

risk perception. The only predictor in this group found statistically significant was risk

propensity, which was hypothesized to have a negative relationship with risk perception.

Analysis found a statistically significant positive relationship however, a negative

relationship had been hypothesized. Organizational control system based on process was

found to have a positive significance on risk perception ($\beta = 0.29$; $p < 0.05$), which does

not support this study's hypothesis of a negative relationship. This model also resulted in

low correlation of the constructs. These two results suggest that this portion of the model

would not serve as an important determinate of an individual's risk perception within a

supply chain context. The scenario-based scale used in this study may not be the most

appropriate for testing the model. Sitkin and Weingart (1995) used the same scale and

did not find statistical significance. Analysis found this construct to have low reliability (AVE = 0.32; α = 0.57). Before accepting this finding a different scale should be developed and included in researching this relationship.

5.2.3 Discussion of the third model. In the third model risk perception was evaluated two ways. First, as an independent variable influencing risk perception. Second, as a moderator of risk propensity's influence on risk behavior. Hypothesis 9 predicts risk perception being positively related to risk behavior. This relation was statistically insignificant.

This study introduces managerial disruption perspective to the model. The factor managerial disruption perspective reported was found to explain 20 percent of risk behavior. This relationship was not predicted in this study. The study hypothesized about managerial disruption perspective's role as a moderator in the relationship between risk propensity and risk behavior. Hypothesis 10 predicted an individual's managerial disruption perspective has a moderating association with the relationship between risk perception and risk behavior. Managerial disruption perspective, when tested as a moderator, was statistically significant and was strong enough to provide statistical significance to the risk perception/risk behavior relationship.

Hypothesis 11 predicted an individual's risk perception has a moderating association with the relationship between risk propensity and risk behavior. This relationship was not found to be statistically significant and make no change the R^2 value. This could again be attributed to the low reliability found in the construct risk perception.

As with the other two models, this model resulted in low correlation of the constructs. There was found significance in the relationship of managerial disruption perspective to risk behavior. Past research has found that managers have different characteristics and have different motivations (e.g. Hambrick & Mason, 1984; Mitchell, 1982). Their motives affect their approach to their organization (Davis, Schoorman, & Donaldson, 1997). The significance found in this study supports the addition of this factor to explain an individual's risk behavior through its direct relationship and as its moderation on risk perspective.

5.2.4 Discussion of Managerial Implications. In managing supply chains, nothing is more essential than having the right person with the right skills in the key position (Slone, Dittman, & Mentzer, 2010). Supply chain managers by the very nature of their job are faced with situations that involve risk. What affects the supply chain manager's actions when faced with risk situations can help define the type of person an organization needs to have in the position.

This study found an individual's perception of risk is partially explained by their propensity to risk. Their risk perception is also influenced by the process controls as set by the organization. Supply chain managers appear to pay more attention to the organization's structured processes to determine the amount of individual risk perceived in a situation. The greater emphasis placed on following the prescribed process, the lower the perception of risks. Yet supply chain managers do not let their perception of personal risks influence the actions they take toward risky behaviors.

A direct relationship between risk behaviors and a person's managerial disruption perspective was not predicted in this study. This could affect the type of incentives designed to motivate the supply chain professional. The person may be motivated by intrinsic incentives such as income, working conditions, and status (Cadoz-Diez et al, 2005) or by extrinsic factors such as achievement, personal satisfaction, and recognition (Caldwell et al., 2008; Davis et al., 1997). Understanding this could keep the supply chain motivated and committed to the organization.

One last finding from this study regarding supply chain managers is that supply chain managers take their responsibilities seriously and follow the set procedures when a situation arises. While they may have risk-related propensities, they do not interfere with their decisions. They are true professionals who serve an important role for the company.

5.2.5 Discussion of Academic Implications. Current understanding of the role that supply chain managers serve in addressing or eliminating disruption risks and vulnerabilities is deficient. One potential avenue to help fill this deficiency is a foundational study performed by Sitkin and Pablo (1992). They proposed a conceptual model focused on specific predictors of an individual's risk behavior from the individual, organizational, and problem-related perspectives. A key contribution of their conceptual model is positing risk propensity and risk perception as mediators of risk behavior. This challenges the direct effect model used by research on risk behavior.

Risk propensity and risk perception appear not to be the predictors of risk behavior as originally proposed by the Sitkin and Pablo model. Sitkin and Weingart (1995) found preliminary significant support for the mediating relationships. This current

study did not concur with the Sitkin and Weingart finding. Neither factor was found to have significance in their roles as mediators. My research supports the study by Pablo (1997) where significant support was not found for risk propensity predicting risk behavior. While my findings to not resolve the issue, it does point out the need for further research before more conclusive results can be achieved. The weakness of the construct risk perception cannot be discounted in my findings. The use of a different scale that strengthens the reliability of the construct may result in different findings.

Sitkin and Pablo (1992) posited the use of risk perception as a predictor of risk behavior fallacious. The relationship of risk perception to risk behavior had been suggested by past research, but the two authors' analysis did not support the relationship. This current study fails to find statistical significance between risk perception and risk behavior, thereby supporting Sitkin and Pablo's concerns.

This dissertation hypothesized that managerial disruption perception could serve as a moderator of the risk perception and risk behavior relationship. Managerial disruption perspective was found to have a direct relationship with risk behavior. This supports Godos-Diez et al. (2011) who also found it to significantly explain a substantial amount of situation factors. This supports the use of this construct as a direct predictor of a manager's behavior when faced with situational factors in their organization (Davis et al., 1977). As a moderator, managerial disruption perspective appeared to impact on the relationship of risk perception and risk behavior. When it was added as a moderator, as earlier reported, the relationship of risk perception and risk behavior became statistically significant. While Sitkin and Pablo (1992) refer to this relationship as fallacious, it there

is significant support that a person's managerial disruption perspective may affect the impact of risk perception on risk behavior.

Our findings advance extant literature by providing insight into the relationship of risk propensity and risk perception on risk behavior. We offer empirical support that an individual's risk behavior is not predicted by an individual's risk propensity and risk perception. Our work contributes to existing literature regarding the effect that an individual's managerial disruption perspective has on risk behavior.

5.3 Limitations

This study is limited by the sample size. The number of usable responses (n = 103) meets minimum standards. This number of usable responses can be justified when compared to other studies researching constructs included in this dissertation that have used sample sizes similar to our study. For example, Pablo (1987) used a sample size of 58 oil executives, Sitkin and Weingart (1995) used 38 MBA students, and Anderson and Mellor used a sample of 97 for a portion of their research. But it remains that a larger sample size would produce more stable solutions.

Data collection presented the study with another limitation. Reminder calls were made after the initial receipt of the surveys. This provides a possibility of response bias. However, there was no statistical significance on this distinction. A second factor was the four month period over which data were collected. Statistically significance between earlier and later responders on risk propensity and risk preference provided indication of possible response bias. The data collection also involved blind emails, direct contact at a national conference, and telephone contact lending the data to additional potential bias.

There was a statistically significant difference between those who responded to the blind emails versus those who responded to direct contact or to telephone contact. In the original emailing to 1,000 supply chain professionals more than 75% of those sent the email ignored it completely. The personal contact approaches increased the person's awareness and willingness to answer the survey. As one person stated contact by phone told me, email requests for participating in research are numerous and often ignored, but because of the personal contact, he would participate. Those personally contacted may have felt more obligation as they were asked for permission to email them a link to the survey.

The survey instrument also affected the number of usable responses. Thirteen people exited the survey upon reaching a question which included a two-paragraph scenario located early in the survey. This question may not have been such a strong deterrent if it had been the last question.

5.4 Future research

This study supports the importance of managerial disruption perspective in better understanding behaviors to take when faced with decisions involving risk. Some of the variables included in this study were shown to not influence risk behavior. The need exists for future research to identify additional direct influencers of risk behavior. Sitkin and Weingart (1995) first suggested other variables could be integrated into future research.

Future research should continue to identify and develop scales to better measure and predict risk behavior. Researchers as late as 2008 found a lack of formal scales

designed for supply chain management research (Wagner & Bode, 2008). Supply chain management is a developing field of research. For future research to result in quality findings, attention should be paid to refining additional measures and scales.

With increasing research in supply chain management, there is the likelihood of survey fatigue. The low response rate for this research reflects the inundation with emails requesting participation in research surveys. Future research in supply chain management needs to identify avenues which will result in a higher access to data without being dependent on self-reporting surveys.

5.5 Conclusion

Risk propensity and risk perception do not appear to predict an individual's risk behavior in a supply chain context. This research set out to test whether the Sitkin and Pablo model would be a good measure for testing supply chain professionals. Based on this research, the Sitkin and Pablo (1992) model produces limited results when used as a predictor of an individual's risk behavior. The limitations of this study should motivate scholars to further investigate this model and subject. The lack of statistical significance should lead to efforts to determine factors that better explain an individual's risk behavior. Managerial disruption perspective was added and found to directly influence an individual risk behavior and to moderate the relationship of risk perception and risk behavior. Further, continued theory development is warranted to identify other variables linked to personal, problem-related, and organizational factors explaining an individual's risk behavior.

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Ajzen, I. (2002). Residual effects of past on later behavior: habituation and reasoned action perspectives. *Personality and Social Psychology Review, 6*(2), 107-122.

Ajzen, I., & Driver, B. L. (1991). Prediction of leisure participation from behavioral, normative, and control beliefs: An application of the theory of planned behavior. *Leisure Sciences, 13*(3), 185-204.

Altay, N., & Ramirez, A. (2010). Impact of disasters on firms in different sectors: Implications for supply chains. *Journal of Supply Chain Management, 46*(4), 59-80.

Armitage, C. J., & Conner, M. (1999). Distinguishing perceptions of control from Self-Efficacy: Predicting consumption of a Low-Fat diet using the theory of planned Behavior. *Journal of Applied Social Psychology, 29*(1), 72-90.

Armstrong, J. S. & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research*, *14*(3), 396-402.

Arthurs, J. D., & Busenitz, L. W. (2003). The boundaries and limitations of agency theory and stewardship theory in the venture capitalist/entrepreneur relationship*. *Entrepreneurship Theory and Practice, 28*(2), 145-162.

Autry, C. W. & Bobbitt, L. M. (2008). Supply chain security orientation: conceptual development and a proposed framework. *International Journal of Logistics Management, 19*(1), 42-64.

Baird, I. S., & Thomas, H. (1985). Toward a contingency model of strategic risk taking. *Academy of Management Review, 10*(2), 230-243.

Barbosa, S. D., Gerhardt, M. W., & Kickul, J. R. (2007). The role of cognitive style and risk preference on entrepreneurial self-efficacy and entrepreneurial intentions. *Journal of Leadership and Organizational Studies, 13*(4), 86-103.

Baron, R. M., & Kenny, A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Basadur, M. (2004). Leading others to think innovatively together: Creative leadership. *The Leadership Quarterly, 15*(1), 103-121.

Bode, C., Wagner, S. M., Petersen, K. J., & Ellram, L. M. (2011). Understanding responses to supply chain disruptions: Insights from information processing and resource dependence perspectives. *Academy of Management Journal, 54*(4), 833-856.

Bogers, R. P., Brug, J., Van Assema, P., & Dagnelie, P. C. (2004). Explaining fruit and vegetable consumption: The theory of planned behaviour and misconception of personal intake levels. *Appetite, 42*(2), 157-166.

Brachinger, H. W., & Weber, M. (1997). Risk as a primitive: a survey of measures of perceived risk. *Operations-Research-Spectrum, 19*(4), 235-250.

Brittain, J., & Sitkin, S. B. (1990). Facts, figures, and organizational decisions: Carter racing and quantitative analysis in the organizational behavior classroom. *Journal of Management Education, 14*(1), 62-81.

Brockhaus, R. H. (1980). Risk taking propensity of entrepreneurs. *Academy of Management Journal, 23*(3), 509-520.

Bromiley, P., & Curley, S. P. (1992). Individual differences in risk taking. In J. F. Yates (Ed.), *Risk-taking behavior* (pp. 87-132). West Sussex, England: John Wiley & Sons.

Brown, M. W. & Cudeck, R. (1993). Alternative ways of assessing model fit. In Bollen, K. A., & Long, J. S. [Eds]. *Testing structural equation models.* Newbury Park, CA: Sage. 136-162.

Business Continuity Institute. (2013). *Supply chain resilience 2013.* (Annual survey No. 4th Annual Survey). Caversham, United Kingdom: Zurich Insurance Group.

Byrne, B. M. (1989). *A primer of LISREL: Basic applications and programming for confirmatory factor analytic models.* New York: Springer Verlag.

Caldwell, C., Hayes, L. A., Bernal, P., & Karri, R. (2008). Ethical stewardship–
implications for leadership and trust. *Journal of Business Ethics, 78*(1-2), 153-164.

Chattopadhyay, P., Glick, W. H., & Huber, G. P. (2001) Organizational actions in
response to threats and opportunities. *Academy of Management Journal*, 44(5), 937-955.

Cho, J., & Lee, J. (2006). An integrated model of risk and risk-reducing strategies.
Journal of Business Research, 59(1), 112-120.

Chopra, S., & Sodhi, M. S. (2004). Managing risk to avoid supply-chain breakdown.
Sloan Management Review, 46(1), 53-61.

Churchill, G. A., Jr. (1979). A paradigm for developing better measures of Marketing
Constructs. *Journal of Marketing Research, 16*(1), 64-73.

Coff, R. W. (2002). Human capital, shared expertise, and the likelihood of impasse in
corporate acquisitions. *Journal of Management, 28*(1), 107-128.

Conchar, M. P., Zinkhan, G. M., Peters, C., & Olavarrieta, S. (2004). An integrated
framework for the conceptualization of consumers' perceived-risk processing.
Journal of the Academy of Marketing Science, 32(4), 418-436.

Cottrill, K., & Rice Jr., J. B. (2013) The psychology of risk. *Supply Chain Management
Review, January/February*, *17*(1), 10-11.

Cowan, D. A. (1986). Developing a process model of problem recognition. *Academy of
Management Review, 11*(4), 763-776.

Cravens, D. W., Ingram, T. N., LaForge, R. W., & Young, C. E. (1993). Behavior-based
and outcome-based salesforce control systems. *The Journal of Marketing, 57*(1), 47-59.

Daft, R. L., & Weick, K. E. (1984). Toward a model of organizations as interpretation
systems. *Academy of Management Review, 9*(2), 284-295.

Das, T. K., & Teng, B. (1997). Time and entrepreneurial risk behavior. *Entrepreneurship
Theory and Practice, 22*(2), 69-88.

Davis, J., Frankforter, S., Vollrath, D., & Hill, V. (2007). An empirical test of
stewardship theory. *Journal of Business and Leadership Research, Practice, and
Teaching, 3*(1), 40-50.

Davis, J. H., Schoorman, F. D., & Donaldson, L. (1997). Toward a stewardship theory of management. *Academy of Management Review, 22*(1), 20-47.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2007). *Mail and internet surveys: The tailored design method.* Hoboken, NJ: John Wiley & Sons. Ed. 3.

Dimov, D. P., & Shepherd, D. A. (2005). Human capital theory and venture capital firms: Exploring "home runs" and "strike outs". *Journal of Business Venturing, 20*(1), 1-21.

Douglas, M., & Wildavsky, A. B. (1983). *Risk and culture: An essay on the selection of technological and environmental dangers*. Berkeley: University of California Press.

Dowling, G. R. (1986). Perceived risk: the concept and its measurement. *Psychology & Marketing, 3*(3), 193-210.

Dowling, G. R., & Staelin, R. (1994). A model of perceived risk and risk-handling activity, *Journal of Consumer Research*, *21*(1), 119-134.

Eisenhardt, K. M. (1985). Organizational and Economic Approaches. *Management Science, 31*(2), 134-149.

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review, 14*(1), 57-74.

Ellis, S. C., Henry, R. M., & Shockley, J. (2010). Buyer perceptions of supply disruption risk: A behavioral view and empirical assessment. *Journal of Operations Management, 28*(1), 34-46.

Ellis, S. C., Shockley, J., & Henry, R. M. (2011). Making sense of supply disruption risk research: A conceptual framework grounded in enactment theory. *Journal of Supply Chain Management, 47*(2), 65-96.

Faden, C. (2014). Boosting firm performance: Working capital management & supply risk chain steering as drivers. *Optimizing firm performance* (pp. 111-140) Springer.

Farrell, M. A. (2000). Developing a market-oriented learning organisation. *Australian Journal of Management, 25*(2), 201-222.

Fiol, C. M., & Lyles, M. A. (1985). Organizational learning. *Academy of Management Review, 10*(4), 803-813.

Fischhoff, B. (1992). Giving advice: decision theory perspectives on sexual assault. *American Psychologist, 47*(4), 577-588.

Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior*. New York: Psychology Press.

Forlani, D., Mullins, J. W., & Walker, Jr., O. C. (2002). New product decision making How chance and size of loss influence what marketing managers see and do. *Psychology & Marketing, 19*(11), 957-981.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39-50

Giunipero, L. C., & Eltantawy, R. A. (2004). Securing the upstream supply chain: A risk management approach. *International Journal of Physical Distribution & Logistics Management, 34*(9), 698-713.

Godos-Díez, J., Fernández-Gago, R., & Martínez-Campillo, A. (2011). How important are CEOs to CSR practices? An analysis of the mediating effect of the perceived role of ethics and social responsibility. *Journal of Business Ethics, 98*(4), 531-548.

Guthrie, C. (2002). Prospect theory, risk preference, and the law. *Northwestern University Law Review, 97*(3), 1115-1163.

Hair, J., J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis.* (Seventh Ed.). Upper Saddle River, NJ: Pearson.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review, 9*(2), 193-206.

Hendricks, K. B., & Singhal, V. R. (2003). The effect of supply chain glitches on shareholder wealth. *Journal of Operations Management, 21*(5), 501-522.

Hernandez, M. (2012). Toward an understanding of the psychology of stewardship. *Academy of Management Review, 37*(2), 172-193.

Highhouse, S., & Yuce, P. (1996). Perspectives, perceptions and risk-taking behavior. *Organizational Behavior and Human Decision Processes, 39*(2), 264-77.

Hofmann, H., Busse, C., Bode, C., & Henke, M. (2013). Sustainability-related supply chain risks: Conceptualization and management. *Business Strategy and the Environment, 23*(1), 160-172.

Hollenbeck, J. R., Ilgen, D. R., Phillips, J. M., & Hedlund, J. (1994). Decision risk in dynamic two-stage contexts: beyond the status quo. *Journal of Applied Psychology, 79*(4), 592-98.

Hsee, C. K., & Weber, E. U. (1999). Cross-national differences in risk preference and lay predictions. *Journal of Behavioral Decision Making, 12*(2), 165-179.

Hu, L.T., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structural analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55.

Huff, R. A., Keil, M., Kappelman, L., & Prybutok, V. (1997). Validation of the Sitkin-Weingart risk propensity scale. *Management Research News, 20*(12), 39-48.

Hult, G. T. M., Craighead, C. W., & Ketchen Jr, D. J. (2010). Risk uncertainty and supply chain decisions: A real options perspective. *Decision Sciences, 41*(3), 435-458.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305-360.

Jüttner, U. (2005). Supply chain risk management: Understanding the business requirements from a practitioner perspective. *International Journal of Logistics Management, the, 16*(1), 120-141.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society, 47*(2), 263-291.

Katz, Y. J. (2002). Attitudes affecting college students' preferences for distance learning. *Journal of Computer Assisted Learning, 18*(1), 2-9.

Keil, M., Tan, B. C. Y., Wei, K, Saarinen, T., Tuunainen, V., & Wassenaar, A. (2000). A cross-cultural study on escalation of commitment behavior in software projects. *MIS Quarterly, (24)*2, 299-325.

Kleindorfer, P. R., & Saad, G. H. (2005). Managing disruption risks in supply chains. *Production and Operations Management, 14*(1), 53-68.

Kliem, R. L., & Ludin, I. S. (1997). *Reducing Project Risk*. Publishing, Hampshire, England.

Kotter, J. P. (2001). What leaders really do. *Harvard Business Review, 79*(11), 85-98.

Langley, J. (2012). *2013 17th annual third-party logistics study.* Capgemini Consulting.

Levitt, B., & March, J. G. (1988). Organizational learning. *Annual Review of Sociology, 14*(1), 319-340.

Li, J., & Tang, Y. (2010). CEO hubris and firm risk taking in china: The moderating role of managerial discretion. *Academy of Management Journal, 53*(1), 45-68.

Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review, 21*(1), 135-172.

MacCrimmon, K. R., & Wehrung, D. A., (1984). The Risk In-Basket. *Journal of Business*, 57(3), 367-387.

MacKinnon, D. P., & Fairchild, A. J. (2009). Current directions in mediation analysis. *Current Directions in Psychological Science*, 18(1), 16-20.

Mangan, J., & Christopher, M. (2005). Management development and the supply chain manager of the future. *International Journal of Logistics Management, 16*(2), 178-191.

March, J. G. & Shapira, Z. (1987). Managerial perspectives on risk and risk taking. *Managerial Science, 33*(11), 1404-1418.

Martynov, A. (2009). Agents or stewards? Linking managerial behavior and moral development. *Journal of Business Ethics, 90*(2), 239-249.

Matsuo, M. (2009). The influence of sales management control on innovativeness of sales departments. *Journal of Personal Selling and Sales Management, 29*(4), 321-332.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*(3), 709-734.

McCarter, M. W., Mahoney, J. T., & Northcraft, G. B. (2011). Testing the waters: Using collective real options to manage the social dilemma of strategic alliances. *Academy of Management Review, 36*(4), 621-640.

Miller, D. E. and Kunce, J. T. (1973). Prediction and Statistical overkill revisited. Mitchell, T. R. (1982). Motivation: New Directions for Theory, Research, and Practice. *Academy of Management Review, 7*(1), 80-88.

Mitchell, V.W. (1995). Organizational risk perception and reduction: A literature review. *British Journal of Management, 6*(2), 115-133.

Neilson, W. & Stowe, J. (2002). A further examination of cumulative prospect theory parameterizations. *Journal of Risk and Uncertainty, 24*(1), 31-46.

Nicholson, N., Soane, E., Fenton-O'Creevy, M., & Willman, P. (2005). Personality and domain-specific risk taking. *Journal of Risk Research, 8*(2), 157-176.

Nilsson, H., Rieskamp, J. & Wagenmakers, E. (2011). Hierarchical Bayesian parameter estimation for cumulative prospect theory. *Journal of Mathematical Psychology, 55*(1), 84-93.

Norrman, A., & Jansson, U. (2004). Ericsson's proactive supply chain risk management approach after a serious sub-supplier accident. *International Journal of Physical Distribution & Logistics Management, 34*(5), 434-456.

Oliver, R. L., & Anderson, E. (1994). An empirical test of the consequences of behavior- and outcome-based sales control systems. *The Journal of Marketing, 58*(4), 53-67.

Osborn, R. N., & Jackson, D. H. (1988). Leaders, riverboat gamblers, or purposeful unintended consequences in the management of complex, dangerous technologies. *Academy of Management Journal, 31*(4), 924-947.

Ouchi, W. G. (1977). The relationship between organizational structure and organizational control. *Administrative Science Quarterly, 22*(1), 95-113.

Pablo, A. L. (1997). Reconciling predictions of decision making under risk: Insights from a reconceptualized model of risk behavior. *Journal of Managerial Psychology, 12*(1), 4-20.

Pablo, A. L., & Javidan, M. (2002). Thinking of a merger . . . do you know their risk propensity profile? *Organizational Dynamics, 30*(3), 2026-222.

Pablo, A. L., Sitkin, S. B., & Jemison, D. B. (1996). Acquisition decision-making processes: The central role of risk. *Journal of Management, 22*(5), 723-746.

Parhankangas, A., & Hellström, T. (2007). How experience and perceptions shape risky behaviour: Evidence from the venture capital industry. *Venture Capital, 9*(3), 183-205.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.Y, & Podsakoff, N. P. (2003) Common method bias in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903.

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 63*(1), 539-69.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management, 12*(4), 531-544.

Rao, S., & Goldsby, T. J. (2009). Supply chain risks: A review and typology. *International Journal of Logistics Management, 20*(1), 97-123.

Rivis, A., & Sheeran, P. (2003). Descriptive norms as an additional predictor in the theory of planned behaviour: A meta-analysis. *Current Psychology, 22*(3), 218-233.

Robinson, J. P., Shaver, P. R. & Wrightsman, L. S. (1991). Criteria for scale selection and evaluation. In *Measures of Personality and Social Psychological Attitudes*, Robinson, J. P., Shaver, P. R., & Wrightsman, L. S. (eds.). San Diego, CA: Academic Press.

Sandberg, E. (2007). Logistics collaboration in supply chains: Practice vs. theory. *International Journal of Logistics Management, the, 18*(2), 274-293.

Schneider, S. L., & Lopes, L. L. (1986). Reflection in preferences under risk: Who and when may suggest why. *Journal of Experimental Psychology: Human Perception and Performance, 12*(4), 535.

Schuman, H., & Presser, S. (1981). *Questions and answers in attitude surveys: experiments on question form, wording, and context.* New York: Academic Press.

Sheffi, Y. (2005). The resilient enterprise: Overcoming vulnerability for competitive advantage. *Cambridge, MA: MIT Press Books.*

Shepherd, D. A. (2003). Learning from business failure: Propositions of grief recovery for the self-employed. *Academy of Management Review, 28*(2), 318-328.

Sitkin, S. B., & Pablo, A. L. (1992). Reconceptualizing the determinants of risk behavior. *Academy of Management Review, 17*(1), 9-38.

Sitkin, S. B., & Weingart, L. R. (1995). Determinants of risky decision-making behavior: A test of the mediating role of risk perceptions and propensity. *Academy of Management Journal, 38*(6), 1573-1592.

Sjoberg, L. (2000). Factors in risk perception. *Risk Analysis, 20*(1), 1-11.

Slone, R. E., Dittman, J. P., & Mentzer, J. T. (2010). The new supply chain agenda: The 5 steps that drive real value. Boston: Harvard Business School Publishing Corporation.

Slovic, P. (1972). Information processing, situation specificity, and the generality of risk-taking behavior. *Journal of Personality and Social Psychology, 22*(1), 128.

Snell, S. A. (1992). Control theory in strategic human resource management: the mediating effect of administrative information. *Academy of Management Journal, 35*(2), 292-327.

Sodhi, M. S., Son, B., & Tang, C. S. (2012). Researchers' perspectives on supply chain risk management. *Production and Operations Management, 21*(1), 1-13.

Starmer, C. (2000). Developments in non-expected utility theory: the hunt for a descriptive theory of choice under risk. *Journal of Economic Literature, 38*(2), 332-382.

Staw, B. M., Sandelands, L. E., & Dutton, J. E. (1981). Threat-rigidity effects in organizational behavior: A multilevel analysis. *Administrative Science Quarterly, 26*(4), 501-524.

Stecke, K. E., & Kumar, S. (2009). Sources of supply chain disruptions, factors that breed vulnerability, and mitigating strategies. *Journal of Marketing Channels, 16*(3), 193-226.

Stroh, L. K., Brett, J. M., Baumann, J. P. & Reilly, A. H. (1996). Agency theory and variable pay compensation strategies. *Academy of Management Journal, 39*(3), 751-767.

Svensson, G. (2002). A conceptual framework of vulnerability in firms' inbound and outbound logistics flows. *International Journal of Physical Distribution & Logistics Management, 32*(2), 110-134.

Taylor, L. A., Hall, P. D., Cosier, R. A., & Goodwin, V. L. (1996). Outcome feedback effects on risk propensity in an MCPLP task. *Journal of Management, 22*(2), 299-311.

Thaler, R. H., & Johnson, E. J. (1990). Gambling with the house money and trying to break even: The effects of prior outcomes on risky choice. *Management Science, 36*(6), 643-660.

Thompson, J. D. (1967). Organizations in Action. New York: McGraw-Hill.

Ulaga, W., & Reinartz, W. J. (2011). Hybrid offerings: How manufacturing firms combine goods and services successfully. *Journal of Marketing, 75*(6), 5-23.

van der Pligt, J. (1998). Perceived risk and vulnerability as predictors of precautionary behaviour. *British Journal of Health Psychology, 3*(1), 1-14.

Wagner, S. M., & Bode, C. (2006). An empirical investigation into supply chain vulnerability. *Journal of Purchasing and Supply Management, 12*(6), 301-312.

Wagner, S. M., & Bode, C. (2008). An empirical examination of supply chain performance along several dimensions of risk. *Journal of Business Logistics, 29*(1), 307-325.

Wasserman, N. (2006). Stewards, agents, and the founder discount: Executive compensation in new ventures. *Academy of Management Journal, 49*(5), 960-976.

Waters, D. (2011). *Supply chain risk management: Vulnerability and resilience in logistics* (2nd ed.). India: Kogan Page Limited.

Weber, E. U. (2010). Risk attitude and preference. *Wiley Interdisciplinary Reviews: Cognitive Science, 1*(1), 79-88.

Weber, E. U., Blais, A., & Betz, N. E. (2002). A domain-specific risk-attitude scale: Measuring risk perceptions and risk behaviors. *Journal of Behavioral Decision Making, 15*(4), 263-290.

West, D. C., & Sargeant, A. (2004). Taking risks with advertising: The case of the not-for-profit sector. *Journal of Marketing Management, 20*(9-10), 1027-1045.

Yates, J. F. (1992). *Risk-taking behavior.* West Sussex, England: John Wiley & Sons.

Yates, J. F., & Stone, E. R. (1992). The risk construct. In J. F. Yates (Ed.), *Risk-taking behavior* (pp. 1-25). New York, NY: John Wiley & Sons.

Yu, J., & Cooper, H. (1983). A quantitative review of research design effects on response rates to questionnaires. *Journal of Marketing Research, 20*(1), 36-44.

Zhu, R., Dholakia, U. M., Chen, X., & Algesheimer, R. (2012). Does online community participation foster risky financial behavior? *Journal of Marketing Research, 49*(3), 394-407.

Zsidisin, G. A., Ragatz, G. L., & Melnyk, S. A. (2005). The dark side of supply chain management. *Supply Chain Management Review, 9*(2), 46-52.

Zuckerman, M. (1979). Sensation seeking: Beyond the optimal level of arousal (Hillsdale, NJ: Erlbaum).