2017

Jet Fuel Hedging and Modern Financial Theory in the U.S. Airline Industry

Brandon Lee Schweitzer
Walden University

Walden University

College of Management and Technology

This is to certify that the doctoral dissertation by

Brandon Schweitzer

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Robert Levasseur, Committee Chairperson, Management Faculty
Dr. Anthony Lolas, Committee Member, Management Faculty
Dr. Craig Barton, University Reviewer, Management Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2017

Abstract

Jet Fuel Hedging and Modern Financial Theory in the U.S. Airline Industry

by

Brandon Lee Schweitzer

MBA, Hawaii Pacific University, 2009

BS, Hawaii Pacific University, 2008

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Management

Walden University

February 2017

Abstract

To counter the problem of the volatility of jet fuel prices within the United States, many financial managers of U.S. airlines use hedging as a financial tool to mitigate the risk of exposure to market price volatility. However, their efforts often lead to financial distress for their airlines. The purpose of this qualitative grounded theory study was to explore U.S. airline managers' use of financial hedging to reduce the risk of exposure from the volatility of jet fuel prices. The conceptual framework was Simkowitz's theory of modern finance, which concerns debt policy, dividend policy, and investment policy as they relate to financial decision making by upper management. The research questions addressed when, why, and how U.S. airline financial managers would consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at times of lower jet fuel prices. Interviews with a purposive sample of 20 U.S. airline financial managers provided data for analysis and theory development of jet fuel hedging utilization in the U.S. airline industry. Data analysis using the constant comparative method enabled the development of a theory of jet fuel hedging utilization. Participants reported using over-the-counter derivatives purchasing strategies as a form of hedging to protect their airlines against spikes in jet fuel prices on the open market. Using study findings, managers may be able to reduce jet fuel operating costs in the U.S. airline industry. Implications for positive social change include potentially higher profits and more jobs as well as lower consumer prices.

Jet Fuel Hedging and Modern Financial Theory in the U.S. Airline Industry

by

Brandon Lee Schweitzer

MBA, Hawaii Pacific University, 2009

BS, Hawaii Pacific University, 2008

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Management

Walden University

February 2017

Dedication

This dissertation is dedicated to my loving family who have continued to support me in every decision I have made in my educational journey. To my wife, Katherine Coniff, who has loved me and supported me during the long nights of reading and writing, thank you. Thank you to my parents, Randy and Donna Schweitzer, who have encouraged me to complete my undergraduate, masters, and doctoral programs. Without you, I would not have found the courage to continue my educational journey.

I would also like to dedicate this dissertation to the faculty and staff at Hawaii Pacific University in Honolulu, Hawaii, who have encouraged me to continue my educational growth and to become a leader in the industry. Without their knowledge and experience, I would not have been capable of pursuing the doctoral degree at Walden University.

Acknowledgments

I would like to acknowledge and thank Dr. Robert Levasseur for his continued support and dedication in mentoring me to complete this dissertation. He has worked tirelessly in his efforts to guide me toward completion of the PhD program. I would also like to thank my committee member, Dr. Anthony Lolas, and my University Research Reviewer, Dr. Craig Barton, who provided me with guidance in the content area of this dissertation by sharing their expertise in the field. If it were not for Drs. Levasseur, Lolas, and Barton and their continued encouragement, I would not be where I am today.

I would also like to take this time to thank the faculty and staff at Walden University for all their continued support in my efforts to complete the PhD program. They have made my experience at Walden University enjoyable and inspirational as they have continued to provide me with the resources and knowledge to continue my educational journey.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

The cost of jet fuel is the largest expense of any airline operation (Armen, 2013). Faced with high fuel costs, many airlines struggle to maintain positive cash flows (Armen, 2013). Jet fuel prices have been significantly high over the past few years in comparison to the last quarter of 2014 and the first quarter of 2015 (Dunnn & Russell, 2015). Over the past several years, jet fuel prices have been volatile and have risen and decreased with changes in market prices (United States Energy Information Administration, 2015). Airlines have engaged in the practice of hedging jet fuel prices to gain a competitive advantage and reduce the risk of volatile prices (Carter et al., 2006). U.S. airline financial managers use hedging to purchase jet fuel on a contract between the airline company and the jet fuel supplier for a specific price, quantity, and length of time (Morrell & Swan, 2006).

Several researchers have conducted quantitative studies of U.S. airline financial managers use of hedging as a financial tool to mitigate the risk of jet fuel price volatility (see Adrangi, Gritta, & Raffiee, 2014; Armen, 2013; Aïd, Campi, & Langrené, 2013; Borenstein, 2011; Campello, Lin, Ma, & Zou, 2011; Dunham, 2012; Gerner & Ronn, 2013; Huang & Zhang, 2015; Mantin & Edward Wang, 2012; Morrell & Swan, 2006; Ngai & Dastin, 2014; Power, Vedenov, Anderson, & Klose, 2013; Treanor, Simkins, & Rogers, 2014; Turner, 2014). However, based on a significant review of the literature, researchers have not conducted qualitative studies of the practice. To better understand when, why, and how U.S. airline financial managers might use hedging as a financial tool

to mitigate jet fuel price risk at a time of lower jet fuel prices, this study included the use of a qualitative grounded theory approach.

Study findings may provide U.S. airline financial managers with knowledge about more efficient methods of controlling prices paid for jet fuel. If airline financial managers can save significant amounts of expenses derived from the price of jet fuel, they might be better able to create jobs and lower consumer airfare prices (Treanor et al., 2014). Other direct and indirect economic improvements may result from the purchase of new aircraft, taxes collected that contribute to local economies, and infrastructure investments such as airport and roadway improvements.

This chapter includes background information on jet fuel hedging in the U.S. airline industry. In this chapter, there is an overview of scholarly research on the topic presented. This chapter includes a discussion of the specific problem of the need for airline financial managers to better understand the use of hedging as a financial tool to mitigate risk in the purchase of jet fuel. This chapter also includes a presentation on the modern financial theoretical framework utilized to guide this investigation. Also discussed are the nature of the study, assumptions, scope, limitations, and significance of the study.

Background of the Study

The practice of hedging allows for airline companies to mitigate market volatility in jet fuel prices. Because jet fuel is the highest expense of any airline (Berghöfer & Lucey, 2014), airline financial managers need to make informed decisions about how to purchase jet fuel (Carter et al., 2006). Treanor et al. (2014) explained the concepts of

hedging practices and possible applications within the U.S. airline industry in a quantitative study.

Adrangi, Gritta, and Raffiee (2014) addressed the interdependence of jet fuel prices and airline passenger profits. Airline financial managers should understand the interdependence of jet fuel prices and airline passenger profits because the practice of hedging requires significant positive cash flows (Adrangi et al., 2014). Armen (2013) analyzed the relationship between liquidity ratios and U.S. airline performance. Because the aviation industry is cash driven (e.g., the purchases of commodities such as jet fuel are based on cash), airline financial managers should understand the importance of cash flows and airline financial performance.

Gerner and Ronn (2013) provided a list of airlines that use hedging to mitigate the jet fuel price volatility in the purchase of jet fuel. Not all airlines engage in the practice of hedging jet fuel pricing because not all airlines have the same capability to do so. Airline financial managers should ensure their company has significant cash reserves and optimization of airline operations to engage productively in hedging practices. Gerner and Ronn (2013) identified which U.S. airlines have this capability and which airlines could have it by enacting changes to their operations.

The United States Energy Information Administration (2015) and the United States Department of Transportation (2015) both provide public statistical information on jet fuel pricing and U.S. airline profits for further analysis. The United States Energy Information Administration (2015) maintains current and historical information on jet fuel pricing and different pricing models such as spot prices, futures prices, and

wholesale prices. There is a possibility for U.S. airline financial managers to gather and analyze this information in a way that may change their strategy for purchasing jet fuel. The United States Department of Transportation (2015) maintains financial and operational data for all airlines that operate within the United States. This information provides U.S. airline financial managers and other interested individuals with an understanding of the financial and operation performance of each air carrier.

Airlines for America (2015) and Reuters (Ngai & Dastin, 2014) analyzed the impact of price fluctuations in jet fuel on travelers. Adrangi et al. (2014) noted that the fluctuation of jet fuel prices often has an impact on airline ticket prices for travelers. When U.S. airline financial managers engage in the use of hedging, ticket prices for travelers change based on the contract purchase price of jet fuel. Ticket prices may even increase at times of falling jet fuel prices because of hedging practices (Ngai & Dastin, 2014). This phenomenon occurs when U.S. airline financial managers use hedging and the market purchase price of jet fuel falls below the contract purchase price.

Most previous researchers studying jet fuel price hedging in the U.S. airline industry have used a quantitative perspective (see Gerner & Ronn, 2013). Researchers have conceptualized jet fuel hedging (see Treanor et al., 2013). They have also sought to develop an appropriate financial tool for quantitative analysis of hedging strategies (see Turner, 2014). This study included an exploration of the use of hedging as a financial tool from a qualitative perspective, focusing on when, why, and how airline financial managers decide to use the practice. Information gathered from airline financial managers' decision-making processes provided additional insight into the use of hedging.

This qualitative grounded theory study may provide U.S. airline financial managers with further insight on why hedging may be a viable option for the purchase of jet fuel. Implications for positive social change include the creation of new airline job opportunities and positive direct and indirect effects on the U.S. economy because of U.S. airline companies' lower jet fuel expenses. Direct effects on the U.S. economy include additional tax revenue from additional U.S. airline profits. Indirect effects on the U.S. economy include U.S. airline financial managers spending funds saved through lower jet fuel expenses on additional services such as improved airport infrastructure.

Problem Statement

Before the last quarter of 2014, crude oil and refined energies were very high in price at both the commodity and consumer price levels (Helleloid, Seong-Hyun, Schultz, & Vitton, 2015). In the last few months of 2014, the prices of crude oil and refined energies decreased significantly within the United States (Ngai & Dastin, 2014). This fall in the prices for energies during 2015-2016 translated into reduced prices at gas pumps for consumers and reduced jet fuel market prices for airlines (Ngai & Dastin, 2014). The general problem is that, in spite of these significant price declines, the cost of U.S. airline tickets has remained constant or, in some cases, has even risen (United States Department of Transportation, 2015). Per the United States Energy Information Administration (2015), airline financial managers' purchase of jet fuel futures when fuel prices were significantly higher contributed to this phenomenon.

Airlines that did not participate in jet fuel hedging in 2014 had a significant increase in profits (Martin, 2015). Airlines that took part in jet fuel hedging just before

the decline in prices experienced significant losses (Martin, 2015). These losses occurred because of the agreement and payment of contract prices over a period of time that were far above the market prices for the last quarter of 2014 (Martin, 2015). The specific problem is that airline managerial decision makers need to explore available financial tools, including hedging specifically, to determine the best approach for minimizing risk related to the volatility of jet fuel prices (Treanor et al., 2014).

Researchers previously published peer-reviewed journal articles on jet fuel hedging within the U.S. airline industry, in which researchers have analyzed price risk, effectiveness, financial optimization, and airline operations (see Treanor et al., 2013). However, researchers have called for further quantitative and qualitative research on the topic of hedging jet fuel prices within the U.S. airline industry (Treanor et al., 2014).

Purpose of the Study

To counter the volatility of jet fuel prices within the United States, many U.S. airlines need to use an array of financial tools, such as hedging, to stabilize and minimize the risk of exposure to this volatility (Treanor et al., 2014). The fluctuating cost of jet fuel over the past several years resulted in significant pressure on airlines to maintain positive cash flows (Armen, 2013). Hedging the expense of jet fuel is possible; however, there is no optimum hedging option available. Some airlines use hedging with derivatives (Aïd et al., 2013). However, most airlines use unhedged options, collar structures, and swaps as part of their desired financial strategy (Gerner & Ronn, 2013). The purpose of this study was to explore the use of jet fuel hedging as a financial tool for airline financial managers

within the U.S. airline industry as a viable option to reduce the risk of exposure from the volatility of jet fuel prices at times of lower jet fuel prices.

Research Questions

General research question: When, why, and how would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices?

Sub research questions:

RQ1. When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel?

RQ2. Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

RQ3. How could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

Conceptual Framework

The conceptual foundation for this qualitative grounded theory study was Simkowitz's (1972) theory of modern finance. In formulating this theory, Simkowitz addressed debt policy, dividend policy, and investment policy as they relate to financial decision-making practices by upper management. Simkowitz provided researchers with significant insight regarding debts, dividends, and investments made by managers in many business organizations (Simkowitz, 1972). In the debt policy from this theoretical perspective, Simkowitz detailed the consideration of market conditions such as

transaction costs, barriers to entry, and influence from buyers and sellers on the price of commodities.

In the current U.S. airline industry environment, the cost of purchasing jet fuel, restrictions on commodities, and the influence from other airline carriers on current jet fuel prices are related to market conditions (Treanor et al., 2014). The dividend policy of modern financial theory includes the cash position of organizations. In the case of the U.S. airline industry, top management must ensure that large cash reserves are available for commencing jet fuel hedging practices (Simkowitz, 1972). Simkowitz's (1972) investment policy of modern financial theory assumes the existence of similar return classes where, regardless of economic factors, interest rates, demand, income distribution, or other factors, the relationship between two or more companies in the same class will remain relatively the same (Simkowitz, 1972). Simkowitz's (1972) investment policy applies to the practice of purchasing jet fuel regardless of these conditions within the U.S. airline industry. Simkowitz's (1972) theory of modern finance was the most applicable conceptual foundation for this qualitative grounded theory study.

Nature of the Study

When, why, and how U.S. airline managers use hedging as a financial tool to mitigate market risk in the purchase of jet fuel was the focus of this grounded theory study. Grounded theory was the most viable design option because it allowed for the use of a constructivist point of view. Using a constructivist perspective, a researcher develops concepts and theories based on insights gleaned from participants' insights about their lived experiences (Corbin & Strauss, 2015). Other research designs considered for this

study were a case study and phenomenological. Focusing on specific U.S. airline companies using a case study design would not have been appropriate because focusing on one specific airline company (or, a few companies) did not align with the research questions, which focus on the investigation of a phenomenon across organizational boundaries.

A phenomenological design would not have been appropriate because the use of hedging as a financial tool followed trends within the U.S. airline industry and the results from the use of hedging varied for each air carrier. A grounded theory research approach was the best selection because grounded theory allows for research questions to be aligned and enables the development of new theories. The target population for this qualitative grounded theory study was U.S. airline financial managers.

This study included 20 research participants who hold or have held active roles in the U.S. airline industry as managers in finance recruited from 20 primary airlines, including sub-operator airlines that have daily passenger flights in the United States. These participants answered interview questions about when, why, and how airline financial managers use hedging as a financial tool to mitigate jet fuel price risk. This study included the collection of secondary data to demonstrate findings of data collected from interview participants. This secondary data are archival data from the U.S. Department of Transportation statistical database, U.S. Department of Energy database, U.S. Securities and Exchange Commission K-10 Reports, U.S. airlines corporate websites, and scholarly journals.

The basis for selecting the sample of study participants was their managerial finance role within U.S. airline companies. In addition to interviews, which was the primary means of collecting participant input data, there were multiple sources of secondary data. These secondary data sources included the U.S. Department of Transportation statistical database, U.S. Department of Energy database, U.S. Securities and Exchange Commission K-10 Reports, U.S. airlines corporate websites, and scholarly journals to enhance the validity and reliability of the study. Nvivo (2016) coding software facilitated the organization of data collected through interviews of participants in financial positions within the U.S. airline industry. As the researcher in this study, my role was to act as the instrument for data collection and analysis. Measures to protect the rights of study participants included the use of consent forms, upfront representation of the nature of the interviews, and training received from the National Institutes of Health in the protection of human research participants.

Definitions

This section defines the terminology that is unique to the financial and airline industries that are not commonly known.

Collar: A protective options strategy implemented after a long position in stock experiences substantial gains (Investopedia, 2015).

Commodity: Any good exchanged during commerce, which includes goods traded on a commodity exchange (Investopedia, 2015).

Crude Oil: A naturally occurring, unrefined petroleum product composed of hydrocarbon deposits (Investopedia, 2015).

Futures: A financial contract obligating the buyer to purchase an asset (or the seller to sell an asset), such as a physical commodity or a financial instrument, at a predetermined future date and price (Investopedia, 2015).

Futures Contract: A contractual agreement, generally made on the trading floor of a futures exchange, to buy or sell a commodity or financial instrument at a pre-determined price in the future (Investopedia, 2015).

Hedge: Making an investment to reduce the risk of adverse price movements in an asset (Investopedia, 2015).

Hedging: A strategy that helps an investor reduce, the risk he or she takes on investment (Investopedia, 2015).

Market Price: The Unique price at which buyers and sellers agree to trade in an open market at a time (WebFinance, Inc., 2015).

Option: A financial derivative that represents a contract sold by one party (option writer) to another party (option holder) (Investopedia, 2015).

Price Risk: The risk of a decline in the value of a security or a portfolio (Investopedia, 2015).

Risk Mitigation: The process by which an organization introduces specific measures to minimize or eliminate unacceptable risks associated with its operations (WebFinance, Inc., 2015).

Swap: Traditionally, the exchange of one security for another to change the maturity (bonds), quality of issues (stocks or bonds), or because investment objectives have changed (Investopedia, 2015).

Volatility: A variable in option pricing formulas showing the extent to which the return of the underlying asset will fluctuate between now and the option's expiration (Investopedia, 2015).

Assumptions

The first assumption is that all participants answered questions truthfully. The participants answered questions truthfully is an assumption because without truthfully answered questions, no data would be valid and reliable. Another assumption is the relationship between the price of jet fuel and the market price with no other influences that create volatility in jet fuel prices. This assumption is important to the study because of the volumes of jet fuel traded on the open market. Because jet fuel is on the commodities market in most market exchanges, the commodity becomes volatile based on the volumes traded on the free market. It is important to understand how jet fuel becomes volatile to comprehend why it is important for U.S. airline financial managers to explore financial tools such as hedging to mitigate the risk of jet fuel price volatility.

Another key assumption is that data within United States Department of Transportation and the United States Securities Exchange Commission government databases is complete and accurate. Completeness and accuracy in these databases are critical to the triangulation of data in this study.

Scope and Delimitations

Scope of the Study

The scope of this study was to research jet fuel hedging as a financial tool for U.S. airline financial managers to utilize to mitigate the risk of jet fuel price volatility. More

specifically, the use of hedging as a financial instrument in the purchasing of jet fuel contract futures at a time of lower jet fuel prices and the need for airline financial managers to consider the use of hedging as a financial tool are the focus of the study. The findings from this study filled the gap in the existing body of knowledge in this area.

Delimitations

The primary delimitation of this study was the exclusive focus on financial tools for U.S. airline managers to utilize to mitigate the risk of jet fuel price volatility. The financial tools explored were hedging and hedging related tools. Thus, participants in this study came from the target population of U.S. executives and managers, directly and indirectly, involved in the use or potential use of hedging as a financial tool.

This research study was not about the financial returns or financial specifics from the use of hedging as a financial tool. The focus of this study was specifically about when, why, and how U.S. airline financial managers would decide to use hedging as a financial tool to mitigate the risk of jet fuel prices. Identifying the financial returns to U.S. airline companies from the use of hedging is a topic for future research.

Limitations

Limitations of the research design and methodology limited the data yielded from government databases and participants. Hedging only works with futures contracts because the purpose of hedging tool is to mitigate the risk of fluctuating jet fuel prices. Hence, the financial information and jet fuel pricing data used in the study included only futures contracts because the study primarily involves the use and practice of hedging as a financial tool.

There are currently 30 primary airlines, including sub-operators that have daily passenger flights in the United States. The study included 20 financial managers within these airlines. Originally, there were not be enough respondents from these airlines, as mentioned in the limitations section. Since there were not enough respondents from primary airlines, the study included sub-operator airlines.

The number of respondents became a limitation based on the number of current operating airlines in the United States. There are approximately 30 major airlines currently operating in the United States. Invitations for participation in this study went out to 200 potential participants through email across the 30 major airlines. Of the 200 potential research participants contacted, 26 potential research participants responded. Of the 26 respondents, 20 participants were willing and able to answer interview questions. Interviews with 20 participants were necessary to reach data saturation, which is the point at which no new patterns or trends emerge from the collected data (Corbin & Strauss, 2015), the number of major U.S. airlines became a limitation. To address the limitation of the number of respondents, interviews with managers in sub-operator airlines in the United States that do not have daily passenger flights completed the sample. The number of U.S airlines in the target population increased from approximately 30 to approximately 50 airlines with this change.

Significance of the Study

Significance to Practice

This study expanded the boundaries of the existing body of knowledge on the use of hedging as a financial tool to mitigate the risk of jet fuel prices within the U.S. airline

industry through the contribution of managerial decision-making perspectives. With the contribution of this study, U.S. airline financial managers will be able to make more informed decisions on when, why, and how to use hedging as a financial tool to mitigate the risk of jet fuel prices. U.S. airline managers may use this information to assist in the reduction of jet fuel purchase expenses, increase in airline profits, and improve airline performance.

The U.S. airline industry may benefit from this study because the knowledge gained from this study could impact how airline managers endeavor to mitigate the risk of jet fuel prices. With the sharing of information learned in this study, U.S. airline managers could gain insight from how managers think about the use of hedging as a financial tool. The contributions to the U.S. airline industry from this study can impact the sector positively worldwide. With a potential for savings on the cost of jet fuel using hedging as a financial tool, there is a possibility for airlines to contribute to positive social change with the hiring of new employees, more tax contributions, and additional contributions to local economies.

Significance to Theory

Simkowitz's (1972) theory of modern finance addressed debt policy, dividend policy, and investment policy as they relate to financial decision-making practices by upper management. These policies as they correlate to financial hedging could have a significant impact on how managerial decision makers decide on the use of hedging as a financial tool. The debt policy of modern financial theory addressed in this study includes the examination of hedging as a financial tool to leverage the U.S. airline company using

hedging into a position where financing debt mitigates the purchase jet fuel. Dividend policy of modern financial theory addressed dividends impacted based on the use of financial tools to mitigate the risk of jet fuel prices. The potential savings or additional expense from jet fuel purchases could ultimately affect dividends paid to investors. The investment policy of modern financial theory could be greatly affected by this study where the future investment of jet fuel as an asset could be affected by the mitigation of price risk.

This research could provide airline executives with a link between modern financial theory to hedged and unhedged jet fuel options in the U.S. airline industry. The theoretical basis of this study is Simkowitz's (1972) theory of modern finance. Contributions of hedging as a tool for financial managers in the U.S. airline industry could advance the knowledge base of how airline managers can reduce the risk of jet fuel price volatility.

Significance to Social Change

Managing social risks and impacts through risk management in jet fuel volatility, a higher level of financial stability and further economic growth can emerge, creating new employment opportunities. These factors contribute to positive social change. The airline industry in the United States is responsible for generating 11 million direct and indirect American jobs (Airlines for America, 2016). These jobs drive positive social change in the economy because the wages from these jobs have a positive impact on employees and their families.

The airline industry is also contributing to local economies through direct and indirect commerce, taxes, infrastructure investments, and jobs (Airlines for America, 2016). Contributions to local economies have positive social change impacts because of the local commerce, tax profits, infrastructure investments, and jobs benefits generated in the local economies. In addition to these benefits, the U.S. airline industry is also responsible for generating nearly 5 percent of the U.S. gross domestic product (Airlines for America, 2016). This investment has positive social change implications because increases in the gross domestic product added to the national economy, more job creation is possible. This study will contribute to these positive social change elements through the reduction of jet fuel operating costs in the U.S. airline industry which will mean stronger profits and more jobs.

Summary and Transition

This chapter introduced the purpose and problem statement of this study. In this chapter, the presentation of research questions was before the theoretical framework grounding this study. This qualitative study involved an examination of the use of financial hedging as a means of hedging jet fuel prices based on the perceptions of a sample of U.S. airline financial managers. This chapter included definitions and assumptions to explain the research design. Also, included in this chapter were the scope and limitations of the study. Finally, this chapter included the significance of the research design on why a study is necessary on jet fuel hedging and the positive social change impacts the study may have.

Chapter 2 will include a critical review of the grounding literature for this study and a discussion of why it is important to examine this literature. The key items discussed in the literature review are the theoretical framework, the basis for hedging jet fuel, and the need for airline financial managers to make decisions based on jet fuel hedging.

Chapter 2: Literature Review

The specific problem driving this study was that airline managerial decision makers need to explore available financial tools, including hedging specifically, to determine the best approach for minimizing risk related to the volatility of jet fuel prices (Treanor et al., 2014). The purpose of this study was to explore the use of hedging for U.S. airline financial managers as a viable option to reduce the risk of exposure from the volatility of jet fuel prices.

This chapter includes the literature search strategy utilized to locate and identify key research. The chapter also contains the conceptual framework of the study and a full literature review of studies relate to key concepts and phenomena to discover what was known and unknown of the use of hedging. Also, included in this chapter is a summary of the literature review and conclusions.

Literature Search Strategy

The literature search strategy involved the use of three major library databases: (a) ProQuest's dissertations and business and management databases, (b) EBSCO Host's Thoreau database, and (c) Elsevier's ScienceDirect database. The primary search terms and combinations were

- *hedging*,
- *jet fuel hedging*,
- *airline hedging*,
- *energy futures*,
- *risk management*,

- *option pricing*,
- *U.S. airline companies*,
- *U.S. airline industry*,
- *U.S. airline systems*,
- *jet fuel management*,
- *jet fuel consumption*,
- *modern financial theory*,
- *modern portfolio theory*, and
- *finance theory*.

The literature search involved an examination of materials from 1972-2016, with most of the literature published within 5 years of the study. These literature materials included peer-reviewed journals, dissertations, and books. There were no recently published qualitative dissertations or conference proceedings on the topic of jet fuel hedging. Due to the lack of qualitative research on this topic, there was a need to include several quantitative dissertations about jet fuel hedging.

Selection Process of Literature for the Conceptual Framework

Several theories that apply to examining the use of hedging to mitigate the risk of jet fuel price volatility exist. Related theories in corporate finance and financial hedging include Markowitz's (1991) modern portfolio theory. This theory originated because there was a need for further understanding or risk mitigation within investor portfolios (Markowitz, 1991). The modern portfolio theory is the conceptual framework for this study because this conceptual framework explains the concept of variance in return or

risk (Markowitz, 1991). In this conceptual framework, Markowitz identified how to mitigate the difference in performance through diversification of investor's portfolios (Markowitz, 1991). The difference in performance management is that methods exist for the purpose of improving profitability by reducing the risk of volatility in asset returns (Markowitz, 1991).

The behavioral finance theories in this study demonstrate the decision-making process of executives. Another behavioral finance theory, the theory of games, was another possible theoretical foundation for this study. Morgenstern and Neumann's (1944) addressed questions about decision-making models through the theory of games. More commonly known as game theory, the theory is a mathematical model for decision-making, which allows researchers to explore the complexities of conflict and cooperation between decision-makers in depth (Morgenstern & Neumann, 1976). Consideration was given to game theory as a possible conceptual framework because it applies to U.S. airline financial managers and their decision-making model.

The conceptual framework selected for this study was modern financial theory. As developed by theorist Simkowitz (1972), modern financial theory is a behavioral finance theory in which risk is a core component of financial decision making. Concepts of modern financial theory originated from the theory of finance in which a perfect capital market analysis with uncertain returns for investor decisions exists, except for circumstances of risk (Econometric Society, 1971). Use of the modern financial theory makes the analysis of strategy options more orderly (Simkowitz, 1972). The modern

financial theory is the theoretical foundation for this study because of its alignment to the research questions.

Selected Conceptual Framework

The conceptual framework selected for this study, Simkowitz's (1972) modern financial theory, most closely aligns with this study because of the relationships between debt policy, dividend policy, and investment policy and financial decision makers within an organization. The debt policy, dividend policy, and investment policy of a U.S. airline company have an impact on the decisions made by financial managers for the purchase of jet fuel (Simkowitz, 1972).

Origins of Modern Financial Theory

Simkowitz (1972) developed modern financial theory to recognize extraordinary opportunities in the marketplace as exploitations of market imperfections. Simkowitz identified concepts of debt policy, dividend policy, and investment policy as they relate to financial decision-making practices by upper management in modern financial theory. Concepts of debt policy, dividend policy, and investment policy relate to how U.S. airline financial managers make decisions on the use of hedging (Treanor et al., 2014).

Application of Modern Financial Theory

Simkowitz (1972) developed modern financial theory over the past few decades. The financial tool of hedging is a financial strategy to mitigate risk in an investment. The debt policy, dividend policy, and investment policy within modern financial theory have general application to all organizations (Simkowitz, 1972). Specifically, the modern

financial theory has an application to the decision process to use a financial tool such as hedging.

The definition of debt policy within modern financial theory is loans made by contractual arrangement and investments that make the stockholder an extra benefit (Simkowitz, 1972). The timing of loans and investments are tactical decisions rather than strategic decisions, and are commonly short-term (Simkowitz, 1972). These short-term investments apply to the purchase of jet fuel.

The definition of dividend policy within modern financial theory is the decision of how much money capital stockholders receive during a specified amount of time (Simkowitz, 1972). Dividend strategies range from no payouts to all earnings payouts depending on the organization's dividend policy (Simkowitz, 1972). The impact on payouts stems from the bottom-line earnings of the airline.

Simkowitz (1972) defined investment policy within modern financial theory as organizations investing funds provided to the organization from bondholders and stockholders (Simkowitz, 1972). The asset that a company holds is the investment policy within an organization (Simkowitz, 1972). Certain organizations realize certain investments are more attractive than other investments (Simkowitz, 1972).

Rationale for the Selection of Modern Financial Theory

The rationale for the selection of modern financial theory for this study is because of Simkowitz's (1972) explanation of debt policy, dividend policy, and investment policy for the use of decision makers. Debt policy decisions are commonly made for the primary benefit of the organization with residual benefit to the lender or stockholder (Simkowitz,

1972). The application of debt policy within modern financial theory to U.S. airline financial decision makers is significant for the purchase of jet fuel.

Dividend policy decisions relate to the bottom-line profits an organization earns in a specific amount of time (Simkowitz, 1972). Dividend policy within modern financial theory has applicability to U.S. airline financial decision makers in the distribution of profits to stockholders. Investment policy decisions relate to the asset investments that would most benefit the organization (Simkowitz, 1972). The investment policy within modern financial theory has applicability to U.S. airline financial decision makers based on the need to invest in assets such as jet fuel.

Modern Financial Theory in this Study

The first sub-research question of this study is: When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel? Identifying when a financial manager would consider the use of hedging involves the examination of the airline company's investment policy, debt policy, and may also take into consideration the airline company's dividend policy. Purchasing jet fuel using hedging will have a direct impact on the company's investment policy and debt policy. This impact is imminent because the purchase of jet fuel is a purchase of an asset for an airline company. The acquisition of jet fuel is an investment in an asset that will impact the company's investment policy. Purchasing jet fuel also has a direct bearing on the airline company's debt policy; whereas, the purchase of jet fuel through hedging strategies is the same as purchasing jet fuel in futures, which is a

liability. Simkowitz (1972) earlier showed that liabilities relate directly to an organization's debt policy.

The second sub-research question of this study is: Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel? This research question relates to the investment policy, debt policy, and dividend policy of U.S. airline companies. When a financial manager decides to use hedging in the purchase of jet fuel, the decision impacts the investment policy. When a decision is made to buy jet fuel on a futures contract, the decision impacts the debt policy. When the time comes for the airline companies to pay out dividends to shareholders through cost savings in jet fuel, the decision impacts the dividend policy.

The third sub-research question of this study is: How would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel? Investment policy has the greatest impact on this research question. Jet fuel purchased using hedging will have a bearing on the airline company's investment policy. This research question also affects debt policy because airline companies purchase jet fuel on credit. There is also an impact on dividend policy where the cost savings in jet fuel impacts the decision on how much profit goes through the distribution of dividends.

Literature Review

Studies Related to Constructs of Interest and Selected Methodology

This research expands on research from Adrangi, Gritta, and Raffiee (2014), Armen (2013), Gerner and Ronn (2013), Martin (2015), and Treanor et al. (2014). Adrangi et al. (2014) discussed a significant relationship between the volatility of jet fuel

prices and U.S. airline company profits. Rises in jet fuel prices coincide with decreases in U.S. airline company profits. Conversely, decreases in jet fuel prices coincide with increases in U.S. airline company profits. “Airlines in common with other industry operators hedge to protect fuel costs. Hedging broadly means locking in the cost of future fuel purchases, which protects against sudden cost increases from rising fuel prices, but it also prevents savings from decreasing fuel prices” (Morrell & Swan, 2006, p. 714). Adrangi et al. (2014) agreed with Morrell and Swan (2006) on the relationship between the use of hedging and fluctuating fuel prices.

Armen (2013) discussed the relationship between increasing jet fuel prices, economic conditions, and the demand for passenger air travel. From 2007 to 2011, the U.S. economy suffered a great decline, and the cost of jet fuel increased (Armen, 2013). These factors resulted in cash flow and profit decreases for U.S. airline companies (Armen, 2013). Armen (2013) and Zarb (2014) agreed that cash flows are important to consider when an airline is considering the purchase of jet fuel. The cash flow performance is indicative of a company’s purchasing power and the company’s ability to repay debt (Armen, 2013). Anderson and Lillis (2011) agreed with Armen (2013) and Zarb (2014) that having enough cash on hand improves a company’s purchasing power and ability to repay existing obligations. Through the examination of 10-K reports and other United States Securities Exchange Commission filings, potential investors and researchers can quickly and easily identify the current cash flow situation of an airline (Anderson & Lillis, 2011). To understand the potential for hedging jet fuel, airline financial managers examine the liquidity position of an airline (Gerner & Ronn, 2013).

Gerner and Ronn (2013) discussed the current uses of hedging strategies within the U.S. airline industry in response to the rising jet fuel prices. The volatility of jet fuel prices on the open market has an impact on the U.S. airline companies' ability to maximize profits. The fluctuation of crude oil and heating oil prices relate to the volatility of jet fuel prices because jet fuel is not a traded commodity and because jet fuel prices relate to crude oil and heating oil prices on the open market (Gerner & Ronn, 2013). For this reason, U.S. airlines commonly use over the counter derivatives to base the price of jet fuel in a contract (Gerner & Ronn, 2013). The most commonly used over the counter derivative is the average cost of delivery for the period of one month (Gerner & Ronn, 2013). Brooks (2012), Simmons (2015), and Morrell and Swan (2006) agreed with Gerner and Ronn (2013) that airline companies use over the counter derivatives to base the price of jet fuel in a hedging contract.

Martin (2015) discussed how American Airlines, the world's largest airline company at the time did not use hedging as a financial tool to mitigate risk in the volatility of jet fuel prices when purchasing jet fuel. For the fiscal year of 2014, the airline reported an 115% increase in net income resulted in part from savings in fuel costs through not hedging (Martin, 2015). The other main U.S. airline companies reported stronger earnings because of lower fuel costs; however, the savings were not as strong as American Airlines because the other major carriers hedged the cost of their jet fuel (Martin, 2015). When an airline uses hedging, the airline enters contract pricing for jet fuel purchases (Martin, 2015). Contract purchasing, or hedging, guarantees that an airline

will buy a specified amount of fuel for a specified price regardless of the fluctuation in jet fuel prices on the open market (Gerner & Ronn, 2013; Treanor et al., 2014).

Treanor et al. (2014) agreed with Aïd, Campi, and Langrené (2013) and with Carter, Rogers, and Simkins (2006) on strategies commonly used within the U.S. airline industry for companies to reduce jet fuel price risk through the use of operational and financial hedging strategies. Operational hedging strategies are inclusive of airline fleet composition and the use of aging aircraft (Treanor et al., 2014). Airline fleet composition is the types of aircraft that an airline uses to diversify the airline's fleet of aircraft (Treanor et al., 2014). Having a diversified fleet of aircraft is a strategy that airline companies use to diversify exposure to jet fuel prices and other expenses such as maintenance (Treanor et al., 2014). Different size aircraft within a fleet can result in fuel consumption savings at a time of higher jet fuel prices (Treanor et al., 2014). Kuancheng and Ko-Chen (Kuancheng & Ko-Chen, 2011) agree with Treanor et al. (2014) that the different aircraft configurations is a method of diversifying risk and exposure. Airline companies commonly use smaller aircraft at times of higher jet fuel prices to diversify the exposure to jet fuel prices (Treanor et al., 2014).

Treanor et al. (2014) argued that operational hedging has a more meaningful impact on the reduction in jet fuel price exposure than financial hedging. Operational hedging in the airline industry is the diversification in the aircraft fleet to control fuel efficiency (Treanor et al. 2014). Airlines use hedging strategies to manage the risk, and the potential for risk, within volatile industries and commodities such as jet fuel (Power, et al., 2013). Financial hedging is inclusive of using hedging as a financial tool to

mitigate risk in the exposure of jet fuel price volatility. Using financial hedging allows for airline companies to purchase jet fuel at a specific price, a specific amount of time, and specific quantity (Treanor et al., 2014).

Purchasing contracts within the U.S. airline industry entails the purchase of jet fuel at a specific price, the amount of time, and quantity (Morrell & Swan, 2006). The primary benefit to purchasing jet fuel for a specific price is a guarantee that even if the price of fuel increases, the specific price paid in the contact will not increase (Treanor et al., 2014). However, the opposite is also true where in the event the price of jet fuel decreases, the airline company, per the contract, must continue paying for jet fuel at the contract rate and will end up paying more than the market rate (Morrell & Swan, 2006). Purchasing jet fuel over a specific amount of time within a contract benefits the airline company regarding higher jet fuel prices and may hinder the airline company in the event of a decline in jet fuel market prices during this specified amount of time (Morrell & Swan, 2006). Purchasing jet fuel within a specified quantity may have an adverse impact on cash flows for an airline company (Treanor et al., 2014).

Methods Consistent with the Scope of the Study

The scope of this study was to research the financial hedging of jet fuel for U.S. airline financial managers to utilize as a tool to mitigate the risk of jet fuel price volatility. More specifically, this study involved an exploration of the use of hedging as a financial instrument in the purchasing of jet fuel contract futures and the need for airline financial managers to consider the use of hedging as a financial tool. The focus of this

study was on financial hedging as a tool for airline financial managers because there is a gap in the existing body of knowledge in this area.

Treanor et al. (2014), Martin (2015), Armen (2013), and Gerner and Ronn (2013) examined the use of hedging as a financial tool for U.S. airline financial managers to use to mitigate the risk of jet fuel price volatility. Methods identified by these are consistent with the scope of this study and consistent with known information on the current use of hedging in the airline industry.

Strengths and Weaknesses of How Others Have Approached the Problem

Other researchers approached the use of hedging as a financial tool to mitigate the volatility of jet fuel prices in a few different ways. Treanor et al. (2014) approached hedging through a comparative analysis between operational hedging and financial hedging to determine if operational and financial hedging complement one another or substitutes for each other. The strength of this approach was the quantified comparative analysis to demonstrate the benefit of using either operational or financial hedging. Weaknesses of this approach were the limitation to only three operational hedge options and only one financial hedge option.

Treanor et al. (2014) also approached operational and financial hedging through the impact of hedging on a firm's value. The strength of this approach is the identification of the relationship between operational hedging strategies and the impact on the bottom line. Weaknesses of this approach are the lack in identifying financial hedging impacts on the bottom line and the failure to determine the relationship between operational and financial hedging strategies.

Martin (2015) approached the concept of hedging to mitigate risk in the purchase of jet fuel through a case study of Southwest Airlines. Strengths of this approach included how an individual airline used financial hedging to diversify and mitigate risk when purchasing jet fuel. Weaknesses of the approach included the lack of comparison to other airline companies that used hedging as a financial tool in the acquisition of jet fuel.

Armen (2013) approached jet fuel hedging through a comparative analysis between jet fuel price volatility, current economic conditions, and the demand for passenger air travel. Strengths of this approach include the identification of the direct relationship between economic conditions and the cost of jet fuel. The weakness of this approach is the connection between current economic conditions and passenger travel demand levels. This relationship does not contain the relationship to jet fuel price volatility.

Gerner and Ronn (2013) approached the topic of hedging jet fuel through the direct relationship between jet fuel to heating oil and crude oil on the open market. Because jet fuel is not a commodity in the free market, it is necessary to peg the cost of jet fuel to either heating oil or crude oil to establish a price index (Gerner & Ronn, 2013). Strengths of this approach include jet fuel volatility on the open market as being related to the fluctuation of heating oil and crude oil. Weaknesses of this approach include the decision factors used to determine if hedging is a feasible option for U.S. airline financial managers.

Gerner and Ronn (2013) discussed the current uses of hedging strategies within the U.S. airline industry. The volatility of jet fuel prices on the open market has an impact

on the U.S. airline company's ability to maximize profits. Jet fuel price volatility relates directly to the fluctuating price of crude oil and heating oil on the open market. Because jet fuel is not a publicly traded commodity, the representation of jet fuel is crude oil and heating oil on the open market (Gerner & Ronn, 2013). For these reasons, U.S. airline companies commonly use over the counter derivatives to base the price of jet fuel in a contract (Gerner & Ronn, 2013). The most commonly used over the counter derivative is the average cost of delivery for the period of one month (Gerner & Ronn, 2013).

Gerner and Ronn (2013) had addressed when, why, and how U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel through a literature review on the use of derivatives. Jet fuel is not openly traded on energy sector markets because the commodity relates to the price of crude oil and heating oil on the open market (Gerner & Ronn, 2013). The purchase of the jet fuel commodity typically involves a combination of options to mitigate the risk of pricing. When buying jet fuel, airline companies can use over the counter derivatives or purchase the fuel through contracts and with the use of hedging (Gerner & Ronn, 2013).

Armen (2013) had addressed when, why, and how U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel through a case study on the financial performance of U.S. airlines from 2007 to 2011. In this case study, Armen (2013) took 10-K reports of all publicly traded U.S. aviation companies into consideration. Airline companies cash flows and the cost of jet fuel are on airline 10-K financial reports (Armen, 2013). Airline 10-K reports reflect the use of derivatives in energy purchases when airlines used hedging as a tool to mitigate risk in jet fuel

purchases (Armen, 2013). When used in the sale and purchase of jet fuel, derivatives mitigate risk (Dunham, 2012).

Armen (2013) discussed the relationship between increasing jet fuel prices, economic conditions, and the demand for passenger air travel. From 2007 to 2011, the U.S. economy suffered a great decline, and the cost of jet fuel increased (Armen, 2013). These factors resulted in cash flow and profits decreases for U.S. airline companies (Armen, 2013). Cash flows are important to consider when an airline financial manager is deciding on investing in jet fuel (Armen, 2013). The cash flow performance is indicative of a company's purchasing power and the company's ability to repay debt (Armen, 2013).

Robinson (2012) addressed when, why, and how U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel through a literature review on the regulations of airport charges. Airline companies pass along airport operational expenses to customers in the form of various charges to cover expense items such as gate space rent, customer counter rent, fueling services, airport maintenance, and much more (Robinson, 2012). The strength of this approach was the identification of operational expenses involved. The weakness of this approach was how airline managers understand the use of hedging to mitigate risk through airline regulations.

Treanor et al. (2014) addressed when, why, and how U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel through an examination of operational and financial hedging. In the acquisition of jet fuel, airline companies commonly purchase in bulk. The bulk purchase of jet fuel is made through

contracts with jet fuel suppliers. Contracts are bought with the use of derivatives and hedging to mitigate the fluctuation in jet fuel pricing (Treanor et al., 2014).

Treanor et al. (2014) discussed strategies commonly used within the U.S. airline industry for companies to reduce jet fuel price risk using operational and financial hedging strategies. Operational hedging strategies are inclusive of airline fleet composition and the use of aging aircraft (Treanor et al., 2014). Airline fleet composition is the types of aircraft used by an airline to diversify the airline's fleet of aircraft (Treanor et al., 2014). Airline companies utilize a diversified fleet of aircraft as a strategy to diversify exposure to jet fuel prices and other expenses such as maintenance (Treanor et al., 2014). Different size aircraft within a fleet can result in fuel consumption savings at a time of higher jet fuel prices (Treanor et al., 2014). Airline companies commonly use smaller aircraft at times of higher jet fuel prices to diversify the exposure to jet fuel prices (Treanor et al., 2014).

Treanor et al. (2014) argued that operational hedging has a more meaningful impact on the reduction in jet fuel price exposure than financial hedging. Financial hedging is inclusive of using hedging as a financial tool to mitigate risk in the exposure of jet fuel price volatility. Using financial hedging allows for airline companies to purchase jet fuel at a specific price, a specific amount of time, and specific quantity (Treanor et al., 2014).

Treanor et al.'s (2014) research expanded on research by Adrangi et al. (2014), Armen (2013), Gerner and Ronn (2013), Martin (2015), and Treanor et al. (2014). Adrangi et al. (2014) discussed a significant relationship between the volatility of jet fuel

prices and U.S. airline company profits. This relationship was the rise in jet fuel prices corresponded to a decrease in U.S. airline company profits. The opposite also occurred where a fall in the price of jet fuel corresponded to an increase in U.S. airline company profits. Adrangi et al. (2014) attributed this relationship to the volatility of crude oil prices on the open market.

Justification for the Rationale for the Selection of Concepts

Jet fuel price volatility has a significant impact on strategic airline planning and decision making (Naumann & Suhl, 2012). Instability in jet fuel pricing has an impact on airline planning because of the impact on cash flows whereas airlines spend more on jet fuel at times of high jet fuel prices and less at times of lower jet fuel prices. The fluctuation of jet fuel prices in this concept has an impact on airline profits. Volatility in jet fuel prices caused U.S. airline financial managers to explore hedging as a viable option to mitigate risk in jet fuel prices (Treanor et al., 2014). The concept of hedging allows airline financial managers to purchase specific quantities of jet fuel through contacts at a specific price over a specific amount of time determined by the contract.

Review and Synthesis Studies Related to Key Concepts & Phenomena of Jet Fuel Hedging

What is Known about Jet Fuel Hedging?

Managing jet fuel price volatility is one of the largest challenges for any airline company in the United States (Brooks, 2012). Treanor et al. (2014), and Gerner and Ronn (2013) agreed with Brooks (2012) that jet fuel price exposure is the greatest risk to U.S.

airline companies. Some airlines utilized enterprise risk management systems to manage jet fuel price risk (Brooks, 2012), which they rely upon to identify risk accurately.

Brooks (2012) and Anderson and Lillis (2011) agreed that during times of economic downturn and high jet fuel costs, some airline companies, such as Southwest Airlines, utilized hedging strategies to mitigate the risk of jet fuel prices. At times of high jet fuel prices, Southwest Airlines hedged jet fuel prices and saved on jet fuel cost (Brooks, 2012). When the cost of jet fuel declined, Southwest Airlines reduced their net fuel hedge position (Brooks, 2012). The use of financial hedging to mitigate risk and exposure to jet fuel prices at the right times can result in significant cost savings.

At times of high jet fuel prices, U.S. airline companies have difficulty managing cash flows because of the greater fuel expense (Tarry, 2011). Brooks (2012) and Tarry (2011) agreed that U.S. airline companies use hedging at times of higher jet fuel prices to limit exposure to higher prices in the short term. This strategy also has an impact on an airline company's cash flow and investment and debt policy.

Higher jet fuel prices also pose a challenge to U.S. airline financial managers in the development of accurate forecasts (Tarry, 2011). The development of forecasts and forecasting models is critical to the airline's operations because the forecast can indicate future profits and expenses (Armen, 2013). Brooks (2012) and Tarry (2011) agreed with Armen (2013) on operational forecasting being a challenge for U.S. airline finance managers at times of high jet fuel prices. Escobari and Lee (2014) agreed with Armen (2013) on operational forecasting challenges. On the other hand, the ability to forecast the

number of passengers for a specific flight impacts the selection of flight equipment, which in turn impacts potential profits.

Forecasting profits and expenses may also have a bearing on the decision to use hedging as a financial tool to mitigate the risk of rising jet fuel prices (Tarry, 2011). In contrast to the increase in jet fuel prices, forecasting can also pose an issue at times of lower jet fuel prices (Tarry, 2015). The fluctuation of jet fuel prices represented a risk to U.S. airline companies when the price declined, and the airline exercised hedging strategies (Tarry, 2015). In the case of Delta Airlines in 2014, the airline company used hedging in the purchase of jet fuel, and later the jet fuel prices fell with falling crude oil prices (Dunnn & Russell, 2015). Delta Airlines had an adverse impact on profits and caused reported losses for the first part of 2015 (Dunnn & Russell, 2015). Airlines are utilizing enterprise risk management systems to mitigate this risk.

With the use of an enterprise risk management system, carriers like Southwest Airlines can effectively manage risk (Brooks, 2012). The goal of managing risk is to mitigate unwanted exposures (Brooks, 2012). Enterprise risk management has a primary objective of preserving or creating value for various stakeholders (Brooks, 2012). Preserving or creating value for different stakeholders may involve mitigating risk and the savings being contributed to the bottom line (Brooks, 2012).

Utilizing hedging as a financial tool to mitigate risk in the purchase of jet fuel has also proven to provide a savings and contributed to the bottom line (Gerner & Ronn, 2013). Hedging jet fuel allows for airline companies to purchase jet fuel in the form of contracts (Gerner & Ronn, 2013). Purchasing jet fuel in the form of contracts allows for

airline companies to buy jet fuel in a specific quantity, at a fixed price, and for a specific amount of time (Gerner & Ronn, 2013).

When using hedging to purchase, jet fuel airline companies commonly use over-the-counter derivatives (Gerner & Ronn, 2013). Over-the-counter derivatives offer flexibility in the contracts sold to airline companies by financial institutions (Gerner & Ronn, 2013). Flexibility within the hedging contract allows for U.S. airline companies to have flexibility in the timing of contracts (Gerner & Ronn, 2013). This type of flexibility is attractive for airline companies because the execution time of the contract may correlate with times of rising jet fuel costs.

The basis for the decision for airline companies to use hedging is of four primary factors (Gerner & Ronn, 2013). Airlines consider financial strength and credit ratings, relationship between jet fuel consumed and the price paid, fixed and variable transaction costs, and internal risk profile (Gerner & Ronn, 2013). Credit ratings impact the rate of interest charged in the hedging fuel contract (Gerner & Ronn, 2013). The history of jet fuel consumed and the prices paid for consumed jet fuel provides a basis for hedging decisions. Fixed and variable transaction costs vary based on the method of purchasing jet fuel. Fixed transaction costs are common in hedging contracts (Gerner & Ronn, 2013). Variable transaction costs are common when an airline purchases jet fuel on the open market (Gerner & Ronn, 2013).

Financial strength and credit ratings are important factors for airline financial managers to consider in the use of hedging as a financial tool because the utilization of this instrument will have an impact on airline finances (Gerner & Ronn, 2013). With high

cash flow levels and cash on hand coupled with a high credit rating, airline companies can utilize hedging as a financial tool to purchase jet fuel (Gerner & Ronn, 2013). The financial strength and credit rating of the airline company is necessary to consider in the decision to use hedging as a financial tool. The relationship between jet fuel consumed and the price paid tells investors and managers how effective the airline company is in managing assets and controlling purchases (Gerner & Ronn, 2013).

Revenue Management and Network Systems

Network based revenue management systems have increased in overall importance because of the hub and spoke airline network models that have become more prevalent (Lapp & Weatherford, 2014). The revenue management system has a significant relationship to the type of network system used by the company. Hub and spoke airline network models represent a central gateway airport, known as the hub, connected to smaller regional airports, known as spokes (Lin & Kawasaki, 2012). Hub and spoke systems allow for central locations to connect to several other locations. Differentiation of revenue management systems within airline systems is necessary for optimal performance (Ratliff & Weatherford, 2013). Within the hub and spoke system, there is a local revenue management system at the spoke and a connecting or flow revenue management system at the hub (Lapp & Weatherford, 2014). Local revenue management systems are used in the local areas but connected to the hub location. The implementation of these revenue management systems is very challenging because many assumptions that must be made for financial managers to make optimal decisions (Lapp & Weatherford, 2014). Revenue management system implementation is critical in the

decision-making process. In addition to impacting profits, airline network systems also affect airline competitiveness (Yang, 2011).

U.S. aviation companies that follow the hub and spoke network model utilize a network-aware revenue management system (Lapp & Weatherford, 2014). The network-aware profits management system in a hub and spoke system identifies profits generated at the local level and the hub level. The network-aware system allows for U.S. airline financial managers to perform forecasting and optimization at the origin-destination level (Lapp & Weatherford, 2014). Forecasting at the origin-destination level allows managers to plan capacity and revenues. Origin-destination model brings passengers from their origin to a hub and then connects the passenger to the destination (Lapp & Weatherford, 2014). This model is a segment travel model where passengers travel on two segments. The first segment is from the origin to the hub and the second segment is from the hub to the destination. To optimize the network-aware revenue system, airline company financial managers must decide which inventory fare classes to make available for origin to the hub to destination segments (Lapp & Weatherford, 2014). Origin and destination demographics commonly serve as the basis for the selection of the fare class inventory.

Revenue management systems evolved over time to represent the type of network, either hub and spoke or point-to-point utilized by the airline company (Lapp & Weatherford, 2014). In addition to the hub and spoke network model, some airlines utilize the point-to-point network model. The point-to-point network model is a more specialized model where passengers fly from the origin point directly to the destination point (Lapp & Weatherford, 2014). Point-to-point network models are primarily used by

low-cost U.S. airline companies (Lapp & Weatherford, 2014). This network model allows for the airline companies to maximize profits by making inventory decisions that match the business strategy of point-to-point networking (Lapp & Weatherford, 2014).

U.S. airlines that have selected point-to-point as their preferred network model utilize a leg-based profits management system (Lapp & Weatherford, 2014). The leg-based profits management system allows for airline companies to make revenue management system decisions based on forecasted demand at the leg level (Lapp & Weatherford, 2014). The demand for seats from point-to-point is the basis for determining the airfare price.

Revenue management systems within the U.S. airline industry provide a mechanism to airlines for selling seats to customers (Lapp & Weatherford, 2014). This mechanism takes the inventory and the amount a customer is willing to pay into consideration when determining the fare for each seat on a flight (Lapp & Weatherford, 2014). Because airline seats are a perishable item, it is common that the price of remaining seats will decrease as the day of the departure flight approaches, when several seats remain unsold (Lapp & Weatherford, 2014). Thus, supply and demand is the model used in revenue management systems.

The price a customer pays for a flight depends on a two-step revenue management process (Lapp & Weatherford, 2014). First, the profits management system performs a demand forecast for optimal seat allocation (Lapp & Weatherford, 2014). The second step is an assignment of fare class to a price, which may or may not matches to the class

value of a fare class (Lapp & Weatherford, 2014). Fare classes within the U.S. airline industry are first, business, and coach class (Raza, 2013).

The revenue management system is responsible for determining the number of seats allocated to each fare class (Lapp & Weatherford, 2014). Efficient management of revenue is critical in the airline industry. The goal of the revenue management system is to match fares with the perceived customer's willingness to pay for the respective class fare (Lapp & Weatherford, 2014). Maximization of profits is the goal of revenue management.

Implementation of a revenue management system is a significant challenge for new and emerging U.S. airlines as well as mature airline companies that desire to change their network model (Lapp & Weatherford, 2014). New and emerging U.S. airline companies consist of low-fare airlines, and mature airlines include airlines that have been in service for several years. The selection of network model impacts the development and implementation of the revenue management system.

Mature U.S. airline companies, such as Delta Airlines, American Airlines, and United Airlines, utilize a hub and spoke network model, and new and emerging airlines, such as Southwest Airlines, Spirit Airlines, and Jet Blue Airlines, use a point-to-point network model (Lapp & Weatherford, 2014). The network model has an impact on the revenue management system because of locality and profits tracking methods (Lapp & Weatherford, 2014). Within a point-to-point network model, the revenue allocation is to the origin and destination; whereas, in a hub and spoke network model, the revenue allocation occurs across origin, connection, and destination (Lapp & Weatherford, 2014).

Within the point-to-point network system, the concept of profits management is to optimize the allocation of seats to different fare classes to maximize profits from a given flight (Arslan, Frenk, & Sezer, 2015). System analysis using statistical modeling of probabilities for bookings generates maximum profits in a point-to-point network (Arslan et al., 2015).

In addition to the hub-and-spoke and point-to-point network systems, airline companies commonly utilize code sharing and alliances (LaRoche, Gamache, & Olivier-Ouellet, 2012). Code sharing allows for partner airline companies to share routes and allows for a partner airline to use flight numbers on a flight of a partner airline (LaRoche et al., 2012). Legacy airlines, such as Delta Airlines, have found ways to utilize codesharing systems to improve overall airline profitability (O'Neal, Jacob, Farmer, & Martin, 2007). O'Neal et al. (2007) agreed with Ratliff and Weatherford (2013) that codesharing is a marketing cooperation between partner airlines and airlines within this type of marketing partnership benefit with improved profitability. However, codesharing causes complexities within revenue management systems because codesharing splits profits among airline partners that fly the same route (Belobaba & Jain, 2013).

There is a significant relationship between U.S. airline profits and jet fuel prices (Adrangi et al., 2014). The volatility of jet fuel prices has a significant impact on the total profits earned by airline companies (Adrangi et al., 2014). There is a dynamic relationship between jet fuel prices and airline company bottom-line profits based on the market volatility of jet fuel prices (Adrangi et al., 2014). Increases in jet fuel prices corresponded to decrease in bottom-line airline profits (Adrangi et al., 2014). Conversely,

decreases in the price of jet fuel corresponded to increase in bottom-line airline profits (Adrangi et al., 2014). The cost of jet fuel is the greatest expense of any airline company. These companies must manage this great expense through an efficient fuel management system.

Hedge Accounting

Managers likely consider economic and accounting factors in the decision to use hedging (Chen, Tan, & Wang, 2013). A company takes economic factors into consideration when the perceived impact on the financial conditions of the airline exists. The economic impact of using hedging relates to the effect of hedging on the companies expected future cash flow (Chen et al., 2013). An airline company's future cash flow has an impact on the economy because of the ability for the airline to purchase goods and services. Accounting factors such as a volatile impact on earnings, on a company's financial statements, are taken into consideration when hedging activities take place (Chen et al., 2013). The impact of volatile earnings on an airline company's financial statements is an accounting factor because of the impact on financial statements and earnings.

The Financial Accounting Standards Board (FASB) examined updates to derivatives and hedging accounting reporting to clarify certain reporting requirements (Financial Accounting Standards Board, 2015). As of 2015, there was no obligation for denoting the use of a derivative instrument such as a hedge accounting instrument within financial reporting (Financial Accounting Standards Board, 2015). The designation for the utilization of a derivative instrument in financial reporting would allow for all hedge

accounting criteria to be met under new FASB reporting rules (Financial Accounting Standards Board, 2015). Future 10-K reports within the U.S. airline industry must now denote the use of hedging (Treanor et al., 2014).

U.S. Airline Industry

The U.S. airline industry is responsible for significant economic contribution to the world economy (Huettinger, 2014). Local and national economies in the United States and other regions around the world have improved through contributions to employment, taxation, expenses, and other monetary investments from the U.S. airline industry (Fu, Oum, & Zhang, 2010). Since the time of deregulation in 1978, the U.S. airline industry has improved local and national economies, except during periods of economic decline (Frank, 2013).

The U.S. airline industry has experienced dramatic changes over the past decade with financial losses, bankruptcies, union disputes, and expensive mergers (Helleloid, Seong-Hyun, Schultz, & Vitton, 2015). Some have attributed financial losses and bankruptcies to the global financial crisis, also known as the great recession (Congdon, 2014). Historically high jet fuel prices contributed to significant financial losses during the time of economic downturn where the prices of crude oil were trading on the open market for around $100 per barrel from 2011 to 2014 (United States Energy Information Administration, 2015). Financial losses within the U.S. airline industry caused airline companies to file for bankruptcy within these four years.

Several U.S. airline bankruptcies occurred between just after airline deregulation, from 1978 to 1989 (Helleloid et al., 2015). Since the time of deregulation in 1978, the

U.S. airline industry had become more competitive with the emergence of new passenger carriers (Hannigan, Hamilton III, & Mudambi, 2015). In 1983, nearly 200 airlines registered with the Federal Aviation Administration. By 1993, there were 130 airlines in existence (Helleloid et al., 2015). During this period, 70 airline companies declared bankruptcy because of price-based competition (Helleloid et al., 2015). Priced-based competition has become known as the price war where airline companies were undercutting airfare prices of their competitors, and ultimately the airlines filed for bankruptcy (Borenstein, 2011). The dynamics of price-based competition have caused battles among airlines for market share and a financial return frenzy for stock market investors (Bachman, 2014). In addition to the price-based competition, union disputes have also caused financial turmoil within the airline industry.

Union disputes within airline companies in the United States dramatically changed the landscape of the aviation industry. Labor unions held a unique governance role in airline companies that suffered financial distress where the airline has filed Chapter 11 bankruptcy (Dawson, 2015). The role of governance is unique within bankruptcy because the airline company commonly asks the union for concessions to reduce the financial burden during the time of re-organization under Chapter 11 bankruptcy (Dawson, 2015).

Before airline government deregulation of the industry in 1978, the unions were very powerful in securing higher wages and a larger number of positions for union members (Helleloid et al., 2015). After deregulation, low fare air carriers entered the airline market, and the concept of unionization became fragmented whereas low fare

airline companies had little to no unionization or union representation (Helleloid et al., 2015). Low-fare carriers, such as Southwest Airlines, Air Tran Airways, Jet Blue Airways, and Spirit Airlines, have changed the airline industry (Murakami, 2013).

To remain competitive with low fare airlines, legacy carriers such as American Airlines, Delta Airlines, and United Airlines had to reduce their average airfare (Tan, 2016). Since the time of deregulation, several low fare airline companies have emerged in the market. With significant competition providing the same basic service for similar airfare there was a need for airlines to reduce costs to maintain profit margins (Tan, 2016). Alternatively, legacy carriers have the option to increase airfare to cater toward brand loyal customers and focus on quality and brand loyal customer retention (Tan, 2016). Airline competition is necessary for the industry to continue to grow.

Airline company competitiveness is a result of low expenses through lean operations, profit maximization, and the size of the airline company (Hannigan et al., 2015). Throughout the past decade, there have been several mergers and acquisitions within the airline industry (Bilotkach, 2011). Several mergers and acquisitions emerged because of rising jet fuel costs, labor relations, strategic management business models, and high risk (Bateman & Westphal, 2011). Mergers and acquisitions existed in the airline industry shortly after the time of deregulation in 1978.

In recent years, there have been several major mergers between some carriers to form larger, stronger, and improved airline companies to provide service around the world. One major merger was between U.S. Airways and America West in 2005 for 1.5 billion dollars (Bougette, Hüschelrath, & Müller, 2014). Bolte (2014) agreed with Martin

(2012) this merger came about because U.S. Airways was in Chapter 11 bankruptcy and acquired America West to reorganize (Bolte, 2014). Bougette, Hüschelrath, & Müller (2014) agreed with Evripidou (2012) the motives for mergers and acquisitions in the U.S. airline industry are dependent on the needs of the acquiring airline company.

One of the largest airline mergers occurred in 2008 for 3.1 billion dollars when Delta Airlines merged with Northwest Airlines (Bateman & Westphal, 2011). This merger came about in response to the fact Delta Airlines was in Chapter 11 bankruptcy, economic recession, rising expenses such as jet fuel costs. To emerge from bankruptcy and to combat rising expenses, the merger of Delta Airlines and Northwest Airlines took place after approval from the U.S. Department of Justice (Luo, 2014). Bateman and Westphal (2011) and Lou (2014) agreed this merger was the beginning of several more legacy airline mergers in the United States.

After the merger between Delta Airlines and Northwest Airlines, there was another merger between Southwest Airlines and AirTran in 2011 for the amount of 1.4 billion dollars to become a much larger low fare airline company (Helleloid et al., 2015). This merger benefited Southwest Airlines whereas the airline company realized significant profits increases through airfare and new markets being serviced (Brooks, 2012). The merger became known as a major merger between two low-fare airline companies.

Another major airline merger was in 2013 for 11 billion dollars between American Airlines and U.S. Airways to form the largest airline company in the United States (Bolte, 2014). This merger also occurred because American Airlines was in

Chapter 11 bankruptcy and to emerge from bankruptcy the airline needed to acquire U.S. Airways (Bolte, 2014). Bolte (2014) agreed with Gillespie and Richard (2012) that the U.S. Department of Justice originally opposed the merger citing the development of a monopoly within the airline industry. However, the U.S. Department of Justice later approved the merger citing several new low-fare carriers competing within the same markets served by both airlines. This merger was the latest in a series of mergers among legacy carriers.

Evidence from these mergers shows a relationship to Chapter 11 bankruptcy and the need to emerge from bankruptcy through reorganization in the form of a merger (Chan, 2014). In addition to the emergence from bankruptcy, because of the major mergers there was and continues to be opposition to these mergers from the U.S. Department of Justice with respect to anti-trust in mergers that may form monopolies in the airline industry (Mehta, Nevo, & Richard, 2014). Through the power of mergers, airline companies form one entity and often can streamline operations with a new centralized hub-and-spoke system to maximize profits and reduce expenses and to be more efficient (Giroud, 2013).

Increasing airline effectiveness is the primary purpose of many systems within the U.S. airline industry. Utilization is a system measure that airlines use to manage aircraft capacity effectively based on the rise and fall of passenger demand levels (Cannon, 2014). Balancing between aircraft capacity and passenger demand levels allows airline companies to utilize resources properly. Sticky costs adjust to the changes in aircraft capacity levels (Cannon, 2014). The adjustment in aircraft capacity levels is a behavioral

reaction to passenger demand levels. Sticky costs are behavioral costs that respond asymmetrically to increases and decreases in activities (Cannon, 2014).

When managers adjust selling prices and aircraft capacity to match sales volume and output, there is an impact on sticky costs (Cannon, 2014). Sticky costs assist in the balance between selling prices and aircraft capacity to sales volume and output. The systematic management of aircraft capacity and selling prices are critical to the maximization of utilization systems (Cannon, 2014). Maximization of U.S. airline companies' utility between capacity and sales volume is the goal for management to accomplish.

Sticky costs apply to the situation when managers add aircraft capacity because more costs exist when demand is growing and falling (Cannon, 2014). Managers commonly respond to the changes in demand by adjusting the selling prices to match current sales volume levels to existing aircraft capacity levels (Cannon, 2014). In response to changes in demand, managers also can adjust aircraft capacity to meet demand (Cannon, 2014).

The U.S. airline industry follows one of two network systems, hub and spoke or point-to-point (Lapp & Weatherford, 2014). Low-cost airline companies commonly use a hub and spoke network systems are commonly used among mature U.S. airlines and point-to-point network systems. There is a significant importance to identify the network system of choice early in the development of an airline company.

The main theme of this study was the U.S. airline industry and the use of financial tools such as hedging to mitigate the risk of jet fuel. In 1978, the United States

government had deregulated the U.S. airline industry. Rose (2012), Brown (2014), and Mantina and Edward Wang (2012) agreed that the deregulation of the U.S. airline industry allowed for more competition between airlines, new airlines to enter the market and no government control over fares. Since the time of deregulation in 1978, the U.S. airline industry experienced a significant amount of turbulent changes (Rose, 2012). The U.S. airline industry suffered significantly from terrorist attacks, financial crisis, and operational issues since the time of airline deregulation. Airline deregulation failed because the deregulated aviation industry experienced significant struggles (Rose, 2012). As one result, a level of uncertainty over future regulations within the U.S. airline industry existed (Engau, Hoffman, & Busch, 2011).

The terror attacks on the United States on September 11, 2001, had a profound impact on the U.S airline industry from several points (Brady, 2012). Author Rose (2012) mentioned the terror attacks caused a near collapse of the U.S. airline industry and a failure of deregulation. In concurrence, author Brady (2012) mentioned the total shutdown of the U.S. aviation industry for three days following the terror attacks have had long lasting effects on the industry. The U.S. airline industry recognized immediate financial losses from the total shutdown and the dramatic decrease in passenger traffic in the following years (Brady, 2012).

U.S. airline companies financial and operational struggles are a result of the terror attacks of September 11, 2001 (Brady, 2012). However, the U.S. airline industry suffered from financial losses before the terror attacks. In the first fiscal quarter of 2001, most airlines have reported significant financial losses because of a weakening U.S. economy

(Brady, 2012). The downturn in the economy translated into less corporate travelers flying because of reduced budgets (Brady, 2012).

After the terror attacks of September 11, 2001, the U.S. airline industry sustained a significant financial loss that forced the airline companies to change their practices (Brady, 2012). Mantina and Edward Wang (2012) concurred with author Brady (2012) that the U.S. airlines had seen a significant decline in profits after the terror attacks, and many of the airlines ended up in Chapter 11 bankruptcy. Chapter 11 bankruptcy protects airline companies from their creditors and allows them to operate while they reconstruct their operating strategies (Mantin & Edward Wang, 2012). The airlines streamlined operations by cutting service to select cities and by eliminating shuttle service entirely (Brady, 2012). These changes also had a negative impact on airline employees, which saw opposition from union employees that fought the airlines on these changes (Brady, 2012). The infighting between unions and airlines caused, even more, financial instability and contributed to more financial losses. These changes were necessary for the airlines to emerge from bankruptcy (Mantin & Edward Wang, 2012).

Managing Human Resources within the U.S. Airline Industry

Addressing airline employment relations after airline deregulation has become increasingly challenging with unionization, maintenance labor costs, procedural compliance, and other regulations (Hampson, Junor, & Gregson, 2012). These expenses caused airline companies to experience rising expenses and to address these rising expenses proactively to increase profits by charging customers' additional fees and higher airfares. This cause and effect had an impact on airline public relations.

Unionization of the aviation industry encouraged employees to utilize an individual voting behavior and to rationalize belonging within an organization (Eaton, Rogers, Chang, & Voos, 2014). The concept of unionization allows for improved employee relations where the encouragement of employees to remain in the airline company's employ is common. Unions negotiated union member's wages within the airline industry within labor contracts (Eaton et al., 2014). The concept of salary negotiations allows employees to have more power and control in their employment. Wages guaranteed through labor contracts has a significant influence on the overall labor costs (Eaton et al., 2014). Guaranteed wages create the common understanding that there is a rise in expenses to guarantee these salaries. Labor costs increased significantly due to the increase in labor contracts negotiated through unions (Eaton et al., 2014). The increase in expenses is the second largest expense in the airline industry, only second to the cost of jet fuel and maintenance expenses.

Labor relations between unions and airline companies resulted in a significant rise in maintenance labor costs over the past 15 years (Benmelech et al., 2012). The rising cost of maintenance labor resulted in higher airline company expenses. Customers ultimately pay for the rise in these expenditures in the form of additional fees and higher airfare. Because many maintenance crews are unionized, labor contracts are constantly re-negotiated in an effort for airlines to reduce labor expenses (Benmelech et al., 2012). The continual renegotiation of maintenance labor wages reduces labor expenditures and assists airline managers to have better control over these expenses.

Procedural compliance within the aviation industry in human resources involves the scheduling of multi-skilled employees across multiple locations (Kuo et al., 2014). Legal procedural compliance is a very expensive component of the human resource. Human resource managers, operational managers, finance managers, and all other staff must continually complete training to maintain current knowledge of policies, procedures, laws, and other various compliance items.

Fu (2013) addressed when, why, and how airline managers would utilize human resource tools to improve airline operations through a study of the direct effect of organizational commitment on organizational leadership behavior of flight attendants to analyze the role of high-performance human resource practices. Flight attendants' commitment was stronger when the airline company adopted high-performance human resource practices (Fu, 2013).

Neto, Smith, and Pedersen (2014) addressed when, why, and how airline managers would utilize human resource tools to improve airline operations through a study of learning technologies for employee training. Because of the high expenses of labor in the aviation industry, airline managers have attempted to reduce the high labor expenses through training efforts. To control training expenses, airline managers utilized learning technologies such as online courses (Neto et al., 2014). However, the online course training method does not take cultural differences into consideration (Neto et al., 2014). Cultural differences have an impact on how individuals learn. This impact influences how airline companies operate. Failure to incorporate cultural differences into

the development of training courses online resulted in ineffective online learning for airline employees (Neto et al., 2014).

Jolly, Reid, and Hoanca (2013) addressed when, why, and how airline managers would utilize human resource tools to improve airline operations through a case study on the use of operational management software. Airline companies have low-profit margins because of the high wages and operating expenses such as jet fuel. Operational management software such as Plane Track assists management in controlling expenses and provides management with expert level reports (Jolly et al., 2013). The challenge with using technology to manage operations of an airline is incorporating employees into the software. Training employees to utilize the software is challenging based on how employees train. Providing employees with the necessary training without simply providing them with a user manual is critical to operational success (Jolly et al., 2013). In addition to operational software, airline companies also commonly utilize human resources software to manage the human capital.

Scully (2013) addressed when, why, and how airline managers would utilize human resource tools to improve airline operations through an examination of the use of agile human resources software. Airline companies utilize agile human resources software with the concepts of employees over processes and tools, working software over comprehensive reports and response to changes in the plan (Scully, 2013). Human resources software can be an effective tool for managers to control labor expenses. However, the users must receive adequate training, and they must fully utilize the software for the software to be effective.

Kaufman (2013) addressed when, why, and how airline managers would utilize human resource tools to improve airline operations through a case study of Delta Airlines and the structure of a program of employee involvement. Delta Airlines has undergone several changes over the past several years, including the potential for bankruptcy. Employees stay with specific organizations because of the existents of an employee involvement program. The employee involvement program is the commitment model for employees at Delta Airlines (Kaufman, 2013).

What is Controversial about Jet Fuel Hedging?

Financial managers within the U.S. airline industry understand the risk involved when using hedging as a financial tool in the purchase of jet fuel (Tokic, 2012). One major risk that is very controversial is speculation of jet fuel prices and the bubble of jet fuel prices (Tokic, 2012). Speculation is a controversial practice because it is tough to predict the market behavior of commodities such as crude oil (Tokic, 2012).

Bubbles within market prices for commodities such as crude oil are a time series of upswings and downswings of market prices of commodities (Tokic, 2012). Market swings in crude oil relate to the jet fuel market price. When the bubble bursts, the market price of the commodity declines at an accelerated rate (Tokic, 2012). Because crude oil is a price index for jet fuel, the bubble of crude oil has a direct impact on jet fuel prices. Airlines use hedging as a financial tool, as an option to mitigate the risk of the rise in jet fuel prices in the open market (Tokic, 2012).

Speculation of commodity prices on the free market is a controversial practice within the U.S. airline industry because of the associated risk (Tokic, 2012). Huang and

Zhang (2015) agreed with Tokic (2012) on the speculation of commodities such as crude oil within the open market relates to the risk of purchasing jet fuel on the free market with the use of derivatives. In the event of a rise in jet fuel prices, the airline may speculate on when the increase in price will end (Tokic, 2012). This speculation is risky when an airline engages in financial hedging and discovers the speculation was incorrect, and there is a recognition of lost revenue (Tokic, 2012). However, an airline may engage in speculative hedging at the risk of loss, and there is insurance from lost revenue through abridging the difference in price and passing the expense on to the customer (Tokic, 2012).

Through the concept of speculation, Huang and Zhang (2015) agreed with Tokic (2012) there will be an impact on the decision to use hedging to mitigate risk in the purchase of jet fuel. The decision to use hedging to mitigate risk in the purchase of jet fuel through speculation carries a certain amount of risk (Triana, 2011). Speculation of fluctuating jet fuel prices is risky because of market uncertainty and danger of using a financial tool such as hedging at the wrong time (Triana, 2011).

Jet fuel prices remain to be the greatest expense for airline companies around the world (Troutt III, Bliss, & Depperschmidt, 2014). Optimization must take effect for U.S. airlines effectively to utilize jet fuel (Troutt III et al., 2014). During times of economic recession and high jet fuel prices, airline companies effectively managed jet fuel systems to mitigate losses (Troutt III et al., 2014). Within fuel management systems it is important to understand the perceptions of fuel management efforts from managers and employees (Troutt III et al., 2014). The perception of fuel management systems is equally

as important as the system itself because the perception of employees is the actual jet fuel management system (Troutt III et al., 2014).

Managing the consumption of jet fuel in real-time through a jet fuel management system provides a competitive advantage to U.S. airline companies (Atuahene, Corda, & Sawhney, 2011). To understand the consumption of jet fuel, airlines installed real-time displays on most commercial aircraft (Atuahene et al., 2011). Understanding the consumption patterns required data gathering of real-time flight information and flight patterns (Atuahene et al., 2011). Based on the real-time data gathered, U.S. airline companies adjusted flight patterns and physical aircraft design to more efficiently manage the consumption of jet fuel (Atuahene et al., 2011).

Because of high jet fuel costs, weak demand, and increased low-cost airline competition there are significant challenges for U.S. airlines to earn a profit (Borenstein, 2011). These were important factors during a significant downturn in the U.S. economy and during a time of high energy costs. In the current economic environment, U.S. airline companies are recognizing strong profits, high demand, and lower energy costs.

The decision-making strategy of U.S. airline companies incorporated changes in fuel efficiency (Reiman, Johnson, & Cunningham, 2011). It is possible to embed fuel efficiency within a U.S. airline's organizational culture by measuring the fuel efficiency index (Reiman et al., 2011). When an organization focuses on fuel efficiency, improvements can be made to improve airline profitability (Reiman et al., 2011). In addition to incorporating fuel efficiency into the culture of U.S. airline companies, fuel efficiency must be an integral part of the supply chain (Reiman et al., 2011). Thus, use of

the fuel efficiency index can improve strategic decision making and supply chain fuel efficiency (Reiman et al., 2011).

Another way to manage jet fuel more efficiently is by adopting new technologies, such as towing vehicles that reduce fuel consumption (Bazargan, Lange, Tran, & Zhou, 2013). Towing vehicles tow the aircraft to and from the gate (Bazargan et al., 2013). However, the upfront expense of new technologies such as towing vehicles is less attractive to financial managers than the long-term expense of increased jet fuel consumption (Bazargan et al., 2013). Jet fuel and employees are the two major contributing expenses to the overall operating expense of an airline company (Bazargan et al., 2013).

Purchasing jet fuel using hedging as a financial tool is not without risk (Triana, 2011). Some airlines use hedging with derivatives; while the clear majority of other airlines use unhedged options, collar structures, and swaps as part of their desired financial strategy (Gerner & Ronn, 2013). When an airline uses hedging to purchase jet fuel and secures a futures contract, the airline accounts for this purchase as a liability on the balance sheet (Triana, 2011). Hedging jet fuel is a substantial risk if rates and terms of the futures contract change (Triana, 2011).

What Remains to be Studied about Jet Fuel Hedging

To date, no researcher explored the managerial decision to use hedging as a financial tool to mitigate risk within the U.S. airline industry. Treanor et al. (2014), Martin (2015), Armen (2013), and Gerner and Ronn (2013) have identified and explained the utilization and results of airlines using hedging. However, no known study involved

the examination of when, why, and how U.S. airline financial managers use hedging as a financial tool to purchase jet fuel. Treanor et al. (2014) have suggested the need for future research of this type.

Hedging is a risk management strategy used by airline financial managers to mitigate the risk of losses due to the fluctuation in commodities prices such as jet fuel (Treanor et al. 2014). There are many hedging strategies used by airline companies like derivatives to hedge risk such as futures contracts (Du, Wang, & Du, 2012). No researchers explored how airline managers decide to use hedging as a financial tool to mitigate risk in the fluctuating price of jet fuel, which is the focus of the proposed study.

Summary and Conclusions

Major Themes in the Literature

There were five major themes discussed in this chapter: (a) hedging, (b) risk management, (c) modern financial theory, (d) decision-making models, and (e) U.S. airline industry.

How this Research Study Fills Gaps in the Literature

There were significant studies on the use of hedging to mitigate risk and exposure from the volatility of jet fuel prices. Previous quantitative studies focused on the operational impact of jet fuel instability. However, no researcher addressed the managerial decision to use hedging as a financial tool to mitigate risk within the U.S. airline industry. In this study, the focus is on when, why, and how U.S. airline managers would use hedging as a financial tool to mitigate risk in the purchase of jet fuel to fill the gap in the literature and to expand the existing boundaries of knowledge.

The literature review section included an introduction to the problem statement and purpose of the study, and an exhaustive literature analysis and synthesis. The next chapter will include the details of the research methodology and design, as well as the role of the researcher, issues of trustworthiness, and a discussion of ethical issues inherent in the study design.

Chapter 3: Research Method

To counter the volatility of jet fuel prices, many U.S. airlines use an array of financial tools, such as hedging, to stabilize and minimize the risk of exposure to fluctuating prices (Treanor et al., 2014). Fluctuations in the cost of jet fuel, which has become more common over the past several years, has increased pressure on all airlines to maintain positive cash flows (Treanor et al., 2014). There is no viable hedge option available for the expense of jet fuel (Treanor et al., 2014). Some airlines use hedging with derivatives; however, most airlines use unhedged options, collar structures, and swaps as part of their desired financial strategy (Gerner & Ronn, 2013). The purpose of this study was to explore the use of hedging as a financial tool for U.S. airline financial managers as a viable option to reduce exposure from the volatility of jet fuel prices.

This chapter includes a discussion of the research design and rationale intended for conducting the study, an in-depth overview of the grounded theory design, and a discussion of my role in the investigation. This chapter also includes the research participant selection logic, instrumentation for the collection of data, procedures for participant recruitment, participation, and data collection. Finally, this chapter includes a plan for data analysis and a discussion of issues of trustworthiness.

Research Design and Rationale

The research questions for this study were

General Research Question:

When, why, and how would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices?

Sub Research Questions:

RQ1. When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel?

RQ2. Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

RQ3. How could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

There is a need for U.S. airline financial managers to explore the use of financial hedging to mitigate jet fuel price volatility at a time of lower jet fuel prices from a qualitative perspective. Grounded theory qualitative research was the best choice in methodology for this study because there is not enough information known about the use of hedging jet fuel prices and the relationship to airline financial managers and their ability to mitigate the risk of jet fuel price volatility. The purpose of this study was to explore the use of financial hedging as a financial tool for U.S. airline financial managers as a viable option to reduce the risk of exposure from the volatility of jet fuel prices. Also, the purpose was to discover why, when and how U.S. airline financial managers use hedging as a financial tool to mitigate the risk of fluctuating jet fuel prices. Grounded theory was the most viable option for this study because the design allows for the

constructivist point of view, where the basis for constructing concepts and theories is the data gained from participants' insights into lived experiences (Corbin & Strauss, 2015).

Other qualitative research design of narrative research, case study, phenomenology, and ethnography were considered but not selected for this study because these methods are not the most effective for providing a basis for answering the research questions. When, why, and how U.S. airline managers use hedging as a financial tool to mitigate market risk in the purchase of jet fuel at a time of lower jet fuel prices was the focus of this grounded theory study.

Conducting a case study of one specific airline company, or a few companies, would not align with the research questions, which focus on the investigation of a phenomenon across multiple organizations. The phenomenological approach would fit if the only reason for doing the study were to learn more about the use of hedging as a financial tool followed trends within the U.S. airline industry and the results from the use of hedging across some air carriers. The selection of grounded theory as the research design for this study was because grounded theory closely aligns with the research questions and enables the development of new theories based on the interrelationships of the factors discovered in the study.

Role of the Researcher

My role as the researcher in this study encompassed collecting and analyzing data gathered from research participants. Data collection involved, but was not be limited to, asking research participants interview questions over the telephone. The research participants were U.S. airline industry financial managers. There was no personal or

professional relationship between participants and myself. Researcher biases and power relationships may exist in this study because there were no personal or professional relationships with the research participants. There was no need to manage power relationships as there were no power relationships within this study. Because of the researcher role and no personal or professional relationships with the research participants, there were no ethical issues such as work environment, conflict of interest, power differentials, or need to use incentives. Hence, there was no reason to have a plan for addressing ethical issues related to these matters.

This study included collecting and analyzing data from research participants through interviews and from secondary sources, such as the U.S. Department of Transportation statistical database, U.S. Department of Energy database, U.S. Securities and Exchange Commission K-10 Reports, U.S. airlines corporate websites and scholarly journals. The research questions inform the design of data collection tools in this study. RQ: When, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices? RQ1: When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel? RQ2: Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel? RQ3: How would U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

Methodology

Strengths of Grounded Theory

Advantages of using grounded theory as a method of inquiry are an intuitive appeal, invoking creativity, potential of conceptualization, systematic approach to data analysis, and data depth and richness (El Hussein, Hirst, Salyers, & Osuji, 2014). The intuitive design of grounded theory appeals to pragmatic researchers (El Hussein et al., 2014).

Researchers utilize empirical data collected through the grounded theory methodology to develop concepts and theories (El Hussein et al., 2014). The developed concepts and theories outside the scope of testing hypothesis invoke creativity where there are no defined restrictions to the research process. This process allows for the emergence of original findings from the data (El Hussein et al., 2014). Original findings discovered by collecting and analyzing data enable the development of new concepts and theories.

The use of grounded theory as a method of inquiry influences the generation of concepts from the research data (El Hussein et al., 2014). Conceptualization is an important component of research where scientists use concepts to understand and explain the findings in a meaningful way. The utilization of grounded theory methodology by researchers can generate concepts through constant comparisons and frequent writing (El Hussein et al., 2014). Concepts developed by researchers using grounded theory help to validate the merits of grounded theory as a logical research approach.

A systematic approach to data collection is a strength of grounded theory, characterized by a rigorous comparison of data gathered and analyzed to the logic of the study (El Hussein et al., 2014). The comparison of collected data to logic validated the

collection of data to support claims from the researcher. The substantial amount of data collected via the systematic collection and analysis of data provides evidence that supports claims made by the researcher in a grounded theory study (El Hussein et al., 2014).

Data depth and richness is a strength of grounded theory where significant amounts of collected data contain enormous amounts of relative descriptive information (El Hussein et al., 2014). Direct and descriptive data collected on the research topic is rich in information to support the researcher's claims. Testing the hypothesis with this information is critical to present results with the utilization of logic applied to the data; the researcher must continually reanalyze the data to refine the emerging theoretical framework (El Hussein et al., 2014).

Weaknesses of Grounded Theory

Disadvantages of using grounded theory as a method of inquiry are that it is an exhaustive process, there is a potential for methodological errors, and researchers do not develop assumptions based on a literature review (El Hussein et al., 2014). Also, there are multiple approaches to grounded theory, and the findings of a grounded theory study have limited generalizability (El Hussein et al., 2014). Grounded theory as a method of inquiry involves a significant amount of open coding, which could overwhelm a researcher and exhaust energy (El Hussein et al., 2014). The process of open coding within grounded theory is very time-consuming; the entire process may take months.

Another disadvantage of using grounded theory as a method of inquiry is the potential for methodological errors. The failure to control the data collection process

through the emerging theory or concepts generated through grounded theory will result in methodological errors (El Hussein et al., 2014). Methodology errors may cause clashes with contending methods and ultimately distort collected data. Glaser and Strauss (1967), the developers of grounded theory, had differing backgrounds and opinions on the approach for developing the method (El Hussein et al., 2014). Glaser (1967) had a quantitative approach, while Strauss (1967) had a qualitative approach. Thus, they clashed in the development of the grounded theory methodology. Conflicting concepts persist today and cause confusion among researchers. The reason for using the methodology guide of Corbin and Strauss (2015) in conducting this study was to minimize the possibility of conflicting concepts distorting the findings.

Reviewing literature without developing assumptions is another disadvantage of using grounded theory as the method of inquiry. Researchers who use grounded theory as a method of inquiry often do not to conduct a literature review before data collection for their study because of the potential for researcher bias (El Hussein et al., 2014). Not conducting a literature review may result in an oversight of potential gaps in the literature that contributed to the overall study. The purpose of conducting an exhaustive literature review for this proposed study was to reduce the possibility of this happening.

Limited generalizability is another disadvantage of grounded theory (El Hussein et al., 2014). Data collected based on human experiences is the basis of grounded theory (El Hussein et al., 2014). Findings based on human experiences are difficult to generalize in exploratory studies because the anticipated results of a grounded theory study may have significant variation (Lal et al., 2012).

Current Uses of Grounded Theory

Lawrence and Tar (2013) discussed grounded theory as applied to research in information systems. Researchers often omit contextualized facts in grounded theory studies of information systems (Lawrence & Tar, 2013). The contextual focus of grounded theory as a method of inquiry provides researchers with specific information that provides direction of the research. The contextual focus for researchers is a focus on the content that is most relevant for their research without the additional literature that may cloud focus.

The use of grounded theory provides researchers with the ability to interpret the collected data rather than simply viewing raw collected data (Lawrence & Tar, 2013). Interpreting the information found through the grounded theory approach is more useful for researchers within the information systems discipline than information collected through other research approaches. The interpretation of information led to the creation of new theories, which is the foundation of grounded theory (Lawrence & Tar, 2013).

Grounded theory is now more commonly used within research for information systems because of the context base, process orientation, and explanation of the phenomenon (Lawrence & Tar, 2013). The contextual data that is process oriented discovered through grounded theory research approach is valuable to the researcher using grounded theory. Grounded theory is a general style of doing analysis that does not focus on a discipline and thus applies to information systems as a hybrid discipline (Lawrence & Tar, 2013).

Participant Selection Logic

The sampling strategy for the selection of study participants was the selection of participants based on the job position within the U.S. airline industry. Specifically, participants who hold or have held financial management positions and can make financial decisions were ideal participants for this study. This type of sampling is a way to maximize variation sampling because the goal is to represent the widest possible range of the characteristics of interest in the study (Merriam & Tisdell, 2015). These financial position titles included Chief Financial Officer, Investment Manager, Financial Analyst, Purchasing Manager, Aviation Fuel Manager, and Operations Manager or similar positions. The participants in these positions likely have the authority to use hedging and make decisions on when, why, and how to purchase jet fuel.

There were 20 research participants selected for this study based on the number of airline companies currently operating in the United States. Of the 200 research participants invited to participate, some participants experienced organizational changes in one U.S. airline company at the time of this study. The number of respondents to the invitation was 26 total respondents, of which 20 participants could answer the interview questions. The response rate was 13% of the target population. This number of participants from multiple U.S. carriers was sufficient to achieve data saturation. Data saturation occurs when the cycles of data collection and analysis produce no new insights or dimensions (Corbin & Strauss, 2015). Research participant identification was through an examination of corporate organizational charts. The method for contacting research participants was through their respective corporate offices via telephone, email, and

professional networking. The basis for recruiting participants was their interest in participating in the study. This nonprobability sampling is a form of purposeful sampling because the goal of utilizing this sampling strategy in the participant selection process is the insight gained from the various perspectives of the study participants (Merriam & Tisdell, 2015).

Instrumentation

In addition to personal interviews with the participants, other data sources enhanced the reliability of the study through the process of demonstrating findings. These other data sources included the U.S. Department of Transportation statistical database, U.S. Department of Energy database, U.S. Securities and Exchange Commission K-10 Reports, U.S. airlines corporate websites and scholarly journals. Corbin and Strauss (2015) grounded theory methodology assisted in the analysis of data collected through interviews with participants in financial positions within the U.S. airline industry. NVivo (2016) software stored and managed the data. My role as the researcher in this study was to act as the instrument for data collection and analysis. Consent forms provided protection for study participant's rights and provided participants with an upfront overview of information to be collected in the study. Specific training received from National Institutes of Health on the protection of human research participants assisted in the protection of participants and the data collected.

The preferred primary method of collecting data from research participants was face-to-face interviews. However, when face-to-face interviews were not possible, it was necessary to use tools such as the telephone or web conferencing services like Skype to

conduct the interviews. I developed and used an interview protocol to maintain consistency and integrity when working with participants (see Appendix A).

The interview protocol consisted of an interview protocol form that includes the title of the dissertation, date, time, location, name of the researcher, name of the participant, and a yes or no response to the question of whether the release form has the signature of the research participant. Also, the interview protocol form also included thanking notes to the participant for their involvement, confirms guarantee of confidentiality, identifies the length of the interview lasting approximately 60 minutes for ten questions, methods for disseminating results, and an explanation of the purpose of the study. For each question, there was be a section to record interviewee responses and reflections observed. In closing the interview, the participants were thanked for their participation, reassured confidentiality of the participant's responses, and asked permission for interview follow-up in the event there is a need to collect additional information. Interview questions were inclusive of the primary research questions for this study. The approximate length of time and number of questions ensured sufficient data collection through this interview protocol. The demonstration of data collected from questionnaires and secondary data collected through achieved databases validated interview data.

Secondary data sources included the U.S. Department of Transportation statistical database, U.S. Department of Energy database, U.S. Securities and Exchange Commission K-10 Reports, U.S. airlines corporate websites and scholarly journals. The collection of secondary data, in addition to the collection of primary data by means of

participant interviews, was necessary to enable the demonstration of the respective findings. The demonstration of secondary data helped to ensure the data collected was valid and reliable.

Procedures for Recruitment, Participation, and Data Collection

The preferred method of data collection from research participants was face-to-face interviews. However, as face-to-face interviews were not possible, internet conference software such as Skype and the telephone were the alternative preferred methods for collecting data from research participants. Scheduled interview sessions were at various intervals dependent on the availability of participants. Interviews lasted for one hour and consisted of 10 questions, of which three were primary research questions and secondary research questions to ensure holistic data collection (Appendix B). A telephone recording service recorded the interviews and then transcribed through the utilization of a transcription service. Secondary data sources included the U.S. Department of Transportation statistical database, U.S. Department of Energy database, U.S. Securities and Exchange Commission K-10 Reports, U.S. airlines corporate websites and scholarly journals. This type of collected data demonstrate findings with the data gathered from interviews. The demonstration of findings ensured the qualitative reliability and validity of data gathered from interview participants. The researcher was responsible for the collection of data. It was necessary to collect data from secondary data sources before the collection of primary data through interviews. The collection of secondary data before the collection of data from research participants provided a baseline of data. The baseline data collected from secondary sources helped in the

identification of relationships between the secondary data and data collected from research participants. There was an important need to collect secondary data to reach the point of data saturation. Data saturation is the point at which there are no new patterns or trends identified in the collected data (Corbin & Strauss, 2015). The recording and documentation of secondary data sources were critical in the validation of collected primary data. The demonstration of findings and validation of data stem from the secondary data and the findings from the primary data gathered in interviews.

At the conclusion of interviews, I provided reassurance to participants of the confidentiality of their data. Follow-up interviews were necessary for the collection of additional information. The researcher thanked participants in person for their time in participating in the interview. Each participant also received a thank you note within three days of participation in the interview.

Data Analysis Plan

The interview protocol contained each research question and the data collected from interviews inclusive of participant responses to research questions. For coding interview transcription data, it was necessary to constantly compare all transcripts make notes about first impressions, and read each transcript again line by line throughout the continual collection of data. Repeating this process was necessary for each research participant. As described in the next paragraph in more detail, coding of collected data consists of applying labels to relevant words, phrases, sentences, and sections of the collected participant data. Identifying a core category through this process was important in building a substantive theory (Merriam & Tisdell, 2015). The use of NVivo (2016)

coding software kept track of data collected from research participants. Constant comparison of collected data was necessary to identify anomalies that stem from discrepant cases that were contradictory, variant, or non-conforming to the data collected from participants that provide a different perspective or alternative to an emerging pattern (Merriam & Tisdell, 2015).

There are three phases of coding that utilizes grounded theory studies that are known as open coding, axial coding, and selective coding (Corbin & Strauss, 2015). Open coding is the tagging of data relevant to the study, axial coding is the relation of data categories and related properties to each other to refine the category scheme, and selective coding is the development of a core category (Merriam & Tisdell, 2015). Another phase of coding was a focused coding where the utilization of frequently identified codes shift, sort, synthesize, and analyze large amounts of data (Charmaz, 2014). The analysis of collected secondary data from the mentioned databases involves focused coding. The analysis process to assist in the organization of the collected data from each data bank includes the use of NVivo (2016) software. Discrepant cases that provide alternatives to emerging patterns or alternative perspectives to research questions are outliers in the collected data (Merriam & Tisdell, 2015).

The relationship between collected secondary data to each research question was through the identification of data that relates to each research question. Specifically, there is a connection between jet fuel purchase questions to the airline company 10K reports found through the Securities Exchange Commission database. Questions about airline financial reports relate to the data collected from U.S. Department of Transportation

financial reports for each airline company. Research questions about jet fuel consumption and usage relate to the U.S. Department of Energy statistical database. Most the collected secondary data were quantitative. The use of open coding was necessary for the constant comparison of the collected secondary data to the collected interview data (Corbin & Strauss, 2015). The coded qualitative data ensured adherence to the grounded theory methodology.

Issues of Trustworthiness

Credibility

The internal qualitative validity establishes credibility through the demonstration of findings and data saturation, where applicable. The demonstration of findings enhanced qualitative validity through the convergence of information from different sources (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014). Converged information was from interview data and the secondary data collected from U.S. Department of Transportation statistical database, U.S. Department of Energy database, U.S. Securities and Exchange Commission K-10 Reports, and U.S. airlines corporate websites. The collection of primary data from 20 research participants and secondary data collected from each U.S. airline company mentioned in the study was to reach the point of data saturation.

Transferability

External qualitative validity in this study was the generalization of when, why, and how U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. The application of generalization was to the U.S. airline industry

and most airlines within the industry. The identification of external qualitative validity is the variation in the research participant selection process (Corbin & Strauss, 2015). The criterion for the research participant selection process is the participant's work position in the finance and accounting departments within airline companies. These positions vary in rank and scope dependent on the organizational structure of the airline company. This level of variation in the participant selection process relates to the external qualitative validity of the study.

Dependability

Dependability in this study included the development of an audit trails document. This document consisted of a full account of research decisions and activities throughout the study. The audit trails document provides external parties with the ability to audit decisions and processes on the completion of the study to confirm research findings (Carcary, 2009). The audit trails document includes a log of all research activities, memos, research journal, and data collection processes throughout the study (Carcary, 2009).

Confirmability

Confirmability in the study was a reflexivity where continually engaging in the process of self-reflection enable a researcher to become more aware of his or her actions while conducting a research study (Darawsheh & Stanley, 2014). Use of the reflexivity tool facilitates an examination of a researcher's thoughts, actions, assumptions, and expectations (Darawsheh & Stanley, 2014). The utilization of the reflexivity tool guided

the research process and helped to limit bias in the collection of data from research participants.

Ethical Procedures

Before the collection of data, the Walden University Institutional Review Board (IRB) confirmed and approved the participant selection logic, procedures for recruitment, participation, data collection, and the data analysis plan. There were no foreseen ethical concerns about participant recruitment or participation in the study. Data collected in the study was of the highest regard to security, confidentiality, and the protection of research participant information. Research participants received consent forms and replied "I consent" before participating in the study. All data collected from research participants was anonymous and confidential. The publishing of real names of participants has not happened in the study. The names of participants are highly confidential, and there was no release of this information under any circumstance. Use of an external hard drive that has restricted access helped to secure sensitive data collected from research participants that contain personal information including names for 7 years. Use of password protected files within the external hard drive ensured the restricted access to this information. Per the U.S. Department of Health and Human Services, Office of Research Integrity (2016), "When disposing of electronically data stored on computer disks, the disks will have to be erased several times and certified that data could not be recovered from them." The destruction of data will take place after a period of 7 years from the date of completion. Electronic data will be securely destroyed with the assistance of software products such as Eraser or CyberScrub (U.S. Department of Health and Human Services, 2016). Not

releasing participant's personal data ensured its confidentiality. If a participant refused to participate or withdrew early from the study, an active recruitment effort resulted in replacing that participant with another participant who was willing and able to participate. As mentioned, the recruitment of 20 participants took place when there were not enough initial participants for the study to reach the point of data saturation.

Summary

The major themes of this chapter were the research design and rationale, research methodology of grounded theory, the role of the researcher, participant selection logic and process, data collection instrumentation, data analysis process, and issues of trustworthiness. The rationale for the research design presented provides insights into how the study addressed the need for airline financial decision makers to explore the use of financial hedging to mitigate the risk of jet fuel price volatility at a time of lower jet fuel prices from a qualitative perspective. The chapter also contained a justification for selecting grounded theory from several possible research methods. The strengths, weaknesses, and current uses of grounded theory research presented to assist in understanding the application of grounded theory in this study.

The role of the researcher is an observer who collected and analyzed data from research participants. This section of the chapter included a description of actions the research will take to limit researcher biases. In addition to the role of the researcher, the chapter also included the rationale for the selection of the research participants based on the participant's roles in the U.S. airline industry and their ability to make managerial decisions. Interview data collected from research participants was the primary data in this

study. The collection of secondary data was necessary to demonstrate findings with the primary data collected through interviews. This chapter concluded with a discussion of issues of trustworthiness involving the credibility, transferability, dependability, and confirmability of the study.

Chapter 4: Results

The purpose of this study was to explore the use of hedging as a financial tool for U.S. airline financial managers as a viable option to reduce the risk in the volatility of jet fuel prices at a time of lower jet fuel prices. The central research question of the study was, when, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices? Related subquestions were

RQ1. When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel?

RQ2. Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

RQ3. How could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

This chapter includes a description of the research setting, demographics and characteristics of research participants, and data collection and analysis procedures; a discussion of credibility, transferability, dependability, and confirmability issues; and a presentation of study results. In describing the research setting, I consider personal and organizational conditions that influenced participants or their experience and which may influence the interpretation of the study results. In describing participant demographics and characteristics, I note the number of participants and location, frequency, and duration of data collection. Presented in this chapter are variations in data collection from the plan presented in Chapter 3. Also presented are unusual circumstances encountered in

data collection. Included in the data analysis are specific codes, categories, and themes that emerged from the data using participant quotations. Also described are qualities of discrepant cases and how discrepant cases impacted the analysis.

Research Setting

Three face-to-face research participant interviews took place in a nearby hotel conference room in Washington, DC. The remaining 17 research participant interviews took place over the telephone. The research participants represented a wide array of individual managers across the U.S. airline industry with varying levels of experience. Some research participants had more experience with the use of hedging as a financial tool while others had more experience using other financial tools.

Some of the 200 prospective participants experienced organizational changes in one U.S. airline company at the time of this study. The number of respondents to the invitation was 26 total respondents; of this number, 20 participants met eligibility requirements. Changes in personnel influenced the level of participation within certain U.S. airline companies, as the originally contacted employees no longer worked for the airlines. In other instances, the originally contacted employee was “not willing to divulge company information.”

Demographics

Participants represent the study population of U.S. airline industry professionals who hold or have held positions that involve the use of hedging. Research participants represent a socially diverse population that varies in ethnicity, age, sex, nationality and education. Of the 20 research participants, three participants were women while 17

participants were men. The age of the research participants was between 20-70 years old. The research participants represented a variation in levels of education between a bachelor's degree and a master's degree. Table 1 contains a breakdown of research participant demographics.

The characteristics of research participants represented the positions held by participants that involve the use of hedging. These positions are responsible for the decision to purchase jet fuel. These position titles included business analyst, business manager, financial analyst, purchasing manager, chief financial officer, aviation fuel manager, and operations manager.

Table 1

Summary of Research Participant Demographics

Participant	Gender	Highest degree	Position	Age range
Participant 1	Male	BS	Business Analyst	20-30
Participant 2	Female	MBA	Business Analyst	40-50
Participant 3	Male	MBA	Financial Analyst	40-50
Participant 4	Male	BS	Financial Analyst	30-40
Participant 5	Male	MBA	Purchasing Manager	40-50
Participant 6	Male	MBA	Business Manager	40-50
Participant 7	Male	BS	Business Analyst	50-60
Participant 8	Female	MS	Purchasing Manager	40-50
Participant 9	Female	BS	Financial Analyst	30-40
Participant 10	Male	MS	Aviation Fuel Manager	40-50
Participant 11	Male	MBA	Financial Analyst	40-50
Participant 12	Male	BS	Business Analyst	50-60
Participant 13	Male	MBA	Chief Financial Officer	40-50
Participant 14	Male	MBA	Operations Manager	40-50
Participant 15	Male	MBA	Operations Manager	40-50
Participant 16	Male	MS	Business Analyst	40-50
Participant 17	Male	BS	Business Analyst	50-60
Participant 18	Male	MBA	Financial Analyst	60-70
Participant 19	Male	MS	Aviation Fuel Manager	40-50
Participant 20	Male	BS	Financial Analyst	40-50

Data Collection

Following receipt of Walden University Internal Review Board approval (approval # 09-28-16-0365360), I began recruiting research participants through LinkedIn. Outside of my recruitment efforts for participants, LinkedIn had no participation in the study. The only information collected through this organization was participant contact information.

Invitations for participation in this study were sent to 200 potential participants through email. Of the 200 potential research participants contacted, 26 potential research

participants responded. Of the 26 respondents, 20 participants were willing and able to answer interview questions. LinkedIn.com was the source for recruiting 17 research participants. Airline company websites were sources for recruiting three research participants. There were no other public records used for recruiting other research participants.

Hotel conference rooms and over the telephone at my home address were locations for data collection in this study. The hotel conference rooms were off-site locations to collect face-to-face interview data from research participants. The utilization of the telephone at my home address was to collect data from research participants that could not participate in face-to-face interviews. My home address was also the location for the collection of secondary data.

The collection of data from research participants occurred at a frequency of two interviews per day for 10 days. The collection of secondary data occurred at a frequency of every day for 30 days. The duration for the collection of data from each research participant averaged 60 minutes. The duration for the collection of secondary data from U.S. Department of Transportation statistical database, U.S. Department of Energy database, U.S. Securities and Exchange Commission K-10 Reports, and U.S. airlines corporate websites was 30 days.

The interview protocol form guided the researcher in the recording of data collected from research participants through face-to-face interviews (Appendix A). The recording of interview data collected from research participants was by telephone using an audio recording device. Rev (2016) transcription service transcribed the recorded data

and transferred it to the interview protocol form (Appendix B). Microsoft Excel and NVivo (2016) software facilitated the analysis of secondary data collected from U.S. Department of Transportation statistical database, U.S. Department of Energy database, U.S. Securities and Exchange Commission K-10 Reports, and U.S. airlines corporate websites.

Variations in the data collection from the plan presented in Chapter 3 included communication channels for interviews. Most interviews were over the telephone (17), a few were face-to-face (3), and none were over the internet through Skype. There were no other variations in the data collection from the plan presented in Chapter 3.

Data Analysis

The data analysis included interview data collected from research participants using a qualitative thematic analysis. The constant comparison of all transcripts required the coding of transcription data from each interview. Coding of collected data consisted of applying labels to relevant words, phrases, sentences, and sections of the collected participant data. NVivo (2016) coding software helped to keep track of the data gathered from research participants.

The first step in analyzing the collected data was to become familiar with the data by reading the 20 interview transcripts. The second step was the initial coding process where open coding, axial coding, and selective coding were used to assign codes to the responses from interview participants. The third step was to identify and explore additional themes that emerged from the initial coding process. The fourth step was to re-examine all themes and group themes based on the similarity of research participant

responses. The fifth step was applying labels to relevant words, phrases, sentences, and sections of the collected participant data. The sixth step was a review of themes based on their relationships.

In this study, major themes arose based on the high frequency of similar research participant responses to research questions. Subthemes arose based on the lower frequency of similar research participant responses to research questions. High frequency of similar research participant responses to research questions was 30% or higher similar responses. Low frequency of similar research participant responses to research questions was 30% or lower similar responses. Table 2 contains an open coding display of the relationship between the research questions, thematic labels, research participant quotes, codes, and emerged themes.

Table 2

Research Questions and Representative Data Findings

Research question	Thematic label	Research participant quote	Codes	Emergent themes
RQ. When, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices?	Thematic Label 1: When, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices?	Participant 1: "Airline managers choose to hedge mainly to gain a sense of predictability regarding their future expenses, and to remove some of the uncertainty that accompanies market rate fuel prices."	- Sense of predictability - Future expenses - Remove some of the uncertainty - Market rate fuel prices	Predictability of future expenses
RQ1. When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel?	Thematic Label 2: When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel?	Participant 17: "Airline managers are more likely to engage in hedging activity during times of increasing labor costs so that they can at least partially lock in fuel costs."	- Times of increasing labor costs - Lock in fuel costs	Times of lower fuel costs and rising labor costs
RQ2. Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel? (table continues)	Thematic Label 3: Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?	Participant 13: "U.S. financial managers use hedging as a financial tool to reduce exposure to market volatility and the potential rise of fuel costs."	- Reduce exposure to market volatility - Potential rise in fuel costs	Reduce exposure to market price volatility

Research question	Thematic label	Research participant quote	Codes	Emergent themes
RQ3. How could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?	Thematic Label 4: How could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?	Participant 8: "Airline managers would seek to lock in some portion of their jet fuel purchases at a given price. This buffers some of the risk inherent in fuel price fluctuations, while still leaving some potential for an airline to benefit if prices remain stagnant or even decline."	- Lock in some portion of jet fuel purchases - Risk inherent in fuel price fluctuations - Potential for airline to benefit - Price remain stagnant or even decline	Lock in prices through contracts

Research participants in a Business Analyst position within the U.S. airline industry frequently mentioned "predictability of future expenses" in interviews. The "times of lower fuel costs and rising labor costs" emerged as a theme frequently mentioned by research participants who held a Business Analyst position. "Reduce exposure to market price volatility" emerged as a theme mentioned by the research participant in the position of Chief Financial Officer. "Lock in prices through contracts" emerged as a theme frequently mentioned by research participants who held a Purchasing Manager position.

Evidence of Trustworthiness

Credibility

As stated in Chapter 3, the internal qualitative validity established credibility through the display of data and data saturation. The demonstration of data enhanced qualitative validity through the convergence of information from interview data and the secondary data collected from U.S. Department of Transportation statistical database, U.S. Department of Energy database, U.S. Securities and Exchange Commission K-10 Reports, and U.S. airlines corporate websites.

Transferability

As stated in Chapter 3, data gathered from research participant interviews and secondary data sources provided was rich in descriptive detail. There were complete and unaltered interview findings presented in this study. The findings presented in this study are related to the original research questions. Future scholars may reference the results presented in this study for future research on the topic of jet fuel hedging.

Dependability

As stated in Chapter 3, dependability in this study included the development of an audit trail document consisting of a full account of research decisions and activities made throughout the study. The audit trails document provided external parties with the ability to audit decisions and processes on the completion of the study to confirm research findings (Carcary, 2009). The audit trail document included a log of all research activities, memos, research journal, and data collection processes throughout the study (Carcary, 2009).

Confirmability

As stated in Chapter 3, confirmability in the study is a reflexivity tool where I continually engaged in the process of self-reflection to become more aware of my actions while conducting this study (Darawsheh & Stanley, 2014). The use of the reflexivity tool facilitated an examination of my thoughts, actions, assumptions, and expectations (Darawsheh & Stanley, 2014). The utilization of the reflexivity tool guided the research process and helped to limit bias in the collection of data from research participants.

Study Results

RQ. When, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices?

Predictability of future expenses was the major theme based on the research question of when, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices. Most research participants described the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices as a good indicator to predict future expenses. This major theme occurred 12 times, or with 60% of the total sample population. Table 3 contains the major theme and subthemes that address the first research question.

Table 3

Factors Related to the Central Research Question

Research Question Components	Themes	Number of Occurrences	Percentage of Occurrences
When U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices?	Predictability of future expenses	12	60%
Why U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices?	Protect against a climb in fuel prices	10	50%
How U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices?	Align with the overall strategy of the business	7	35%

Protect against a climb in fuel prices was the first subtheme that relates to the why component in answering the research question of when, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices. This sub-theme occurred 10 times, or with 50% of the total number of research participants. The findings within this subtheme identify with when, why and how U.S. airline financial managers consider the

use of hedging. When the price of jet fuel spikes, there is a consideration for the use of hedging. Why U.S. airline financial managers consider the use of hedging is to protect the airline from a climb in jet fuel prices. How U.S. airline financial managers consider the use of hedging is to use derivatives for the purchase of jet fuel before the expected climb in jet fuel prices.

Align with the overall strategy of the business was the second subtheme in answering the research question of when, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices that relates to the how component. This subtheme occurred seven times, or with 35% of the total number of research participants. When there is an anticipated spike in jet fuel prices, U.S. airline financial managers consider the use of hedging as hedging aligns with the airline's overall business strategy. Why U.S. airline financial managers consider the use of hedging is to protect the airline against spikes in jet fuel prices in alignment with the overall business strategy. How U.S. airline financial managers consider the use of hedging is to implement hedging to purchase jet fuel in alignment with the overall business strategy.

RQ1. When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel?

Times of lower fuel costs and rising labor costs was the major theme based on the research question of when would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel. This major

theme occurred 16 times, or with 80% of the total sample population. Table 4 contains the major theme and subtheme that address the second research question.

Table 4

Factors Related to Research Question 1

Research Question	Themes	Number of Occurrences	Percentage of Occurrences
When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel?	Times of lower fuel costs and rising labor costs	16	80%
When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel?	Considers the use of hedging on a quarter by quarter basis	15	75%

Note. Population size is 20 participants.

Considers the use of hedging on a quarter by quarter basis was the first subtheme in answering the research question of when would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel. This subtheme occurred 15 times, or with 75% of the total number of research participants. U.S. airline financial managers consider the use of hedging on a quarterly basis as the price of jet fuel fluctuates every quarter. Three research participants

mentioned the airline company they work for considers the use of hedging every six months. One research participant mentioned the airline company they work for considers the use of hedging once per year. As noted in Table 4, 15 participants mentioned the airline company they work for considers the use of hedging every quarter.

Per Southwest Airline's 2015 10-K report (Southwest Airlines Co., 2016, p. 6), "the company continually monitors and adjusts its fuel hedge portfolio and strategies to address not only fuel price increases, but also fuel price volatility, hedge costs, and hedge collateral requirements." This statement on Southwest Airline's 2015 10-K report relates to statements made by research participants that work at Southwest Airlines. Four research participants that work for Southwest Airlines mentioned the finance department considers the use of hedging on a quarterly basis.

RQ2. Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

Reduce exposure to market price volatility was the major theme based on the research question of why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. This major theme occurred 18 times, or with 90% of the total sample population. Table 5 contains the major theme and subthemes that address the second research question.

Table 5

Factors Related to Research Question 2

Research Question	Themes	Number of Occurrences	Percentage of Occurrences
Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?	Reduce exposure to market price volatility	18	90%
Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?	U.S. airline financial managers use hedging as a financial tool to reduce exposure to the potential rise in fuel costs	16	80%
Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?	The decision to use hedging as a financial tool to mitigate risk is a decision commonly made at the top of the organizational chart by board members	10	50%

Note. Population size is 20 participants.

U.S. airline financial managers use hedging as a financial tool to reduce exposure to the potential rise in fuel costs was the first subtheme in answering the research question of why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. This subtheme occurred 16 times, or with 80% of the total sample population. U.S. airline financial managers use hedging to reduce the potential of paying more for jet fuel in the potential rise of jet fuel cost using hedging. Research participants from United Airlines, Hawaiian Airlines, and Southwest Airlines

mentioned their airline companies implement the use of hedging with the expectation or a rise in jet fuel prices.

Per Southwest Airline's 2015 10-K report (Southwest Airlines Co., 2016, p. 20), "the company's business can be significantly impacted by high and volatile fuel prices. The company's operations are subject to disruption in the event of any delayed supply of fuel. Therefore, the company's strategic plans and future profitability are likely to be impacted by the company's ability to effectively address fuel price increases and fuel price volatility and availability." These statements in the Southwest Airlines 10-K report align with statements made by research participants working for Southwest Airlines.

Per United Airline's 2015 10-K report (United Continental Holdings, Inc., 2016, p. 15), "the company hedges a portion of its future fuel requirements to protect against increases in the price of fuel." Research participants that worked for United Airlines mentioned the decision to use hedging does not cover all jet fuel purchases. Leaving a portion of jet fuel purchases unhedged benefits the airline if the price of jet fuel declined after the implementation of hedging.

The decision to use hedging as a financial tool to mitigate risk is a decision commonly made at the top of the organizational chart by board members was the second subtheme in answering the research question of why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. This subtheme occurred ten times, or with 50% of the total sample population.

Research participants who worked for American Airlines stated: "the decision to use hedging as a financial tool to mitigate risk is a decision commonly made at the top of

the organizational chart by board members." The research participants at American Airlines also mentioned the airline does not currently use hedging and does not have any plans to use hedging again in the future. Per American Airlines 2015 10-K report, "we did not have any fuel hedging contracts outstanding to hedge our fuel consumption. As such, and assuming we do not enter any future transactions to hedge our fuel consumption, we will continue to be fully exposed to fluctuations in fuel prices (American Airlines Group Inc., 2016, p. 18)." The research participants from American Airlines also mentioned the airline was active in using hedging before the merger with U.S. Airways and stopped the practice after the merger was complete. These statements on the Form 10-K supports statements made by research participants at American Airlines.

RQ3. How could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

Lock in prices through contracts was the major theme based on the research question of how could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. This major theme occurred 17 times, or with 85% of the total sample population. Table 6 contains the major theme and subthemes that address the second research question.

Table 6

Factors Related to Research Question 3

Research Question	Themes	Number of Occurrences	Percentage of Occurrences
How could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?	Lock in prices through contracts	17	85%
How could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?	Identifying alternative mitigation strategies	15	75%
How could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?	Over-the-counter derivatives	10	50%

Note. Population size is 20 participants.

Identifying alternative mitigation strategies was the first subtheme in answering the research question of how could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. This subtheme occurred 15 times, or with 75% of the total sample population. Research participants who worked for United Airlines stated “three-way collars” is the optimal choice for the company to hedge jet fuel. Of the 20 research participants, 75% stated “identifying alternative mitigation strategies” was important for determining the use of hedging. Research participants who worked for Delta Airlines indicated “Delta Airlines purchased their oil refinery” to control the cost of their jet fuel purchases. The 2015 10-K report for Delta Airlines supports the research

participants claim that the airline purchased their oil refinery (Delta Air Lines, Inc., 2016).

Over-the-counter derivatives was the second subtheme in answering the research question of how could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. This subtheme occurred ten times, or with 50% of the total sample population. Per the 10-K report for Southwest Airlines (Southwest Airlines Co., 2016, p. 5), "the company enters into fuel derivative contracts to manage its risk associated with significant increases in fuel prices." Three research participants that work for Southwest Airlines mentioned over-the-counter derivatives is the most effective hedging program for the airline company.

A Grounded Theory of Jet Fuel Price Hedging Utilization

This grounded theory qualitative study led to the development of a theory of jet fuel hedging utilization in the U.S. airline industry in times of lower jet fuel prices. Predictability of future expenses, the protection against a climb in jet fuel prices, and the alignment with the overall strategy of the business were the elements in the development of the theory of jet fuel hedging utilization in times of lower jet fuel prices. Figure 1 shows the elements of the theory and how they interrelate to explain jet fuel hedging in times of low fuel prices.

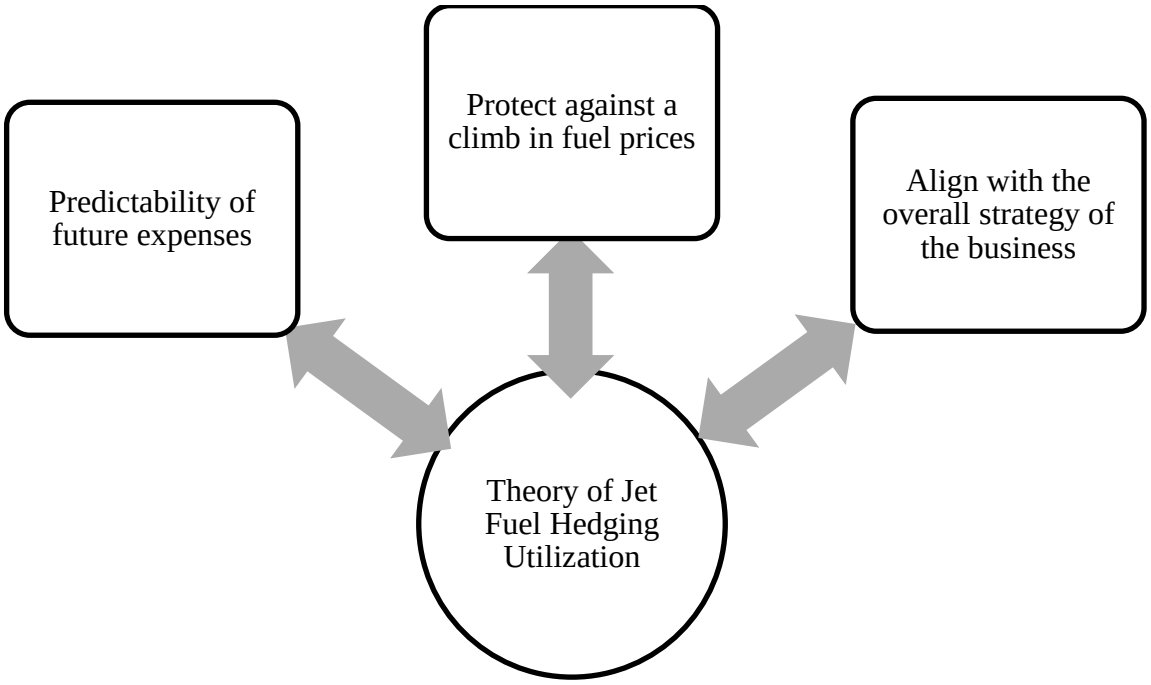

Figure 1. Theory of jet fuel hedging utilization.

Jet fuel hedging utilization in times of lower jet fuel prices involves the protection against a climb in jet fuel prices, and the alignment with the overall strategy of the business. In times of lower jet fuel prices, airline companies seek to predict future expenses. Using jet fuel hedging, airline companies can predict future expenses because the cost of jet fuel is locked in with futures contracts. U.S. airline financial managers use hedging at times of lower jet fuel prices to protect against a climb in jet fuel prices. Jet fuel hedging utilization occurs in times of lower jet fuel prices if jet fuel hedging aligns with the overall strategy of the business.

Summary

There were major themes and subthemes in each research question that emerged from the data collected from research participants. The overarching research question is

when, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices. Themes that emerged from this research question were about the predictability of future expenses, protection against a climb in fuel prices, and how hedging aligns with the overall strategy of the business. The first research question was when would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel. Themes that emerged from this research question were times of lower fuel costs and rising labor costs and the consideration for the use of hedging on a quarter by quarter basis. The second research question was why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. Themes that emerged from this research question were reduce exposure to market price volatility, U.S. financial managers use hedging as a financial tool to reduce exposure to the potential rise in fuel costs, and the decision to use hedging as a financial tool to mitigate risk is a decision commonly made at the top of the organizational chart by board members. The third research question was how could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. Themes that emerged from this research question were locking in jet fuel prices through contracts, identifying alternative mitigation strategies, and the use of over-the-counter derivatives for hedging jet fuel. Chapter 5 contains an interpretation of the findings, a discussion on research limitations, recommendations for future research, implications for positive social change, and conclusions.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this study was to explore the use of hedging as a financial tool for U.S. airline financial managers as a viable option to reduce the risk of exposure from the volatility of jet fuel prices at a time of low jet fuel prices. Grounded theory was the most viable option for this study because the design allows for the constructivist point of view, where the basis for the construction of concepts and theories are on insights gained from participants' insights into lived experiences (Corbin & Strauss, 2015). Grounded theory research approach was the best selection for this study because grounded theory closely aligns with the research questions and enables the development of new theories. The target population for this qualitative study was U.S. airline financial managers. Results of the study may provide insight into how airline financial decision makers explored the use of hedging to mitigate the risk of jet fuel price volatility at a time of lower jet fuel prices.

The hedging of jet fuel at times of increasing jet fuel prices to mitigate exposure to volatile market conditions using purchase strategies such as over-the-counter derivatives were key findings of the study. Participants said they consider using hedging on a regular basis in alignment with their airline's operational strategy. The use of hedging is to protect the airline against spikes in jet fuel prices on the open market. U.S. airline financial managers use hedging through over-the-counter derivatives purchasing strategies.

Interpretation of Findings

General RQ. When, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices?

Predictability of future expenses was the major theme based on the research question of when, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices. This finding of the predictability of future expenses concurred with findings of Adrangi et al. (2014) and Morrell and Swan (2006) about airline companies' ability to manage future expenses by using hedging. Research participants also stated that they begin considering the use of hedging when identified trends predict a rise in jet fuel prices soon.

Protect against a climb in fuel prices was the first subtheme based on the research question of when, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices. Hedging is used at times of lower jet fuel prices to lock in prices at lower prices to protect the airline from exposure to jet fuel price volatility. Research participants mentioned, locking in jet fuel prices for a specific quantity, for a specific amount of time, as a specific price will protect the airline against a climb in fuel prices. It is important to note that the idea is to lock in jet fuel prices at the lowest allowable price dependent on the lowest price allowed by the suppliers.

Align with the overall strategy of the business was the second subtheme based on the research question of when, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices. Align with the overall strategy of the business supported the findings of Adrangi et al. (2014) and Morrell and Swan (2006) on the relationship between the use of hedging and fluctuating fuel prices. Research participants from Southwest Airlines, Hawaiian Airlines, and JetBlue Airlines agreed with Adrangi et al. (2014) and Morrell and Swan (2006) on the relationship between hedging and fluctuating jet fuel prices.

Alignment with the strategy of the airline also involves cash flows. Research participants from Southwest Airlines, Allegiant Airlines, Hawaiian Airlines, and Alaska Airlines agreed with Armen (2013) and Zarb (2014) that cash flows are important to consider when an airline is considering the purchase of jet fuel. One research participant stated that "maintaining positive cash flow is critical for an airline to maintain positive operations."

RQ1. When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel?

Times of lower fuel costs and rising labor costs was the major theme based on the research question of when would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel. Brooks (2012) and Anderson and Lillis (2011) agreed with research participants in this study that the ideal time to use hedging is during times of economic downturn and lower jet fuel costs.

Participants at Southwest Airlines reported using hedging strategies to mitigate the risk at times of high and low of jet fuel prices. Per Brooks (2012), managers at Southwest Airlines reduced their net fuel hedge position when the cost of jet fuel declined. Research participants agreed with Brooks (2012) that the amount of fuel they hedged was lower at times of lower prices.

Considers the use of hedging on a quarter by quarter basis was the first subtheme in answering the research question of when would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel. Research participants agreed with Tarry (2015) on the importance of reevaluating the hedging position on a quarterly basis. Because of the fluctuation of jet fuel prices, there is an emphasis on the need to consider the use of hedging every quarter (Tarry, 2015).

RQ2. Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

Reduce exposure to market price volatility was the major theme based on the research question of why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. Research participants and authors Treanor et al. (2014) agree that U.S. airline financial managers use hedging to reduce exposure to volatility in jet fuel prices.

Protect against the potential rise in fuel costs was the first subtheme in answering the research question of why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. Research participants agree with

authors Gerner and Ronn (2013) on using hedging as a financial tool in the purchase of jet fuel to protect the airline from additional fuel expenses.

The decision to use hedging as a financial tool to mitigate risk is a decision commonly made at the top of the organizational chart by board members was the second subtheme in answering the research question of why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. Research participants agree with authors Naumann and Suhl (2012) the volatile price of jet fuel on the open market has a significant impact on airline strategy and decision making by the board members.

RQ3. How could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

Lock in prices through contracts was the major theme based on the research question of how could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. Author Martin (2015) and research participants agree that when an airline uses hedging, the airline enters contract pricing for jet fuel purchases to lock in prices.

Identifying alternative mitigation strategies was the first subtheme in answering the research question of how could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. Treanor et al. (2014) agreed with Aïd, Campi, and Langrené (2013) and with Carter, Rogers, and Simkins (2006) and research participants on the use of hedging strategies for airlines to reduce risk in the purchase of jet fuel by using operational and financial hedging strategies.

Over-the-counter derivatives were the second subtheme in answering the research question of how could U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel. Brooks (2012), Simmons (2015), and Morrell and Swan (2006) agreed with Gerner and Ronn (2013) and research participants that airline companies use over the counter derivatives to base the price of jet fuel in a hedging contract.

Limitations of the Study

Limitations mentioned in Chapter 1 were hedging only works with futures contracts because the purpose of hedging tool is to mitigate the risk of fluctuating jet fuel prices. Hence, the financial information and jet fuel pricing data used in the study included only futures contracts because the study primarily involved the use and practice of hedging as a financial tool.

Limitations of this study included the recruitment of participants. The original participant recruitment plan was to recruit potential research participants from professional membership organizations, LnkedIn.com, and other public sources. This original recruitment plan became a limitation because the original membership organizations would not agree to become research partners. Thus, the recruitment of research participants became limited to LinkedIn.com and public sources.

Also, limitations of this study included the number of participants in comparison to the number of invited participants. The number of respondents to participate in the study became a limitation. Of the 200 invitations that went to potential participants, only

26 individuals responded. Of the 26 respondents, only 20 were qualified and willing and able to participate in the study.

Recommendations

This study came about from a recommendation for additional research on the topic of jet fuel hedging. Before this study, no known qualitative studies explored the use of hedging from the perspective of U.S. airline financial managers. There is a need for additional research on the topic of jet fuel hedging around the world.

The aviation field can benefit from additional research on the topic of jet fuel hedging from the perspective of financial managers in other nations around the world. The aviation industry is a global industry with passenger and cargo air transportation around the world. Other airlines on other continents such as Asia and Europe also engage in hedging jet fuel (Berghöfer & Lucey, 2014). Understanding the perspectives of airline managers in other nations around the world may benefit the global economy. There is additional research needed on the topic of the global hedging of jet fuel.

With this recommendation to include international airlines and domestic airlines in other nations, the recommendation extends to additional personnel within the industry. In addition to financial personnel in the airline industry, additional research may include operational personnel to understand the perspectives of jet fuel hedging holistically. Personnel outside of the finance department may have additional perspectives on the use of jet fuel hedging.

In addition to the perceptions of financial and operational personnel within the airline industry, the perspectives from the traveling public may also add to the existing

body of knowledge. Gaining insight from the traveling public could yield a change in hedging strategies. Understanding the customers may have an impact on the operational strategy of airlines.

In addition to passenger air transportation, hedging jet fuel is a common practice for cargo transportation carriers (Berghöfer & Lucey, 2014). Understanding when, why, and how cargo airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel would be beneficial for the airline industry. The results of this study can serve as a foundation for additional research on jet fuel hedging in the air cargo transportation area.

Another recommendation for future research is on the topic of fuel hedging in maritime shipping. Fuel is the largest expense in maritime shipping and shippers are continually seeking to save on fuel expenses (Wang & Teo, 2013). Global trade can benefit from this research whereas maritime shipping involves shipping goods across the world. The industry can benefit by understanding when, why, and how maritime shipping financial managers use hedging as a financial tool to mitigate risk in the purchase of fuel. Consumers of international goods can benefit from a potential reduction in prices for goods when maritime shipping companies use hedging in the purchase of fuel.

In addition to maritime shipping, passenger cruise lines may also benefit from hedging fuel expenses. The cruise line industry is a global business transporting passengers around the world by sea. Fuel is one of the largest expenses in the cruise line industry (Chang, Lee, & Park, 2017). The industry can benefit by understanding when, why, and how cruise line financial managers use hedging as a financial tool to mitigate

risk in the purchase of fuel. Cruise line passengers can also benefit from this study whereas when the cruise line company uses hedging to purchase fuel the potential savings could be passed along to the customers.

Another recommendation for future research is on the topic of fuel hedging in the rail industry. Regional and rail companies that carry passengers and cargo may benefit from hedging fuel. Benefits from research on this topic may be savings passed along to rail passengers, cargo customers, and reinvestment opportunities to improve rail infrastructure.

Additional research may also include the use of hedging as a financial tool to mitigate risk in the purchase of jet fuel from the perspective of oil and fuel supply companies. Oil companies may have different perspectives on the use of hedging because the oil companies may be sacrificing higher profit margins because their customers use hedging. It may be beneficial to the oil companies and the oil company customers to understand when, why, and how oil companies may allow customers to hedge the purchase of jet fuel.

Implications

The implications for positive social change because of this study is an impact that affects individuals, groups, organizations, contributions to local economies, contributions to the national economy, and policy. Positive social change implications that impact individuals include but are not limited to the creation of new jobs and the potential for increased wages through savings in jet fuel expenses. With an average of 54,415,638 revenue passenger miles in the United States from June 2015 to June 2016, there is a

potential for additional jobs given a similar projection for the next twelve months (Bureau of Transportation Statistics, 2016). As of August 2016, the U.S. airline industry accounts for 567,625 full-time employees and 113,514 part-time employees (Bureau of Transportation Statistics, 2016). These numbers of employees include both major and sub-operator airline data. In addition to the creation of new jobs, there is potential for increased wages year over year for all U.S. airline company employees (Massachusetts Institute of Technology, 2016).

Positive social change implications that impact groups include but are not limited to airline internal stakeholders such as employees, external stakeholders such as the public, and investors. The positive social change implication on airline employees could be increased wages, improved benefits, and additional employees because of the airline saving revenue because of the use of hedging. Wages for employees outside of labor unions expect to see standard wage increases over the next ten years (Federal Aviation Administration, 2014). The savings from jet fuel hedging may also contribute to additional wages, improved benefits, and additional employees.

Positive social change implications that impact organizations include but are not limited to third party organizations that supply the airline company with goods and services, employee unions, and aircraft facilities such as airports. Organizations that supply the airline companies with goods and services such as deicing services, food and beverage for onboard services and airport gate service providers could benefit from the airline saving on jet fuel prices through airline investment into improved services. Employee unions can take advantage of the cost savings from the purchase of jet fuel

through the airline re-investment into increased employee wages and improved employee benefits. Aircraft facilities such as airports benefit from additional investments from the airline companies to improve facility conditions because of savings on jet fuel expenses using hedging.

Local economies affected by positive social change implications include but are not limited to direct and indirect commerce, taxes, infrastructure investments, and jobs (Airlines for America, 2016). Direct economic contributions in the U.S. airline industry to local economies come from air transportation and supporting services, aircraft, aircraft engines, parts manufacturing, travel, and other trip-related expenses by travelers using air transportation (Federal Aviation Administration, 2014). Indirect economic contributions in the U.S. airline industry to local economies come from local spending by supporting businesses and other entities, local spending by direct and indirect employees, direct and indirect sales, and payroll (Federal Aviation Administration, 2014). These economic contributions increase from the savings on jet fuel expenses where there is a reinvestment of savings into the airline.

Positive social change implications that impact the national economy include but are not limited to job creation, contributions to the Gross Domestic Product (GDP), and connecting local economies to form the national economy. The U.S. airline industry contributes to the national economy by employing nearly 11 million employees in the United States (Airlines for America, 2016). The U.S. airline industry contributes nearly $1.5 trillion dollars to the Gross Domestic Product (GDP) in economic activity (Airlines for America, 2016). The U.S. airline industry contributes to the national economy by

connecting local economies through 28,537 daily flights (United States Department of Transportation, 2015).

Managing social risks and impacts through risk management policy in jet fuel volatility, a higher level of financial stability and further economic growth can emerge, creating new employment opportunities. These factors contribute to positive social change. These jobs drive positive social change in the economy because the wages from these jobs have a positive impact on employees and their families. Risk management policy in U.S. airline companies provide stabilization to airline expenses and contribute to positive social change in the economy.

Simkowitz (1972) developed modern financial theory to explanation debt policy, dividend policy, and investment policy to assist decision makers in their ability to make financial decisions. The positive social impact of the debt policy of this theory is on the U.S. airlines that receive is residual benefits from their lenders and stockholders. The application of Simkowitz's (1972) debt policy within modern financial theory to this study is significant for the purchase of jet fuel.

The dividend policy within Simkowitz's (1972) modern financial theory has a positive social impact whereas the airline's bottom-line profits earned in a specific amount of time is distributed to stakeholders. Simkowitz's (1972) investment policy within modern financial theory has a positive social impact whereas the savings using hedging in the purchase of jet fuel is re-invested back into the airline company. Re-investments contribute to positive social change through improved employee wages,

benefits, and overall economic improvement through additional economic contributions such as the purchase of new aircraft.

Recommendations for the U.S. airline industry to promote positive social change include the reinvestment of funds saved from the use of hedging in the purchase of jet fuel. There should be a reinvestment of funds saved from the use of hedging in labor, equipment, infrastructure, and other improvements. These improvements will improve the overall condition of the airline and employee relations.

Conclusions

The purpose of this study was to explore the use of financial hedging as a financial tool for top managers within the U.S. airline industry as a viable option to reduce the risk of exposure from the volatility of jet fuel prices at a time of low jet fuel prices. There were 20 research participants selected for this study based on the number of airline companies currently operating in the United States. These participants provided insights through their perspectives on the use of hedging as a financial tool in the purchase of jet fuel in the U.S. airline industry. Key findings of the study were jet fuel is hedged at times of increasing jet fuel prices to mitigate exposure to volatile market conditions using purchase strategies such as over-the-counter derivatives. The implications for positive social change because of this study is an impact that affects individuals, groups, organizations, contributions to local economies, contributions to the national economy, and policy. There is a need for additional research on the topic of jet fuel hedging around the world.

References

Adrangi, B., Gritta, R., & Raffiee, K. (2014, December). Dynamic interdependence in jet fuel prices and air carrier revenues. *Atlantic Economic Journal, 42*(4), 473-474. doi:10.1007/s11293-013-9388-9

Aïd, R., Campi, L., & Langrené, N. (2013). A structural risk-neutral model for pricing and hedging power derivatives. *Mathematical Finance, 23*(3), 387-438. doi:10.1111/j.1467-9965.2011.00507.x

Airlines for America. (2016). *Airlines for America*. Retrieved from http://airlines.org/data/

American Airlines Group Inc. (2016, February 24). *Form 10-K 2015*. Retrieved from https://www.sec.gov/Archives/edgar/data/4515/000119312516474605/d78287d10k.htm

Anderson, S., & Lillis, A. (2011). Corporate frugality: Theory, measurement, and practice. *Contemporary Accounting Research, 28*(4), 1349-1387. doi:10.1111/j.1911-3846.2011.01107.x

Anderson, S., & Lillis, A. (2011). Corporate frugality: Theory, measurement, and practice. *Contemporary Accounting Research, 28*(4), 1349-1387. doi:10.1111/j.1911-3846.2011.01107.x

Armen, S. (2013). Performance assessment of major U.S. airlines via cash flow ratios. *Annals of The University of Oradea, Economic Science Series*, 398-408. Retrieved from http://anale.steconomiceuoradea.ro/en/

Arslan, A. M., Frenk, J. B., & Sezer, S. (2015). On the single-leg airline revenue management problem in continuous time. *Mathematical Methods of Operations Research, 81*(1), 27-52. doi:10.1007/s00186-014-0485-6

Atuahene, I., Corda, S., & Sawhney, R. (2011). Development and flight test of a real-time energy management display. *Aviation, 15*(4), 83-91. doi:10.3846/16487788.2011.648310

Bachman, J. (2014, June 2). *An old-fashioned airfare war in Seattle*. Retrieved from http://www.bloomberg.com/bw/articles/2014-06-02/delta-vs-dot-alaska-air-an-old-fashioned-airfare-war-engulfs-seattle-seattle-tacoma-airport

Bateman, C. R., & Westphal, A. D. (2011). Investigating the presence of transfer pricing and its impact in U.S. airline mergers. *Academy of Marketing Studies Journal, 15*(1), 45-60. Retrieved from http://www.alliedacademies.org/affiliate-academies-ams.php

Bazargan, M., Lange, D., Tran, L., & Zhou, Z. (2013). A simulation approach to airline cost benefit analysis. *Journal of Management Policy and Practice, 14*(2), 54-61. Retrieved from http://www.na-businesspress.com/jmppopen.html

Belobaba, P. P., & Jain, H. (2013). Alliance revenue management in practice: Impacts of bid price sharing and dynamic valuation. *Journal of Revenue and Pricing Management, 12*(6), 475-488. doi:10.1057/rpm.2013.17

Benmelech, E., Bergman, N., & Enriquez, R. (2012). Negotiating with labor under financial distress. *Review of Corporate Finance Studies, 1*(1), 28-67. doi:10.3386/w17192

Berghöfer, B., & Lucey, B. (2014). Fuel hedging, operational hedging and risk exposure - Evidence from the global airline industry. *International Review of Financial Analysis, 34*(1), 124–139. doi:10.1016/j.irfa.2014.02.007

Bilotkach, V. (2011). Multimarket contact and intensity of competition: Evidence from an airline merger. *Review of Industrial Organization, 38*(1), 95-115. doi:10.1007/s11151-010-9274-4

Bolte, T. (2014). The merger of American Airlines and U.S. Airways. *Review of Banking & Financial Law, 33*(2), 494-503. Retrieved from http://www.bu.edu/rbfl/

Borenstein, S. (2011). Why can't US airlines make money? *American Economic Review, 101*(3), 233-237. doi:10.1257/aer.101.3.233

Bougette, P., Hüschelrath, K., & Müller, K. (2014). Do horizontal mergers induce entry? Evidence from the US airline industry. *Applied Economics Letters, 21*(1), 31-34. doi:10.1080/13504851.2013.835473

Brady, S. (2012). Civil reserve air fleet: The impact of 9/11/2001. *Journal of Transportation Law, Logistics & Policy, 79*(2), 163-191. Retrieved from http://www.atlp.org

Brooks, R. (2012). A life cycle view of enterprise risk management: The case of Southwest Airlines jet fuel hedging. *Journal of Financial Education, 38*(3/4), 33-45. doi:10.2139/ssrn.1554971

Brown, J. (2014). Jimmy Carter, Alfred Kahn, and airline deregulation: Anatomy of a policy success. *The Independent Review, 19*(1), 85-99. Retrieved from http://www.independent.org/publications/tir/

Bureau of Transportation Statistics. (2016, August 31). *Search Airline Employment Data by Month*. Retrieved from http://www.transtats.bts.gov/Employment/

Bureau of Transportation Statistics. (2016, July 1). *United States Department of Transportation*. Retrieved from http://www.rita.dot.gov/bts/acts/customized/table?adfy=2015&adfm=6&adty=2016&adtm=6&aos=1&artd=1&arti&arts&asts&astns&astt=3&ascc&ascp=1

Button, K. (2015). A book, the application, and the outcomes: How right was Alfred Kahn in the economics of regulation about the effects of the deregulation of the US domestic airline market? *History of Political Economy, 47*(1), 1-39. doi:10.1215/00182702-2847303

Campello, M., Lin, C., Ma, Y., & Zou, H. (2011). The real and financial implications of corporate hedging. *Journal of Finance, 66*(5), 1615-1647. doi:10.1111/j.1540-6261.2011.01683.x

Cannon, J. (2014). Determinants of "sticky costs": An analysis of cost behavior using United States air transportation industry data. *The Accounting Review, 89*(5), 1645-1672. doi:10.2308/accr-50806

Carcary, M. (2009). The research audit trial-enhancing trustworthiness in qualitative inquiry. *Electronic Journal of Business Research Methods*, *7*(1), 11-23. Retrieved from www.ejbrm.com

Carter, D., Rogers, D., & Simkins, B. (2006). Hedging and value in the U.S. airline industry. *Journal of Applied Corporate Finance, 21*(4), 21-33. doi:doi:10.1111/j.1745-6622.2006.00107.x

Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum, 41*(5), 545-547. doi:10.1188/14.ONF.545-547

Chan, M. (2014). Politics in the American Airlines--U.S Airways merger and antitrust settlement. *Fordham Journal of Corporate & Financial Law, 20*(1), 175-201. Retrieved from http://ir.lawnet.fordham.edu/jcfl/

Chang, Y.-T., Lee, S., & Park, H. (2017). Efficiency analysis of major cruise lines. *Tourism Management, 58*(1), 78-88. doi:10.1016/j.tourman.2016.10.012

Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.

Chen, H., & Solak, S. (2015). Lower cost arrivals for airlines: Optimal policies for managing runway operations under optimized profile descent. *Production & Operations Management, 24*(3), 402-420. doi:10.1111/poms.12244

Chen, P.-T., & Hu, H.-H. (2013). The mediating role of relational benefit between service quality and customer loyalty in the airline industry. *Total Quality Management & Business Excellence, 24*(9/10), 1084-1095. doi:10.1080/14783363.2012.661130

Chen, W., Tan, H.-T., & Wang, E. Y. (2013, March). Fair value accounting and managers' hedging decisions. *Journal of Accounting Research, 51*(1), 67-103. doi:10.1111/j.1475-679X.2012.00468.x

Congdon, T. (2014). What were the causes of the great recession? *World Economics, 15*(2), 1-32. doi:http://www.world-economics-journal.com/

Corbin, J., & Strauss, A. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th ed.). Thousand Oaks, CA: Sage.

Darawsheh, W., & Stanley, M. (2014). Promoting rigor, reliability and validity in qualitative research. *International Journal of Therapy & Rehabilitation, 21*(12), 560-568. doi:10.12968/ijtr.2014.21.12.560

Dawson, A. (2015). Labor activism in bankruptcy. *American Bankruptcy Law Journal, 89*(1), 97-131. doi:10.2139/ssrn.2397911

Delta Air Lines, Inc. (2016, February 5). *Form 10-K 2015*. Retrieved from https://www.sec.gov/Archives/edgar/data/27904/000002790416000018/dal12312 01510k.htm

Du, Y., Wang, C., & Du, Y. (2012). Inversion of option prices for implied risk-neutral probability density functions: General theory and its applications to the natural gas market. *Quantitative Finance, 12*(12), 1877-1891. doi:10.1080/14697688.2011.586355

Dunham, L. (2012). Managerial hedging ability and firm risk. *Journal of Economics & Finance, 36*(4), 882-899. doi:10.1007/s12197-010-9160-9

Dunnn, G., & Russell, E. (2015). Oil smooths US profits path. *Airline Business, 31*(2). Retrieved from https://www.flightglobal.com/products/airline-business/

Eaton, A., Rogers, S., Chang, T., & Voos, P. (2014). Choosing union representation: The role of attitudes and emotions. *Industrial Relations Journal, 45*(2), 169-188. doi:10.1111/irj.12056

El Hussein, M., Hirst, S., Salyers, V., & Osuji, J. (2014). Using grounded theory as a method of inquiry: Advantages and disadvantages. *Qualitative Report, 19*(27), 1-10. Retrieved from http://nsuworks.nova.edu/tqr/

Elbert, R. B. (2012). Risk management for air freight forwarders: Analysis of flexible price agreements and financial hedging. *Supply Chain Forum: International Journal, 13*(4), 40-50. doi:10.1002/9781118266403.ch32

Engau, C., Hoffman, V., & Busch, T. (2011). Airlines' flexibility in facing regulatory uncertainty: To anticipate or adapt? *California Management Review, 54*(1), 107-125. Retrieved from http://cmr.berkeley.edu/

Escobari, D., & Lee, J. (2014). Demand uncertainty and capacity utilization in airlines. *Empirical Economics, 47*(1), 1-19. doi:10.1007/s00181-013-0725-2

Evripidou, L. (2012). M&As in the airline industry: Motives and systematic risk. *International Journal of Organizational Analysis, 20*(4), 435-446. doi:10.1108/19348831211268625

Ewing, B. T., & Malik, F. (2010). Estimating volatility persistence in oil prices under structural breaks. *Financial Review, 45*(4), 1011-1023. doi:10.1111/j.1540-6288.2010.00283.x

Federal Aviation Administration. (2014, June 1). *Economic impact report*. Retrieved from https://www.faa.gov/air_traffic/publications/media/2014-economic-impact-report.pdf

Federal Aviation Administration. (2014). *FAA aerospace forecast fiscal year 2016-2036*. Retrieved from http://www.faa.gov/data_research/aviation/aerospace_forecasts/media/appendix_a_alternative_forecast_scenarios.pdf

Financial Accounting Standards Board. (2015). FASB proposes updates to derivatives and hedging accounting. *Journal of Accountancy, 220*(4), 15-16. Retrieved from http://www.journalofaccountancy.com/

Frank, R. H. (2013). Alfred E. Kahn: Regulator and language maven. *Industrial Organization, 42*(2), 191-201. doi:10.1007/s11151-012-9373-5

Frestad, D., & Beisland, L. A. (2015). Hedge effectiveness testing as a screening mechanism for hedge accounting: Does it work? *Journal of Accounting, Auditing & Finance, 30*(1), 35-56. doi:10.1177/0148558X14549457

Fu, X., Oum, T. H., & Zhang, A. (2010). Air transport liberalization and its impacts on airline competition and air passenger traffic. *Transportation Journal, 49*(4), 24-41. Retrieved from http://www.psupress.org/journals/jnls_transportation_journal.html

Fu, Y.-K. (2013). High-performance human resource practices moderate flight attendants' organizational commitment and organizational citizenship behavior. *Social Behavior And Personality, 41*(7), 1195-1208. doi:10.2224/sbp.2013.41.7.1195

Gerner, M., & Ronn, E. I. (2013). Fine-tuning a corporate hedging portfolio: The case of an airline. *Journal of Applied Corporate Finance, 25*(4), 74-86. doi:10.1111/jacf.12044/abstract

Gillespie, W., & Richard, O. M. (2012). Antitrust immunity grants to joint venture agreements: Evidence from international airline alliances. *Antitrust Law Journal, 78*(2), 443-469. Retrieved from

http://www.americanbar.org/groups/antitrust_law/publications/antitrust_law_journal.html

Giroud, X. (2013). Proximity and investment: Evidence from plant-level data. *Quarterly Journal of Economics, 128*(2), 861-915. doi:http://qje.oxfordjournals.org/

Glaser, B. G., & Strauss, A. L. (1967). The discovery of grounded theory: Strategies for qualitative research. Chicago, IL: Aldine Publishing Company.

Goldstein, I., Li, Y., & Yang, L. (2014). Speculation and hedging in segmented markets. *Review of Financial Studies, 27*(3), 881-922. doi:10.2139/ssrn.1712472

Hampson, I., Junor, A., & Gregson, S. (2012). Missing in action: Aircraft maintenance and the recent 'HRM in the airlines' literature. *International Journal of Human Resource Management, 23*(12), 2561-2575. doi:10.1080/09585192.2011.633278

Hannigan, T., Hamilton III, R. D., & Mudambi, R. (2015). Competition and competitiveness in the US airline industry. *Competitiveness Review, 25*(2), 134-155. doi:10.1108/CR-11-2014-0036

Helleloid, D., Seong-Hyun, N., Schultz, P., & Vitton, J. (2015). US airline industry in 2015. *Journal of the International Academy for Case Studies, 21*(5), 113-125. Retrieved from http://www.alliedacademies.org/the-international-academy-for-case-studies/

Huang, L., & Zhang, D. (2015). Hedging or speculation: What can we learn from the volume-return relationship? *Emerging Markets Finance & Trade, 51*(6), 1117-1128. doi:10.1080/1540496X.2015.1080501

Huettinger, M. (2014). What determines the business activities in the airline industry? A theoretical framework. *Baltic Journal of Management, 9*(1), 71-90. doi:10.1108/BJM-04-2013-0053

El Hussein, M. E., Hirst, S., Salyers, V., & Osuji, J. (2014). Using grounded theory as a method of inquiry: Advantages and disadvantages. *The Qualitative Report, 19*(27), 1-15. Retrieved from http://nsuworks.nova.edu/tqr/

Investopedia. (2015). *Available seat miles*. Retrieved from http://www.investopedia.com/terms/a/availableseatmiles.asp

Investopedia. (2015). *Collar*. Retrieved from http://www.investopedia.com/terms/c/collar.asp

Investopedia. (2015). *Commodity*. Retrieved from http://www.investopedia.com/terms/c/commodity.asp

Investopedia. (2015). *Crude oil*. Retrieved from http://www.investopedia.com/terms/c/crude-oil.asp

Investopedia. (2015). *Futures*. Retrieved from http://www.investopedia.com/terms/f/futures.asp

Investopedia. (2015). *Futures contract*. Retrieved from http://www.investopedia.com/terms/f/futurescontract.asp

Investopedia. (2015). *Hedge*. Retrieved from http://www.investopedia.com/terms/h/hedge.asp

Investopedia. (2015). *Option*. Retrieved from http://www.investopedia.com/terms/o/option.asp

Investopedia. (2015). *Price risk*. Retrieved from http://www.investopedia.com/terms/p/pricerisk.asp

Investopedia. (2015). *Revenue passenger mile*. Retrieved from http://www.investopedia.com/terms/r/revenue-passenger-mile-rpm.asp

Investopedia. (2015). *Revenue per available seat mile*. Retrieved from http://www.investopedia.com/terms/r/revenue-per-available-seat-mile-rasm.asp

Investopedia. (2015). *Swap*. Retrieved from http://www.investopedia.com/terms/s/swap.asp

Investopedia. (2015). *Volatility*. Retrieved from http://www.investopedia.com/terms/v/volatility.asp

Iqbal, Z. (2015). CEO age, education, and introduction of hedging in the oil and gas industry. *Journal of Economics & Finance, 39*(1), 189-200. doi:10.1007/s12197-013-9274-y

Jang, S., Choi, K., & Lee, K. (2011). External shocks and efficiency changes in the US airline industry. *Service Industries Journal, 31*(14), 2411-2435. doi:10.1080/02642069.2010.504819

Jolly, P., Reid, J., & Hoanca, B. (2013). A big change at get-you-there air. *Journal of Critical Incidents, 6*(1), 85-88. Retrieved from http://sfcr.org/jci/

Kaufman, B. (2013). Keeping the commitment model in the air during turbulent times: Employee involvement at Delta Air Lines. *Industrial Relations, 52*(1), 343-377. doi:10.1111/irel.12006

Kuancheng, H., & Ko-Chen, C. (2011). A model for airline seat control considering revenue uncertainty and risk. *Journal of Revenue & Pricing Management, 10*(2), 161-171. doi:10.1057/rpm.2009.19

Kumar, P., & Rabinovitch, R. (2013). Ceo entrenchment and corporate hedging: evidence from the oil and gas industry. *Journal of Financial & Quantitative Analysis, 48*(3), 887-917. doi:10.1017/S0022109013000276

Kuo, Y.-H., Leung, J., & Yano, C. (2014). Scheduling of multi-skilled staff across multiple locations. *Production and Operations Management, 23*(4), 626-644. doi:10.1111/poms.12184

Lal, S., Suto, M., & Ungar, M. (2012). Examining the potential of combining the methods of grounded theory and narrative inquiry: A comparative analysis. *Qualitative Report, 17*(41). Retrieved from http://eric.ed.gov

Lapp, M., & Weatherford, L. (2014). Airline network revenue management: Considerations for implementation. *Journal of Revenue and Pricing Management, 13*(2), 83-112. doi:10.1057/rpm.2013.33

LaRoche, M.-A., Gamache, M., & Olivier-Ouellet, J. (2012). Optimization of codeshare flight selection for an airline company. *Information Systems and Operational Research, 50*(1), 31-39. Retrieved from https://www.utpjournals.com/INFOR-Information-Systems-and-Operational-Research.html

Lautier, D., & Raymund, F. (2012). Systemic risk in energy derivative markets: A graph-theory analysis. *The Energy Journal, 33*(3), 215-239. doi:10.5547/01956574.33.3.8

Lawrence, J., & Tar, U. (2013). The use of grounded theory technique as a practical tool for qualitative data collection and analysis. *Electronic Journal of Business Research Methods, 11*(1), 29-40. Retrieved from http://www.ejbrm.com/main.html

Lin, M. H., & Kawasaki, A. (2012). Where to enter in hub-spoke airline networks. *Papers in Regional Science, 91*(2), 419-436. doi:10.1111/j.1435-5957.2011.00386.x

Luo, D. (2014). The price effects of the Delta/Northwest airline merger. *Review of Industrial Organization, 44*(1), 27-48. doi:10.1007/s11151-013-9380-1

Mantin, B., & Wang, J. H. (2012). Determinants of profitability and recovery from system-wide shocks: The case of the airline industry. *Journal of Airline & Airport Management, 2*(1), 1-33. doi:10.3926/jairm.2

Markowitz, H. (1952). Portfolio selection. *Journal of Finance, 7*(1), 77-91. Retrieved from http://www.afajof.org/details/landingpage/2866131/About-the-JF.html

Markowitz, H. (1991). Foundations of portfolio theory. *Journal of Finance, 46*(2), 469-479. doi:10.1111/j.1540-6261.1991.tb02669.x

Martin, H. (2015, January 28). American Airlines' fuel-buying bet pays off in record profit. *The Los Angeles Times*. Retrieved from http://www.latimes.com

Martin, S. (2012). Market structure and market performance. *Review of Industrial Organization, 40*(2), 87-108. doi:10.1007/s11151-012-9338-8

Massachusetts Institute of Technology. (2016, June 1). *Average annual wages and salaries - all employees*. Retrieved from MIT Global Airline Industry Program

Airline Data Project: http://web.mit.edu/airlinedata/www/2015%2012%20Month%20Documents/Employees%20and%20Compensation/Total/Average%20Annual%20Wages%20and%20Salaries%20-%20All%20Employees.htm

McDonnel, G. (2015). What caused airline deregulation: Economists or economics? *Independent Review, 19*(3), 379-395. Retrieved from http://www.independent.org/publications/tir/

Mehta, A., Nevo, A., & Richard, O. (2014). The year in review: Economics at the antitrust division 2013-2014. *Review of Industrial Organization, 45*(4), 379-397. doi:10.1007/s11151-014-9442-z

Mello, A., & Parsons, J. (2013). Margins, liquidity, and the cost of hedging. *Journal of Applied Corporate Finance, 25*(1), 34-44. doi:10.1111/j.1745-6622.2013.12004.x

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco, CA: Jossey-Bass.

Microsoft. (2016). Skype. Retrieved from Skype: https://www.skype.com/en/

Morgenstern, O., & Neumann, J. v. (1976). The collaboration between Oskar Morgenstern and John von Neumann on the theory of games. *Journal of Economic Literature, 14*(3), 805-816. Retrieved from https://www.aeaweb.org/jel/index.php

Morrell, P., & Swan, W. (2006). Airline jet fuel hedging: Theory and practice. *Transport Reviews, 26*(6), 713-730. doi:10.1080/01441640600679524

Murakami, H. (2013). Dynamic effect of low-cost entry on the conduct parameter: An early-stage analysis of Southwest Airlines and America West Airlines. *Modern Economy, 4*(4), 281-292. Retrieved from http://www.scirp.org/journal/me/

Nandha, M., Brooks, R., & Faff, R. (2013). Oil, oil volatility, and airline stocks: A global analysis. *Accounting & Management Information Systems/Contabilitate si Informatica de Gestiune, 12*(2), 302-318. Retrieved from http://www.cig.ase.ro/revista_cig/

Naumann, M., & Suhl, L. (2012). How does fuel price uncertainty affect strategic airline planning? *Operational Research, 13*(3), 343-362. doi:10.1007/s12351-012-0131-0

Neto, J., Smith, M., & Pedersen, D. (2014). E-learning in multicultural environments: An analysis of online flight attendant training. *British Journal of Educational Technology, 45*(6), 1060-1068. doi:10.1111/bjet.12180

Neumann, J., & Morgenstern, O. (1944). *Theory of games and economic behavior* (1st ed.). Princeton, NJ: Princeton University Press. Retrieved from http://press.princeton.edu/titles/7802.html

Ngai, C., & Dastin, J. (2014, December 23). *U.S. airlines confront cheap oil's flip side: costly hedges*. Retrieved from http://www.reuters.com/article/2014/12/23/us-oil-hedging-airlines-idUSKBN0K10AJ20141223

O'Neal, J. W., Jacob, M. S., Farmer, A. K., & Martin, K. G. (2007). Development of a codeshare flight-profitability system at Delta Airlines. *Interfaces, 37*(5), 436-444. Retrieved from http://pubsonline.informs.org/journal/inte

Power, G., Vedenov, D., Anderson, D., & Klose, S. (2013). Market volatility and the dynamic hedging of multi-commodity price risk. *Applied Economics, 45*(27), 3891-3903. doi:10.1080/00036846.2012.736942

QSR International. (2016). NVivo. Retrieved from QSR International: http://www.qsrinternational.com/

Ratliff, R., & Weatherford, L. R. (2013). Codeshare and alliance revenue management best practices: AGIFORS roundtable review. *Journal of Revenue and Pricing Management, 12*(1), 26-35. doi:10.1057/rpm.2012.23

Raza, S. A. (2015). Optimal fare price differentiation with demand leakage in airline industry. *International Journal of Revenue Management, 8*(2), 99-129. doi:10.1504/IJRM.2015.069999

Reiman, A. D., Johnson, A. W., & Cunningham, W. A. (2011). Competitive advantage and fuel efficiency in aviation. *Journal of Transportation Management, 22*(2), 75-91. Retrieved from https://www.journals.elsevier.com/research-in-transportation-business-and-management/

Reiter, S., Stewart, G., & Bruce, C. (2011). A strategy for delayed research method selection: Deciding between grounded theory and phenomenology. *Electronic Journal of Business Research Methods, 9*(1), 35-46. Retrieved from http://www.academic-conferences.org/ejournals.htm

Rev. (2016). *Transcription*. Retrieved from https://www.rev.com/transcription

Ringle, C., Sarstedt, M., & Zimmermann, L. (2011). Customer satisfaction with commercial airlines: The role of perceived safety and purpose of travel. *Journal*

of Marketing Theory & Practice, 19(4), 459-472. doi:10.2753/mtp1069-6679190407

Robinson, J. (2012). The regulation of airport charges: An important input into the price of travel. *Travel Law Quarterly, 4*(2), 155-159. Retrieved from http://www.travellawquarterly.co.uk/

Rose, N. L. (2012). After airline deregulation and Alfred E. Kahn. *American Economic Review, 102*(3), 376-380. doi:10.1257/aer.102.3.376

Scully, J. (2013). Agile HR delivery. *Workforce Solutions Review, 4*(6), 8-12. Retrieved from http://www.ihrimpublications.com/

Simkowitz, M. (1972). Modern financial theory. Impact on analysis of strategy. *Business Horizons, 15*(1), 89-96. doi:10.1016/0007-6813(72)90026-2

Simmons, G. (2015). Does hedging reduce risk? Analysis of large domestic airlines. *Journal of Business Strategies, 32*(1), 1-20. Retrieved from http://www.emeraldinsight.com/journal/jbs

Southwest Airlines Co. (2016, February 2). *Form 10-K 2015*. Retrieved from https://www.sec.gov/Archives/edgar/data/92380/000009238016000175/luv-12312015x10k.htm

Tan, K. (2016). Incumbent response to entry by low-cost carriers in the U.S. airline industry. *Southern Economic Journal, 82*(3), 874-892. doi:10.1002/soej.12117

Tarry, C. (2011). High hedges ruin the view. *Airline Business, 27*(11). Retrieved from https://www.flightglobal.com/products/airline-business/

Tarry, C. (2015). Short-term gains, long-term impact. *Airline Business, 31*(1). Retrieved from https://www.flightglobal.com/products/airline-business/

The Econometric Society. (1971). Theory of finance. *Econometrica, 39*(4), 163-166. Retrieved from http://www.jstor.org/stable/1912418

Tokic, D. (2012). When hedging fails: What every CEO should know about speculation. *Journal of Management Development, 31*(8), 801-807. doi:10.1108/02621711211253259

Treanor, S. D., Simkins, B., & Rogers, D. (2014). Does operational and financial hedging reduce exposure? Evidence from the U.S. airline industry. *Financial Review*, 149-172. doi: 10.1111/fire.12029

Treanor, S., Carter, D., Rogers, D., & Simkins, B. (2013). Operational and financial hedging: friend or foe? Evidence from the U.S. airline industry. *Journal of Accounting and Finance, 13*(6), 64-91. Retrieved from http://www.na-businesspress.com/jafopen.html

Triana, P. (2011). Hedging is not riskless. *Corporate Finance Review, 15*(5), 42-45. Retrieved from http://hankboerner.com/library/cfr.stm

Troutt III, J. E., Bliss, T. J., & Depperschmidt, C. L. (2014). Management and employee perceptions of fuel conservation programs within a U.S. supplemental air carrier. *Collegiate Aviation Review, 32*(2), 79-95. Retrieved from https://www.researchgate.net/journal/1523-5955_Collegiate_Aviation_Review

Turner, P. (2014). *Determining the optimal commodity and hedge ratio for cross-hedging jet fuel.* North Dakota State University, Agribusiness and Applied Economics.

Ann Arbor: ProQuest, UMI Dissertations Publishing. Retrieved from http://search.proquest.com.ezp.waldenulibrary.org/docview/1566478705?accountid=14872

United Continental Holdings, Inc. (2016, February 18). *Form 10-K 2015*. Retrieved from https://www.sec.gov/Archives/edgar/data/100517/000119312516468479/d13806d10k.htm

U.S. Department of Health and Human Services. (2016). *Office of Research Integrity*. Retrieved from https://ori.hhs.gov/education/products/n_illinois_u/datamanagement/dhtopic.html

United States Department of Transportation. (2015). *Bureau of Transportation Statistics*. Retrieved from http://www.transtats.bts.gov/Tables.asp?DB_ID=135&DB_Name=Air%20Carrier%20Financial%20Reports%20%28Form%2041%20Financial%20Data%29&DB_Short_Name=Air%20Carrier%20Financial

United States Energy Information Administration. (2015). *US Energy Information Administration independent statistics and analysis*. Retrieved from http://www.eia.gov/petroleum/

Wang, L., & Wissel, J. (2013). Mean-variance hedging with oil futures. *Finance and Stochastics, 17*(4), 641-683. doi:10.1007/s00780-013-0203-x

Wang, N., & Teo, C. (2013). Integrated hedging and network planning for container shipping's bunker fuel management. *Maritime Economics & Logistics, 15*(2), 172-196. Retrieved from http://link.springer.com/journal/41278

WebFinance, Inc. (2015). *Cost per available seat mile*. Retrieved from http://www.businessdictionary.com/definition/cost-per-available-seat-mile-CASM.html

WebFinance, Inc. (2015). *Market price*. Retrieved from http://www.businessdictionary.com/definition/market-price.html

WebFinance, Inc. (2015). *Risk mitigation*. Retrieved from http://www.investorwords.com/19332/risk_mitigation.html

Wu, F., Guan, Z., & Myers, R. J. (2011). Volatility spillover effects and cross-hedging in corn and crude oil futures. *Journal of Futures Markets, 31*(11), 1052-1075. doi:10.1002/fut.20499

Yang, X. (2011). Competitive network and competitive behavior: A study of the U.S. airline industry. *Academy of Strategic Management Journal, 10*(1), 45-63. Retrieved from http://www.alliedacademies.org/academy-of-strategic-management-journal

Zarb, B. (2014). Valuation of airline companies: A function of earnings or cash? *International Journal of Business, Accounting, & Finance, 8*(2), 59-72. Retrieved from http://www.iabpad.com/journals/international-journal-of-business-accounting-finance

Appendix A: Interview Protocol

Name: _____ Day: _____
Company: _____ Time: _____
Position: _____

The focus of this evaluation will be to better understand the use of financial hedging as a financial tool for top managers within the U.S. airline industry as a viable option to reduce the risk of exposure from the volatility of jet fuel prices.

My purpose in talking with you today is to learn more about your thoughts, feelings, and experiences with the use of financial tools such as hedging.

Anything you tell me will not be personally attributed to you in any reports that result from this evaluation. All of the reports will be written in a manner that no individual comment can be attributed to a particular person.

Your participation in this interview is completely voluntary. Are you willing to be interviewed?

Do you have any questions before we begin?

1. How has your current/former position within the U.S. airline industry utilized financial tools such as hedging?

2. When, why, and how U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel at a time of lower jet fuel prices?

3. When would U.S. airline financial managers consider the use of hedging as a financial tool to mitigate the risk in the purchase of jet fuel?

4. What are your impressions of the use of hedging as a financial tool to mitigate risk in the purchase of jet fuel?

5. How has your organization been affected by the use of financial tools such as hedging?

6. How effective is the use of hedging or other financial tools at mitigating risk in the purchase of jet fuel?

7. Which program components are essential for successful implementation of financial tools to mitigate risk?

8. What barriers did you encounter while implementing financial tools?

9. Why would U.S. airline financial managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

10. How would U.S. airline managers use hedging as a financial tool to mitigate risk in the purchase of jet fuel?

11. From the oil companies' perspective, would they allow hedging at a time of lower jet fuel prices? Why or why not?

12. Do you have any additional comments about the use of hedging as a financial instrument in the procurement of jet fuel that we have not already discussed?

Thank you for your time!

Appendix B: NVivo Word Frequency

NVivo