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Master's Thesis

The Impact of Supply Chain Management on Competitive Advantage and Organizational Performance at Starwood Industries

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DECLARATION

I declare that the work in this thesis is completely my own work. No part of this thesis is taken from other peoples' work without giving them credit. All references have been clearly cited.

CHAPTER ONE

GENERAL FRAMEWORK OF STUDY

1.1 Introduction

The notion of supply chain management has recently received much attention as one of the key topics in the arena of operations management. The increasing interest in this topic by academics, researchers, and practitioners all over the world is due to several reasons including, but not limited to, highly competitive markets, more globalization, product diversity, outsourcing, short production cycles, technological development, and demanding customers (Lockamy & McCormack, 2004).

Thus, several empirical studies have examined the effect of supply chain management on many variables including, among other variables, competitive advantage and organizational performance (e.g. Lawson et al., 2009; Martin & Paterson, 2009). Several empirical studies indicate that effective supply chain management enhances competitive advantage and improve overall performance of companies. In addition, findings confirm that there is direct association between competitive advantage and organizational performance (Li et al., 2005; Spina et al., 2015).

Supply chain management refers to managing and negotiating of product and information processes among suppliers of material, manufacturers, and customers (Scannell et al., 2000). Competitive advantage, on the other hand, denotes the extent to which an organization can create a strong position relative to its competitors in a way that enables the organization to achieve more profits than its competitors do (McGinnis & Vallopra, 1999). Finally, organizational performance is the extent to which an organization attains its goals including market and financial ones. Based on this definition, the key performance indicators are market share, rate of growth, and return on assets (Vickery et al., 1991).

In 1997, the Starwood Industries was established in the United Arab Emirates. Since its establishment, Starwood Industries has become one of the most important companies in the design, manufacturing, and installation of wooden products including doors and kitchens. The company has a total labor force of more than 800 employees working in the United Arab Emirates and Egypt. Recently, the company has been facing severe competition locally and regionally.

Therefore, the primary aim of the current study is to examine the effect of supply chain management on the competitive advantage and organizational performance in Starwood Industries. Specifically, the supply chain management practices of Starwood Industries, its competitive advantage, and its organizational performance will be assessed, and the different associations between these variables will be examined. This in turn will help the company improve its supply chain management, enabling the company to strengthen its competitive advantage relative to its competitors and enhance its organizational performance.

1.2 Problem Statement

Since the business environment where Starwood Industries is operating is becoming more and more competitive, Starwood Industries is highly recognizing the need to focus on supply chain management to improve its competitive advantage and thus enhance its organizational performance.

Therefore, and in spite of the increasing interest in and importance of supply chain management, especially for manufacturing companies like Starwood Industries, studies regarding the effect of supply chain management on business variables such as competitive advantage and organizational performance are still rare. Accordingly, there is a significant need for more research on this topic.

In light of the above, this study is conducted to answer the following key question:

What is the effect of supply chain management on the competitive advantage and organizational performance of Starwood Industries?

The sub-questions are:

1. What is the level of supply chain management in Starwood Industries from employees' viewpoint?

2. What is the level of competitive advantage in Starwood Industries from employees' viewpoint?

3. What is the level of organizational performance in Starwood Industries from employees' viewpoint?

4. Does supply chain management affect competitive advantage in Starwood Industries?

5. Does supply chain management affect organizational performance in Starwood Industries?

6. Does competitive advantage affect organizational performance in Starwood Industries?

7. Does competitive advantage mediate the direct relationship between supply chain management and organizational performance at Starwood Industries?

1.3 Significance of Study

This study derives its significance from the following main points:

1. Supply chain management is a powerful tool that is used in order to achieve competitive advantage and thus enhance organizational performance (Lockamy & McCormack, 2004), particularly in manufacturing companies.

2. The dramatic changes in business environments globally due to many factors (Lockamy & McCormack, 2004) put companies in general, and manufacturing ones in particular, under increasing pressure to focus more on managing their supply chains to be in strong competitive positions. This in turn will enable these companies to enhance their organizational performance.

3. There is an increasing need for companies to realize the importance of supply chain management and utilize this management tool to enhance their competitive advantage relative to their competitors and ultimately improve their organizational performance.

4. Due to the importance and role of supply chain management, more empirical studies on the different relationships between supply chain management, competitive advantage, and organizational performance need to be carried out.

1.4 Objectives of Study

The primary objective of the current study is to examine the effect of supply chain management on competitive advantage and organizational performance in Starwood Industries.

However, the specific objectives are:

1. To assess the level of supply chain management in Starwood Industries from employees' viewpoint.
2. To assess the level of competitive advantage in Starwood Industries from employees' viewpoint.
3. To assess the level of organizational performance in Starwood Industries from employees' viewpoint.
4. To examine the effect of supply chain management on competitive advantage of Starwood Industries.
5. To examine the effect of supply chain management on organizational performance of Starwood Industries.
6. To examine the effect of competitive advantage on organizational performance of Starwood Industries.
7. To examine the role that competitive advantage may play in mediating the relationship between supply chain management and organizational performance at Starwood Industries.

1.5 Hypotheses of Study

In order to examine the relationships between supply chain management, competitive advantage, and organizational performance at Starwood Industries, the following hypotheses are tested:

H_1: Supply chain management has a direct positive effect on the competitive advantage of Starwood Industries.

H_2: Supply chain management has a direct positive effect on the organizational performance of Starwood Industries.

H_3: Competitive advantage has a direct positive effect on the organizational performance of Starwood Industries.

H_4: Competitive advantage mediates the relationship between supply chain management and organizational performance at Starwood Industries.

The structural equation model of the study is depicted in Figure 1.1 where the first three hypotheses are shown.

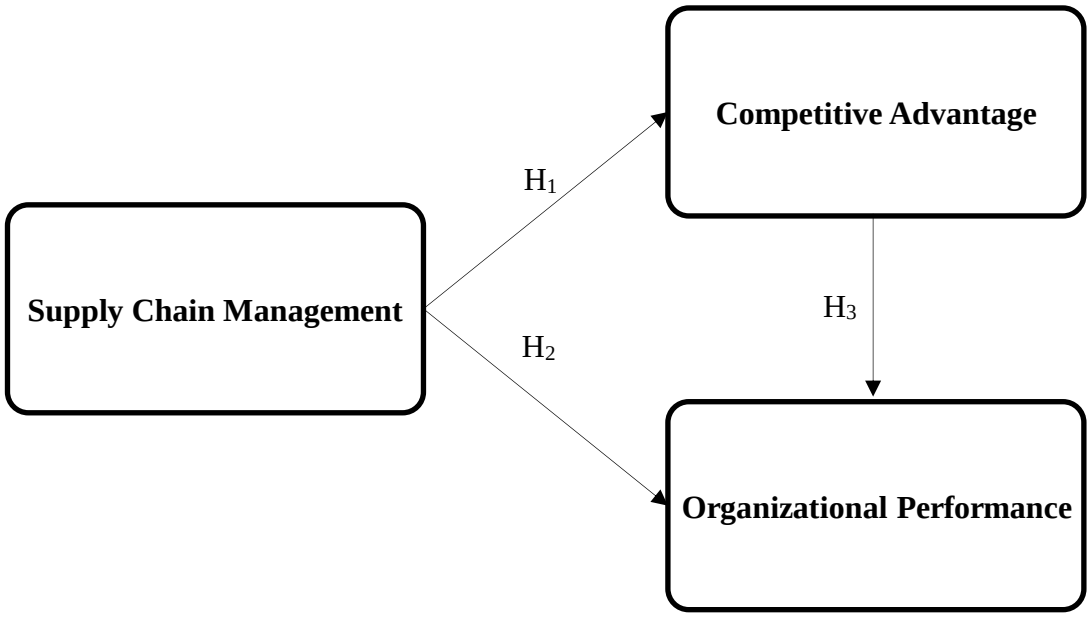

Figure 1.1: Structural Equation Model of Study

1.6 Definitions

The most important terms in this study are defined below:

1. Supply Chain Management: Managing and negotiating of product processes and information processes among suppliers of material, manufacturing, and customers (Scannell et al., 2000).

2. Competitive Advantage: The degree to which an organization can build a strong position over its rivals. This strong position enables the organization to achieve more profits than its rivals do (McGinnis & Vallopra, 1999).

3. Organizational Performance: The extent to which an organization attains its market-related goals and financial-related goals. Therefore, the key performance indicators are market share, rate of growth, and return on assets (Vickery et al., 1991).

1.7 Structure of Study

The structure of the study is as follows:

Chapter One: General Framework of Study.

Chapter Two: Literature Review.

Chapter Three: Theoretical Framework of Study.

Chapter Four: Research Methodology.

Chapter Five: Data Analysis and Discussion.

Chapter Six: Conclusions and Recommendations.

CHAPTER TWO

LITERATURE RIVIEW

There is a huge body of knowledge concerning the impact of supply chain management on both competitive advantage and organizational performance. Below is a review of the most important literature on the different relations between these three variables, chronologically arranged from the most to the least recent.

Starting from China, **Baah and Jin (2019)** carried out an empirical study to examine the effect of supply chain management on organizational performance of companies in the logistics industry, taking into consideration competitive advantage as a moderating variable. The quantitative research method is adopted in the study, using a questionnaire to collect the primary data from 190 managers. Inferential statistics, including structural equation modelling, are used in data analysis.

The findings of the study indicate that supply chain management has a significant positive effect on organizational performance. Moreover, the findings confirm that competitive advantage has a significant positive effect on organizational performance. Finally, competitive advantage mediates the relationship between supply chain management and organizational performance.

In Vietnam, **Quynh and Huy (2018)** carried out an empirical study to investigate the effect of supply chain management on the organizational performance of SMEs, with competitive advantage as a moderating variable. The primary data are gathered, using a questionnaire, from a purposive sample of 183 SMEs in the City of Ho Chi Minh. Statistical analysis techniques such as descriptive statistics, correlation, factor analysis, and regression analysis are utilized for the purpose of data analysis.

The findings of the study indicate that three dimensions of supply chain management (i.e. customer relationship, level of information sharing, and quality of information sharing) have a significant effect on organizational performance. On the other hand, strategic supplier partnership has no significant effect on organizational performance. Additionally, the findings indicate that the four dimensions of supply chain management significantly affect competitive advantage. Finally, competitive advantage has a significant positive effect on organizational performance.

In Nigeria, **Benedict (2017)** analyzed the influence of supply chain management on the financial performance of listed soft drink companies in Enugu. The researcher study adopted the analytical descriptive research design. The comprehensive sampling technique is used to collect the primary data from 40 managers working in departments linked to supply chain management. Inferential statistics, including the linear regression technique, are utilized to analyze data.

The findings of the study indicate that supply chain management has a significant impact on the financial performance of listed soft drink companies in Enugu, South East Nigeria. Specifically, practices of supply chain management including strategic supplier relationship, electronic data interchange, and inventory management has a significant positive effect on return on investment.

In Sri Lanka, **Wijetunge (2017)** carried out an empirical study that aims to investigate the impact of supply chain management on organizational performance with a mediation role of competitive advantage. The researcher used the analytical descriptive research design. The study population comprises all managers and/or owners of 548 manufacturing SMEs in Colombo region, whereas the study sample consists of 155 of those managers and/or owners who are randomly selected to provide the primary data using the questionnaire instrument as a data collection method. Different statistical techniques such as descriptive statistics, correlation, and regression analysis are used to analyze the primary data.

The findings of the study confirm that supply chain management has a significant positive impact on organizational performance with competitive advantage partially mediates this relationship.

Singh et al. (2017) investigated the different associations between supply chain management, competitive advantage, and organizational performance of non-livestock retailers in five different Indian territories. The researchers used the quantitative research design where the structural equation modelling technique is utilized.

Supply chain management is measured using five components: (1) using technology, (2) speed of supply chain, (3) customer satisfaction, (4) integration of supply chain, and (5) inventory management. Competitive advantage is measured using four dimensions: (1) inventory management, (2) customer satisfaction, (3) profitability, and (4) customer base identification. Finally, organizational performance is measured using the six

constituents of financial performance, market performance, supply chain capabilities, customer satisfaction, stakeholder satisfaction, and learning and innovation.

The key finding of the study shows that supply chain management significantly affects competitive advantage but there is no significant effect of supply chain management and competitive advantage on organizational performance.

Spina et al. (2015) carried out an empirical study to analyze the impact of supply chain management on organizational performance. The researchers used the analytical descriptive research design. Data are collected, using a questionnaire, from a sample of 875 international companies in North America, Europe, the Middle East, Africa, Asia Pacific, and Latin America. Statistical tools such as descriptive statistics and linear regression are used in data analysis.

The findings of the study indicate that some dimensions of supply chain management have a significant positive impact on organizational performance. Specifically, the findings indicate that collaboration and distribution have a significant positive impact on organizational performance while production management, planning, transportation, and inventory have no significant impact on organizational performance.

Karimi and Rafiee (2015) investigated the effect of supply chain management on the organizational performance of Iran Pumps Company with competitive advantage as a moderating variable. The population of the study consists of all employees of the company while 483 employees are randomly chosen to collect the primary data. The analytical descriptive research design is adopted using descriptive statistics (i.e. means, standard deviations, and correlations) and inferential statistics (i.e. factor analysis and structural equation modelling) in data analysis. The primary data are collected using a questionnaire.

The findings of the study confirm that supply chain management, through the mediating role of competitive advantage, has a significant positive effect on the organizational performance of Iran Pumps Company.

In Pakistan, **Hussain et al. (2014)** examined the influence of supply chain management on the organizational performance of consumer goods manufacturing companies. The analytical descriptive approach is adopted. Using a questionnaire, primary data are gathered from 331 employees and managers in 83 consumer goods manufacturing

companies in 11 cities in the country based on quota sampling method. Collected data are analyzed using both descriptive statistics and inferential statistics.

The findings of the study indicate that practices of supply chain management are at an early stage in Pakistan. In addition, the findings of the study confirm that strategic supplier partnership is directly related to organizational performance, whereas both information sharing and postponement are inversely related to organizational performance.

In Ghana, **Mensah et al. (2014)** investigated the impact of supply chain management on the organizational performance of Kasapreko Company. The primary data are collected, using the questionnaire instrument, from a random sample of 200 customers of the company. In addition, interviews are conducted with main employees. The researchers used descriptive statistics, utilizing the SPSS in data analysis.

The findings of the study reveal that the company adopt supply chain management. The finding of the study also indicate that supply chain management has a significant positive impact on the organizational performance of the company.

In India, **Kumar and Nambirajan (2013)** examined the effect of supply chain management constituents and performance on the performance of manufacturing companies in the Union Territory of Puducherry. The researchers applied the analytical descriptive research design. The sample of the study consists of 255 managers of manufacturing companies in the study area who are randomly selected to provide the primary data using a questionnaire. Statistical analysis techniques such as ANOVA, factor analysis, and structural equation modelling are employed in data analysis.

The main finding of the study confirm that supply chain management constituents and performance interact with each other and affect organizational performance.

In Kenya, **Nyangweso (2013)** carried out a study to investigate the impact of supply chain management on organizational performance of sugar manufacturing companies. The analytical descriptive research is adopted utilizing a questionnaire as a data collection method. The population of the study comprises the ten sugar manufacturing companies in the country. A comprehensive survey of these companies is used. Descriptive statistics and inferential statistics are used in data analysis.

The results of the study confirm that supply chain management positively affect the dimensions of organizational performance. Specifically, good application of supply chain management leads to: (1) less operational costs, (2) less time of product design, (3) more accuracy in processing customer orders, (4) enhanced market share, and (5) more customer satisfaction.

In Malaysia, **Khang et al. (2010)** explored the effect of supply chain management on the organizational performance in the service sector. The researchers adopted the analytical descriptive research design whereby primary data are collected using a questionnaire from a sample of service companies. Six practices of supply chain management are considered: (1) customer orientation, (2) knowledge sharing, (3) IT adoption, (4) partnership, (5) leadership, and (6) training. The regression analysis technique is used in analyzing data.

The key finding of the study indicates that four dimensions of supply chain management practices (i.e. customer orientation, IT adoption, leadership, and training) significantly affect the organizational performance of service companies.

Soderberg and Bengtsson (2010) investigated the impact of supply chain management on the performance of 15 SMEs operating in the engineering industry in Sweden. The researchers used the analytical descriptive research design. Primary data are collected using a questionnaire. Descriptive statistics and correlation analysis are used to analyze the primary data.

The main finding of the study reveals that supply chain management has a significant positive impact on the financial performance of SMEs.

In Taiwan, **Chen et al. (2006)** examined the different relations between e-supply chain capability, competitive advantage, and organizational performance in manufacturing companies. The researchers used the analytical descriptive research design. The primary data are gathered from 130 companies using a questionnaire. The statistical tools that are utilized in data analysis include, among other tools, descriptive statistics and structural equation modeling.

The findings of the study reveal that higher levels of e-supply chain capability and competitive advantage are associated with better organizational performance. In

addition, competitive advantage has a significant positive effect on organizational performance.

Finally, **Li et al. (2006)** investigated the different relations between supply chain management, competitive advantage, and organizational performance. The researchers adopted the analytical descriptive method. Data are gathered from 196 companies. The structural equation modeling technique is used to test the different relations between the variables.

The findings of the study emphasize that good supply chain management practices positively affect competitive advantage and organizational performance. In addition, the findings confirm that competitive advantage has a significant positive influence on organizational performance.

CHAPTER THREE

THEORETICAL FRAMEWORK OF STUDY

3.1 Supply Chain Management

In this section, the concept of supply chain management will be defined, its main benefits will be highlighted, and finally its dimensions will be discussed.

3.1.1 Concept of Supply Chain Management

The concept of "supply chain management" did not appear until the 1980s. However, this term was not popular until the late 1990s, with the majority of empirical studies in this field beginning in 1997 (Lambert et al., 1998).

Recently, supply chain management has gained increasing attention mainly due to the fact that companies have to depend on efficient supply chains to compete domestically and globally. Therefore, these companies must manage not only their own business functions but also their relations with other suppliers (Stock et al., 2010).

Although there is no consensus among academics and researchers on the definition of supply chain management, below is a review of the most important definitions of this concept.

Before defining the concept of supply chain management, it is worth saying that supply chain is an integrated process consisting of businesses that convert raw materials into intermediate or finished products and distribute them to end customers (Pienaar, 2009). Similarly, Beamon (1998) defined it as an organized process in which raw materials are transformed into goods, and then transported to final users.

Regarding supply chain management, Boonitt and Pongpanarat (2011) defined it as the process of predicting, planning, executing, and controlling the supply chain to meet customer needs efficiently. This process includes directing and monitoring the flow of goods and services, information, and money within the same company and among suppliers.

According to Li et al. (2006), supply chain management is a range of activities that are carried out by an organization to enhance managing its supply chain in an effective manner.

Grant et al. (2006) view supply chain management as a comprehensive process that controls the flow of products and services, money, and information among suppliers, manufacturers, and end customers in a value-added manner. Otto and Kotzab (2003) described supply chain management as a unique type of strategic cooperation among businesses, suppliers, and customers.

As stated by Simchi-Levi et al. (2003), supply chain management is a system that is used to manage suppliers, producers, and stores in an effective way to produce and distribute the right quantities, to the right places, and at the right time to save costs but at the same time meet desired requirements.

Moreover, Mentzer et al. (2001) defined supply chain management as the process that coordinates the business functions and the procedures across these functions within a given company and across companies within the supply chain in order to enhance the performance of these companies individually and the supply chain as a whole. This definition focuses on the existence of a number of companies that are directly engaged in the flows of goods and services, funds, and information from these companies to end customers.

Cooper and Ellram (1993) defined supply chain management as an integrated approach for managing the flow of a supply network from the supplier to the end user. Finally, supply chain management can be defined as the combination of the procedures, structures, and businesses that direct the flow of goods from suppliers to end customers in an efficient way (Ellaram, 1991).

For the purpose of this research, supply chain management is defined as an integral approach for the management of the movement of goods and services, funds, and information from suppliers to end customers.

3.1.2 Benefits of Supply Chain Management

The topic of supply chain management has recently been the focus of many organizations around the world due to the many benefits that are generated from its effective application (Ballou et al., 2000). The most important of these benefits, as mentioned in the literature, are briefly highlighted below.

AbTalib and Abdul Hamid (2014) conclude that managing supply chain effectively has several benefits including: (1) less operating cost, (2) improved service dependability,

(3) less inventory level, (4) shorter cycle time, (5) less late orders, (6) more efficiency, (7) less waste, (8) enhanced customer satisfaction, and (9) improved competitive position.

Benefits of supply chain management also include: (1) timely delivery, (2) more inventory turnover, (3) shorter cycles, (4) risk minimization, (5) product availability, (6) reduction of organizational processes, (7) more responsiveness, (8) capital utilization, (9) less product time to market, (10) cost reduction, (11), better quality, and (15) product development (Valmohammadi, 2013).

Qayyum al. (2013) confirmed that businesses need to know the notions of supply chain management in order to gain competitive edge over their competitors and thus increase profits. Tan et al. (2002) had reached the same conclusion when they said that understanding and applying the concept of supply chain management has become a necessity to remain competitive in the marketplace and to increase profitability as well.

Many empirical studies also confirm that effective supply chain management has a positive effect on the financial and marketing performance of companies including sales, returns on assets and investments, profits, and ultimately market shares (e.g. Li et al., 2006).

According to Lee (2004), five main benefits emerge from effective management of supply chains: (1) more customer orders in high seasons, (2) response to market, (3) more value added, (3) capital exploitation, (4) less product time to market, and (5) reduced logistic costs. Together, these benefits lead to an increase in revenues.

As confirmed by several researchers, good supply chain management strengthens the total competitive edge of companies (Li et al., 2006). According to Lockamy and McCormack (2004), supply chain management is a vital contributor to competitive advantage. This idea was previously confirmed by Jones (1998) who concluded that several businesses understand that supply chain management is critically important to create competitive advantage in increasingly competitive markets.

Supply chain management also lead to: (1) strong customer relationships, (2) more sales, and (3) larger market share (Ferguson, 2000).

As explained by Christopher (1998), effective supply chain management has increasingly been regarded as a main factor in distinguishing products and services and thus gaining competitive edge for corporations.

Finally, Lee and Billington (1992) argue that supply chain management could be used as a significant tool to create a strong competitive position over competitors by decreasing the level of investment while maintaining the same level of customer satisfaction.

3.1.3 Dimensions of Supply Chain Management

Supply chain management has several dimensions that have been mentioned in previous literature. The most important of these dimensions are briefly highlighted below.

According to Zhao and Lee (2009), the main dimensions of supply chain management are: (1) supplier partnership, (2) outsourcing, (3) continuous process flow, and (4) information technology sharing.

Krause et al. (2007) identified eight dimensions of supply chain management: (1) buyer commitment, (2) joint values, (3) information sharing, (4) supplier assessment, (5) supplier development, (6) duration of relationship, (7) buyer dependency, and (8) supplier dependency.

Carr and Kaynak (2007) say that supply chain management has five major components: (1) traditional communications, (2) modern communications, (3) internal information sharing, (4) external information sharing, and (5) supplier development support.

Li et al. (2006) categorized the dimensions of supply chain management into four different groups: (1) strategic supplier partnership, (2) customer relationship, (3) level of information sharing, and (4) quality of information sharing.

Sengupta et al. (2006) listed seven areas of supply chain management: (1) information sharing, (2) customization, (3) relationships, (4) hedging strategy, (5) planning systems, (6) Internet leveraging, (7) supply system, and (8) distribution system.

The main dimensions of supply chain management includes supply management issues, material management issues, operations, IT and information sharing, and customer service (Tan et al., 2002). Earlier, Tan (2001) proposed five dimensions of supply chain management: (1) supply chain integration, (2) information sharing, (3) supply chain

features, (4) customer service management, and (5) geographical closeness and JIT competency.

Finally, McMullen (1996) pointed out that technology, cost, inventory, effectiveness, and regulations are the main dimensions that need to be managed within the supply chain. According to Donlon (1996), supply chain management involves five main constituents: (1) supplier partnership, (2) outsourcing, (3) cycle time, (4) process flow, and (5) IT sharing.

In this research, the four dimensions of Li et al. (2006) are used to measure the level of supply chain management at Starwood Industries. These dimensions are: (1) strategic supplier partnership, (2) customer relationship, (3) level of information sharing, and (4) quality of information sharing.

3.2 Competitive Advantage

In this section, the concept of competitive advantage is defined, its importance is discussed, and finally its main dimensions are highlighted.

3.2.1 Concept of Competitive Advantage

According to Kroes and Ghosh (2010), competitive advantage refers to the degree to which an organization is capable of defending its position over its rivals. Consistent with this view, King (2007) concluded that competitive advantage includes resources or capabilities that are difficult to duplicate and are critical in assisting an organization outperform its competitors in the market.

The competitive advantage of an organization is measured by the gap between the value added and the costs incurred to produce the product or service in comparison with its key rivals. Specifically, if the value added is more than that of its rivals, an organization has a competitive advantage. If it is the same as that of rivals, an organization has competitive parity. Finally, if it is less than that of rivals, an organization is described to have a competitive disadvantage (Rothaermel, 2008).

Li et al. (2006) defined competitive advantage as the set of factors that would enable an organization to differentiate itself from its rivals and thus build a state of defense against them. An organization is said to have a competitive advantage if it has a good or service that is viewed by customers as better than that of its rivals (Dess et al., 2005).

Competitive advantage can also be defined as the competences and variables that could enable an organization to perform better than main rivals do in the market (Sadri & Lees, 2001).

Moreover, competitive advantage refers to the degree to which an organization can build a strong position over its rivals. This strong position would enable the organization to achieve more profits than its rivals do (McGinnis & Vallopra, 1999).

Earlier in 1985, Porter proposed that an organization has a competitive advantage when it is able to create a defensible position over its competitors. This comprises capabilities that allow organizations to differentiate themselves from their competitors through strategic decisions.

3.2.2 Benefits of Competitive Advantage

Liere et al. (2010) argued that competitive advantage results in high level of performance, more satisfied consumers, highly loyal customers, effective relationships, enhanced brands, less product switching, and eventually more sales and profits for organizations.

According to Sadri and Lees (2001), competitive advantage enables organizations to financially outperform their competitors. The same idea is articulated later by Raduan et al. (2009) who concluded that competitive advantage and organizational performance are positively related.

Earlier in 1999, Chaharbaghi and Lynch concluded that competitive advantage helps an organization to create additional value for its customers and achieve greater profitability for the organization itself.

Finally, Moran (1981) confirmed that competitive advantage results in enhanced performance, satisfied and loyal customers, effective relations, and increased sales and profits.

3.2.3 Dimensions of Competitive Advantage

In general, competitive advantage consists of all capabilities that enable an organization to distinguish itself from its rivals. These capabilities are typically the result of strategic managerial decisions (Peng et al., 2011).

Some of the elements that could strengthen the competitive position of organizations include: (1) product differentiation (Wittstruck & Teuteberg, 2012), (2) loyal customers (Wittstruck & Teuteberg, 2012), new market opportunities (Rao & Holt, 2005), and (3) enhanced corporate image (Wittstruck & Teuteberg, 2012).

Other dimensions of competitiveness mentioned in the literature are: (1) price/cost (Yang et al., 2010), (2) quality (Mitra & Datta, 2014), (3) delivery reliability (Yang et al., 2010), and (4) capacity exploitation (Mitra & Datta, 2014).

Competitive advantage consists of five main dimensions: (1) competitive pricing, (2) premium pricing, (3) quality, (4) reliable delivery, and (5) production innovation (Jie et al., 2013).

According to Robb et al. (2008), the most important competitive advantage dimensions are: (1) price/cost, (2) quality, (3) delivery, and (4) flexibility.

Li et al (2006) confirmed that competitive edge depends on five main factors: (1) price/cost, (2) quality, (3) reliable delivery, (4) innovative production, and (5) time to market. In this context, the first dimension refers to the degree to which an organization is able to compete based on low prices. The second dimension refers to the degree to which an organization is able to deliver quality products that create value for customers. The third dimension refers to the degree to which an organization is able to deliver the right quantities of the product, to the right places, and at the right time. The fourth dimension refers to the degree to which an organization is able to introduce new products. Finally, time to market refers to the degree to which an organization is able to introduce new products more rapidly than key rivals.

The competitive stance of an organization depends on what the organization provides in terms of value generation in comparison to that of its main rivals. This competitive stance is mostly determined by three factors: (1) product quality, (2) customer loyalty, and (3) company reputation (Gorynia, 2004).

The capabilities that are necessary to gain competitive advantage over competitors are: (1) competitive prices, superior quality, more dependability, and less delivery time (Mentzer et al., 2001).

In addition, the most important constituents of competitive advantage are: (1) price, (2) quality, (3) distribution, and (4) flexibility (Tracey et al., 1999). Many academics and

researchers identified time as a major source of competitive edge for organizations (e.g. Handfield & Pannesi, 1995; Kessler & Chakrabarti, 1996).

In 1985, Porter proposed two strategies that can lead to competitive advantage: (1) cost advantage, and (2) differentiation advantage. The first occurs when an organization provides the same value to its consumers as rivals at lower cost while the second happens when an organization delivers more benefits than those of competitors.

In this research, the five dimensions of Li et al. (2006) will be used to measure the level of competitive advantage at Starwood Industries. These dimensions are: (1) price/cost, (2) quality, (3) delivery dependability, (4) product innovation, and (5) time to market.

3.3 Organizational Performance

In this section, the concept of organizational performance is defined and the different measures of organizational performance are discussed.

3.3.1 Concept of Organizational Performance

There are many definitions of organizational performance, depending on researchers' different views. In this section, the most important of these definitions are outlined.

Neely (2004) defined organizational performance as the total of all procedures that will lead management to take suitable actions today that will yield an effective and efficient organization tomorrow. In other words, organizational performance is doing in the present what will lead to value outcome in the future.

Organizational performance can be defined as the level to which an organization is able to meet the expectation of its key stakeholders including the owners, employees, and consumers (Aluko, 2003). He also defines organizational performance as the attainment or achievement of organizational objectives to a desired level of satisfaction.

Didier (2002) says that organizational performance refers to attaining the objectives that were specified in line with organizational orientations. In this view, performance is not only an outcome, but also requires comparing the outcome with the predetermined goal.

Vickery et al. (1991) said that organizational performance denotes the degree to which an organization attains its market-related and financial-related goals. From this

perspective, performance measurement indicators are market share, growth rate, and return on assets (ROA).

For the purpose of this research, organizational performance is defined as the extent to which an organization attains its market-related goals and financial-related goals.

3.3.2 Measurement of Organizational Performance

Unless organizational performance is measured, it can not be improved. Therefore, all organizations –small or large, private or public, NGOs or for profit companies– need to measure their performance.

In order to do so, organizations use financial measures only, non-financial measures only, or a combination of both. Below is a brief discussion of the most important approaches to organizational performance measurement.

According to Abdalkrim (2013), organizational performance is measured by comparing actual and expected output of an organization. To do this, there are three organizational performance measures: (1) financial performance, (2) market performance, and (3) shareholder return.

As Wagnera et al. (2012) say, organizational performance is measured using financial as well as market dimensions such as return on investment, profit margin on sales, market share, and competitive situation.

Financial performance measures include, among other measures, accounting measures such as gross and net income, value added income, operating and net profit, return on asset and return on investment, cash flow, and retained earnings (Horngren et al., 2006).

Slack et al. (2004) talked about operations performance. According to them, there are five dimensions to measure this type of performance: (1) cost, (2) quality, (3) speed, (4) dependability, and (5) flexibility.

According to Neely (2002), several approaches can be used to measure organizational performance. The most important of these include, among other things, the accounting approach (i.e. financial performance measures), the marketing approach (i.e. marketing measures), and the operations approach (i.e. effectiveness and efficiency measures).

Neely et al. (2002) proposed the performance prism model to measure organizational performance. The model involves five aspects to be dealt with by an organization: (1) stakeholders' satisfaction, (2) strategies, (3) processes, (4) resources, and (5) stakeholder's feedback.

In 2002, Kanji proposed four main dimensions to measure organizational performance: (1) stakeholder value, (2) process excellence, (3) organizational learning, and finally (4) customers' satisfaction. These four main dimensions are nearly the same as the four perspectives of the balanced scorecard that was suggested by Kaplan and Norton (2001).

The first two persons who developed a multi performance measurement system, called the balanced scorecard, are Kaplan and Norton in 1992. This performance measurement system involves four perspectives: (1) the financial perspective, (2) the customer or client perspective, (3) the internal processes perspective, and finally (4) the learning and growth perspective. They emphasize that non-financial measures assist managers in three main areas: (1) evaluating changes in the external environment, (2) assessing movement towards an organization's goals, and (3) confirming realization of organizational performance (Kaplan & Norton, 2001)

Both Ittner and Larcker (1998) said that organizations have to emphasize on financial as well as non-financial measures in their measurement of organizational performance. They recommend achieving a balance between financial measures including net income and revenue growth and non-financial ones. They believe that non-financial measures are expected to smooth decisions and actions.

A number of researchers (e.g. Stock et al., 2000; Vickery et al., 1999) measured organizational performance using financial-related and market-related indicators such as return on asset and investment, market share, profit margin, growth in sales, growth in market share, and competitive position.

According to Kohli and Jaworski (1996), organizational performance involves two performance measures. The first is cost-related performance measures and the second is revenue-related performance measures. The first one measures organizational performance after taking into account the cost of strategy implementation, whereas the second measures organizational performance without taking into consideration the cost of strategy implementation.

In this research, both financial and market criteria are used to measure organizational performance of Starwood Industries from the viewpoints of its employees.

3.4 Overview of Starwood Industries

Since its establishment in 1997, Starwood Industries has positioned itself as one of the most prominent joinery corporations in the GCC countries on the back of two up-to-date factories in the United Arab Emirates and Egypt.

These two factories extend over an area of approximately 300,000 square foot. Starwood Industries have major clients of top-class companies such as EMAAR, NAKHEEL, DAMAC, WASL, and MEYDAN GROUP.

Belonging to the manufacturing sector, Starwood Industries specializes in designing, manufacturing, and installing wooden products including, among other products, doors, kitchens, wardrobes, as well as solid surfaces.

Starwood Industries has a total labor force of 860 and 150 workers in Dubai and Egypt, respectively. Among the 860 workers in Dubai, 80 are office employees and the remaining 780 are production workers. There are 30 office employees and 50 production workers among the 80 personnel working in Egypt. The organizational chart of Starwood Industries is depicted in Figure 3.1.

The company implements total quality management practices in line with the ISO 9001 requirement. Starwood Industries is also certified by BM TRADA since it adheres to the standards of BS 476 for fire doors.

Finally, it is worth saying that Starwood Industries enjoy many competitive advantages over its main competitors. First, Starwood Industries is located in a strategic area, enabling the company to have short lead times. Moreover, the company has blue-chip clients who usually have large orders. In addition, Starwood Industries has modern facilities that enable the company to produce products that are characterized by their quality and diversity. Last, but not the least, Starwood Industries has good reputation in the market.

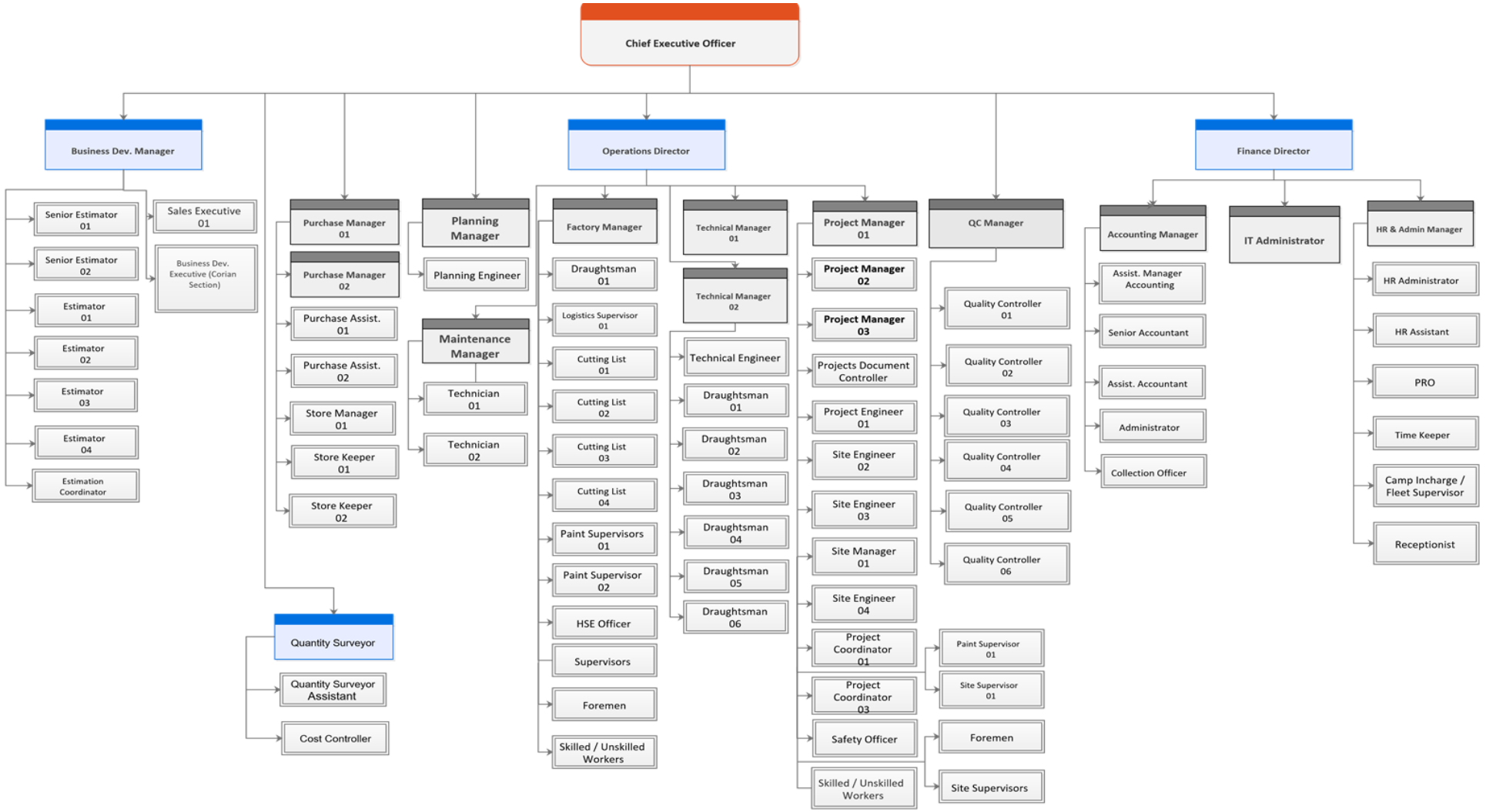

Figure 3.1: Organizational Chart of Starwood Industries

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Research Design

As mentioned previously, this study aims to examine the different relationships between supply chain management, competitive advantage, and organizational performance in Starwood Industries.

Research studies are qualitative or quantitative. Qualitative studies are carried out when data collected are exploratory in nature. These studies collect primary data from responses to interviews, or from answers to open-ended questionnaires, or through observations, or from secondary sources (Sekaran & Bougie, 2016).

Alternatively, quantitative studies are undertaken when theories are available and hypotheses are developed concerning the phenomena of interest. These studies generally gather data through structured questionnaires (Sekaran & Bougie, 2016).

The current study uses the quantitative hypothesis-testing empirical research design. The data on the three study variables (i.e. supply chain management, competitive advantage, and organizational performance) are collected from office employees of Starwood Industries in Dubai, UAE through a structured questionnaire that is electronically distributed.

4.2 Population and Sample

The population of study is the total number of people, events, or things of interest to the researcher. On the other hand, the sample of study is a subset of the whole population (Sekaran & Bougie, 2016).

Given that the purpose of this study is to investigate the different relationships between supply chain management, competitive advantage, and organizational performance in Starwood Industries, the population of the study consists of all office employees of this company who are currently working in the headquarters in Dubai, UAE. The total number of those employees is 80.

On the other hand, the sample of the study comprises 51 office employees, representing approximately 64% of the total population, who are randomly chosen to provide the primary data through electronic questionnaires.

In this context, it is important to say that the sample size (51 cases) is enough to apply the partial least squares structural equation modelling (PLS-SEM) according to the 10 times rule of thumb (Barclay et al., 1995), which requires the minimum sample size to be 10 times the maximum number of arrowheads pointing at a variable anywhere in the partial least squares (PLS) path model.

4.3 Data Collection Method

Having developed the study hypotheses, data on each variable have to be gathered. Generally, data can be gathered through observations, interviews, or questionnaires. The three main types of questionnaires are: (1) personally administered questionnaires, (2) mail questionnaires, and (3) electronic questionnaires (Sekaran & Bougie, 2016).

This study uses the questionnaire as a data collection method since it is more efficient, in terms of time and cost, than any other method. In detail, structured questionnaires are electronically distributed, using Google Forms, to a total of 80 office employees of Starwood Industries who are currently working in the company's headquarters in Dubai, UAE. A total of 51 completed and valid questionnaires are received within a period of approximately eight weeks.

There are five main reasons why questionnaires are decided to be electronically distributed: (1) they are easy to manage, (2) they can reach anyplace, (3) they are inexpensive, (4) their distribution is fast, and finally (5) respondents can answer at their convenience.

4.4 Research Instrument

As stated earlier, primary data are collected through a structured questionnaire. The developed questionnaire starts with an introduction in which the purpose of the study is stated and the confidentiality of data is assured. The questionnaire consists of four parts.

The first part aims to collect information on respondents' characteristics including gender, age, marital status, level of education, years of experience at Starwood Industries, job title, and job responsibilities.

The second part aims to collect data on the perceptions of employees of Starwood Industries regarding the level of supply chain management. This part includes 22 items that belong to four dimensions: (1) strategic supplier partnership, (2) customer relationship, (3) level of information sharing, and (4) quality of information sharing. These dimensions are used by Li et al. (2006).

The third part aims to collect data on the perceptions of employees of Starwood Industries regarding the level of competitive advantage. This part includes 16 items belonging to five dimensions: (1) price/cost, (2) quality, (3) delivery dependability, (4) product innovation, and (5) time to market. These dimensions are used by Li et al. (2006).

Finally, the fourth part aims to collect data on the perceptions of employees of Starwood Industries regarding the level of organizational performance. This part includes 7 items that belong to market performance and financial performance. These items are used by Li et al. (2006).

A 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), is used in the second, third, and fourth parts of the questionnaire. All items are positively worded. Thus, no items need to be reversed. Higher scores (i.e. moving from 1 to 5) indicate higher levels of supply chain management, competitive advantage, and organizational performance.

The levels of supply chain management, competitive advantage, and organizational performance in Starwood Industries are evaluated as shown in Table 4.1.

Table 4.1: Evaluation of Research Variables

Good	Very Good	Excellent
1 – 2.33	2.34 – 3.66	3.67 – 5

The questionnaire used in this study is included in Appendix A.

4.5 Unit of Analysis

The level at which data are gathered and analyzed is referred to as the unit of analysis. In this regard, the unit of analysis may be individuals, dyads, groups, organizations, nations, and the like (Sekaran & Bougie, 2016).

In this study, primary data are collected and subsequently analyzed at the individual level (i.e. at the level of each individual office employee in Starwood Industries). Specifically, the researcher is interested in looking at the data collected from each individual and dealing each employee's response as an individual data source. Accordingly, individuals are the unit of analysis.

4.6 Data Analysis Techniques

In this study, both descriptive statistics and inferential statistics are used. Specifically, descriptive statistics, including frequencies and percentages, are used to describe respondents' characteristics.

Descriptive statistics, including minimums, maximums, means, and standard deviations, are also used to assess the levels of supply chain management, competitive advantage, and organizational performance of Starwood Industries from the viewpoints of office employees who are currently working in the company's headquarters in Dubai, UAE.

Furthermore, the structural equation modelling (SEM) technique is used to test the different relationships between the variables of the study (i.e. supply chain management, competitive advantage, and organizational performance). In this context, it is worth noting that structural equation modelling (SEM) is one of the multivariate techniques that combines features of factor analysis and regression, enabling to instantaneously examine relationships among different variables.

There are two approaches to conducting structural equation modelling (SEM). The first is covariance-based structural equation modelling (CB-SEM) whereas the second is partial least squares structural equation modelling (PLS-SEM).

In this study, the PLS-SEM technique, rather than the CB-SEM technique, is used for five main reasons. First, the PLS-SEM technique is applicable even if the sample size is small as opposed to the CB-SEM technique. Second, this technique is a non-parametric one that does not make any assumptions about the distribution of data as compared to CB-SEM technique. Third, this technique can be used to assess the measurement model as well as the structural model. Furthermore, this technique is suitable to investigate complex relationships among different variables. Finally, this technique has greater statistical power, compared to the CB-SEM technique, meaning that it is more likely to

conclude that a given relationship is significant when it is in fact significant in the population.

Partial least squares structural equation modelling (PLS-SEM) consists of two steps. The first is assessing the measurement model (also called the outer model) which represents the relationships between the variables and their items. The second is assessing the structural model (also referred to as the inner model) which represents the relationships between different variables. These two steps are carried out in the next chapter.

There are two main types of measurement models. They are reflective and formative measurement models. In reflective measurement models, items represent the effects of a given variable. Thus, causality is from the variable to its items. Reflective items can be seen as a representative sample of all the possible items available within the conceptual domain of the variable (Nunnally & Bernstein, 1994). Therefore, since reflective items mean that all items are caused by the same variable, items associated with a given variable should be highly correlated with each other. Furthermore, individual items should be interchangeable, and any item can normally be removed without changing the meaning of the variable, provided that the variable has adequate reliability.

Conversely, formative measurement models assumes that causal items form the variable by means of linear combinations. An important feature of formative items is that they are not interchangeable, as is the case with reflective items. Therefore, each item for a formative variable taps a specific aspect of the variable's domain. Taken together, the items eventually define the meaning of the variable, which indicates that removing an item potentially alters the nature of the variable. Consequently, extent of coverage of the variable domain is very important to make sure that the content of the variable is sufficiently captured (Diamantopoulos & Winklhofer, 2001).

In this study, a hierarchal component model (HCM) is estimated. The reason is that two of the variables in the model are complex in that they are operationalized at more than one level of abstraction. More specifically, supply chain management is measured using four first-order dimensions (i.e. strategic supplier partnership, customer relationship, level of information sharing, and quality of information sharing). Similarly, price/cost, delivery dependability, product quality, product innovation, and time to market are the first-order dimensions that form the second-order variable of competitive advantage.

Two approaches are used when modelling hierarchy component models (HCMs). They are the repeated indicators approach and the two-stage hierarchy component approach. In the first approach, all the items from the lower-order components (LOCs) are assigned to the higher-order components (HOCs) to form the higher-order components (HOCs) measurement model. However, when modeling hierarchy component models (HCMs) using this approach, nearly all of the higher-order component (HOC) variance is explained by its lower-order component (LOCs), giving an R^2 value of (close to) 1. Consequently, any further path coefficients (i.e., excluding those by the LOCs) for relationships pointing at the higher-order component (HOC) will be very small (and perhaps zero) and insignificant (Ringle et al., 2012).

To overcome this problem, a combination of the repeated indicators approach and the use of the latent variable scores in a two-stage HCM analysis is applied. In the first stage, the repeated indicator approach is used to obtain the latent variable scores for the LOCs. In the second stage, the LOC scores serve as manifest variables in the HOC measurement model. The two-stage HCM analysis can then identify significant path relationships that may not otherwise be found.

The partial least squares (PLS) approach to structural equation modelling (SEM) is primarily based on the two procedures of bootstrapping and blindfolding. Using the bootstrapping procedure, subsamples are randomly drawn (with replacement) from the original data set. Each subsample is then used to estimate the model. This process is repeated until a large number of random subsamples are created, typically about 5,000. The estimated parameters from the subsamples are used to derive standard errors for the estimates.

On the other hand, the blindfolding procedure is used to obtain the predictive relevance (Q^2) value for a specified omission distance D. Blindfolding is a sample reuse technique that omits every d^{th} data point in the dependent variable's items and estimates the parameters with the remaining data points (Henseler et al., 2009). The omitted data points are considered missing values and treated accordingly when running the PLS-SEM algorithm. The resulting estimates are then used to predict the omitted data points. The difference between the true (i.e., omitted) data points and the predicted ones is then used as input for the Q^2 measure. Blindfolding is an iterative process that repeats until each data point has been omitted and the model re-estimated.

4.7 Data Analysis Software

After primary data are collected, they are coded, edited, and entered into the SPSS and Smart-PLS to be analyzed.

4.8 Ethical Considerations

Some ethical considerations are worth highlighting regarding this study. First of all, the purpose of the study is explained to respondents at the questionnaire introduction. In addition, the primary data submitted by respondents are treated as strictly confidential. Moreover, no misrepresentation or distortion are intentionally made in reporting the data gathered during the study. Finally, there is no conflict of interest between the research from one hand and any other party from the other hand.

CHAPTER FIVE

DATA ANALYSIS AND DISCUSSION

5.1 Respondents' Profile

This section aims to present and discuss respondents' characteristics in terms of their gender, age, educational level, years of experience, job title, and job responsibilities.

Respondents' characteristics are shown in Table 5.1.

Table 5.1 indicates that roughly 80% of respondents are males while the remaining 20% of them are females. With respect to age groups, 2% of respondents are under 25 years, 51% are between 25-35 years, 39% are between 36-45 years, 4% are between 46-55 years, and also 4% are over 55 years.

In terms of educational level, Table 5.1 indicates that 6% of respondents have less than Diploma degree, 18% hold Diploma degree, 65% hold BA degree, 12% hold Master's degree, and none of them holds PhD.

The distribution of sample respondents according to years of experience at Starwood Industries indicates that 53% of them have 1-5 years of experience, 26% have 6-10 years of experience, 14% have 11-15 years of experience, and 8% have more than 15 years of experience.

Regarding job title, Table 5.1 indicates that 45% are employees, 22% are head divisions, and the remaining 33% are unit managers.

Finally, Table 5.1 indicates that 22% have finance or administrative responsibilities, 12% have purchase or procurement responsibilities, 16% have production or operation responsibilities, 35% have product development responsibilities, 6% have sales or marketing responsibilities, 4% have logistics or distribution responsibilities, 4% have quality management responsibilities, and only 2% have IT responsibilities.

Table 5.1
Respondents' Characteristics

Variable	Category	Frequency	Percentage (%)
Gender	Male	41	80.4
	Female	10	19.6
Age	Under 25	1	2.0
	25–35	26	51.0
	36–45	20	39.2
	46–55	2	3.9
	Over 55	2	3.9
Educational level	Below diploma	3	5.9
	Diploma	9	17.6
	BA	33	64.7
	Master's	6	11.8
Years of experience	1–5	27	52.9
	6–10	13	25.5
	11–15	7	13.7
	More than 15	4	7.9
Job Title	Employee	23	45.1
	Division head	11	21.6
	Unit manager	17	33.3
Job responsibilities	Finance/admin	11	21.6
	Purchase/procurement	6	11.8
	Production/operation	8	15.7
	Product development	18	35.3
	Sales/marketing	3	5.9
	Logistics/distribution	2	3.9
	Quality Management	2	3.9
	IT	1	2.0

5.2 Level of Supply Chain Management in Starwood Industries

In this section, the level of supply chain management in Starwood Industries is analyzed using descriptive statistics such as minimums, maximums, standard deviations, and means. The descriptive statistics of supply chain management at Starwood Industries are shown in Table 5.2.

Table 5.2 indicates that Starwood Industries has an excellent overall level of supply chain management with a score of 4.19 out of a maximum of 5 from the viewpoints of its office employees working in the company's headquarters in Dubai, UAE.

In detail, the strategic supplier partnership has an excellent level with a score of 4.15 out of a maximum of 5. In addition, the customer relationship has an excellent level with a score of 4.27 out of a maximum of 5. Moreover, the level of information sharing has an excellent level with a score of 4.14 out of a maximum of 5. Finally, the quality of information sharing has an excellent level with a score of 4.19 out of a maximum of 5.

It is worth noting that customer relationship and quality of information sharing are the most two implemented dimensions of supply chain management practices in Starwood Industries whereas strategic supplier partnership and level of information sharing are the least two implemented dimensions.

Table 5.2
Descriptive Statistics of Supply Chain Management

Item	Minimum	Maximum	Std. Deviation	Mean	Evaluation
Dimension 1: Strategic supplier partnership					
SSP1	3	5	0.703	4.47	Excellent
SSP2	2	5	0.839	4.24	Excellent
SSP3	2	5	0.878	4.10	Excellent
SSP4	2	5	0.840	4.12	Excellent
SSP5	2	5	0.904	3.94	Excellent
SSP6	2	5	0.785	4.06	Excellent
Subtotal				4.15	Excellent

Table 5.2
Descriptive Statistics of Supply Chain Management

Item	Minimum	Maximum	Std. Deviation	Mean	Evaluation
Dimension 2: Customer relationship					
CR1	3	5	0.712	4.33	Excellent
CR2	3	5	0.750	4.39	Excellent
CR3	3	5	0.729	4.29	Excellent
CR4	2	5	0.809	4.16	Excellent
CR5	3	5	0.775	4.20	Excellent
Subtotal				4.27	Excellent
Dimension 3: Level of information sharing					
LIS1	1	5	0.816	4.33	Excellent
LIS2	1	5	0.855	4.10	Excellent
LIS3	1	5	0.825	4.20	Excellent
LIS4	1	5	0.881	4.06	Excellent
LIS5	1	5	0.925	4.16	Excellent
LIS6	1	5	1.068	3.98	Excellent
Subtotal				4.14	Excellent
Dimension 4: Quality of information sharing					
QIS1	1	5	0.979	4.04	Excellent
QIS2	1	5	0.934	4.35	Excellent
QIS3	1	5	0.969	4.02	Excellent
QIS4	1	5	0.980	4.20	Excellent
QIS5	1	5	0.934	4.35	Excellent
Subtotal				4.19	Excellent
Total				4.19	Excellent

These previous results are summarized in Figure 5.1

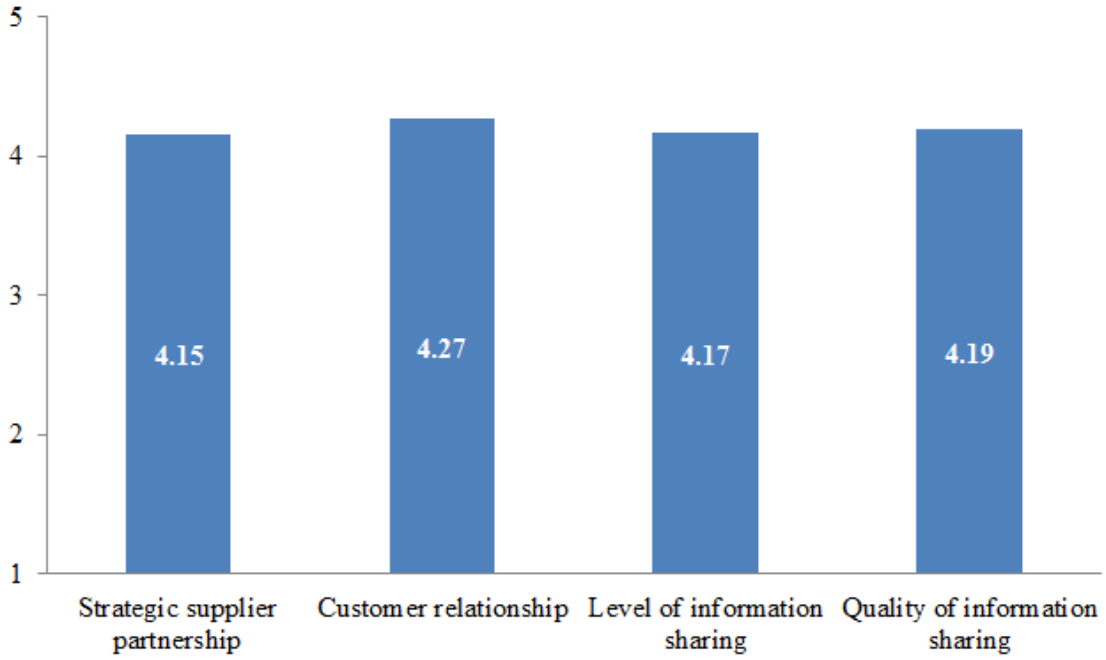

Figure 5.1: Respondents' Perceptions of Supply Chain Management

To examine if respondents' perceptions of the level of supply chain management at Starwood Industries vary due to their characteristics, the t-test and the one-way ANOVA are used as shown in the following pages. In this context, it is useful to say that the t-test is used when the independent variable has only two groups whereas the one-way ANOVA is used when the independent variable has more than two groups (i.e. multiple groups).

Supply Chain Management by Gender

To examine if respondents' perceptions of the level of supply chain management at Starwood Industries vary due to their gender, the t-test is used. This test is selected since we are interested in comparing the means of an interval dependent variable (level of supply chain management) between two independent groups (male and female).

Table 5.3 shows the descriptive statistics for respondents' perceptions of the level of supply chain management at Starwood Industries according to their gender.

Table 5.3
Level of Supply Chain Management by Gender

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Male	41	4.1707	0.55650	0.08691
Female	10	4.2455	0.65947	0.20854

Table 5.3 indicates that the mean perceptions of supply chain management at Starwood Industries is roughly 4.17 and 4.25 for male and female, respectively. These figures indicate that females have higher perceptions of supply chain management than males do. To test this result formally, the t-test is used as shown in Table 5.4.

Table 5.4
T-Test for Supply Chain Management by Gender

	Levene's Test for Equality of Variances		T-Test for Equality of Means		
	F	Sig.	t	df	Sig.
Equal variances	0.803	0.375	-0.367	49	0.715
Unequal variances			-0.331	12.314	0.746

By looking at the significance column under the t-test for equality of means in Table 5.4, it is concluded that the difference in the respondents' mean perception of supply chain management due to gender is not significant at the 0.05 level.

Supply Chain Management by Age

To examine if respondents' perceptions of the level of supply chain management at Starwood Industries vary due to their age, the one-way ANOVA is used. This test is chosen since we are interested in comparing the means of an interval dependent variable (level of supply chain management) between more than two independent groups (five age groups).

Table 5.5 shows the descriptive statistics for respondents' perceptions of the level of supply chain management at Starwood Industries according to their age groups.

Table 5.5
Level of Supply Chain Management by Age

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Under 25	1	4.0909		
25-35	26	4.1538	0.52304	0.10258
36-45	20	4.2205	0.63846	0.14276
46-55	2	3.7727	0.83567	0.59091
Over 55	2	4.7075	0.35355	0.25000

Table 5.5 indicates that the mean perceptions of supply chain management at Starwood Industries is roughly 4.09, 4.15, 4.22, 3.77, and 4.71 for employees who are under 25, 25-35, 36-45, 46-55, and over 55, respectively. Generally speaking, these figures indicate that older employees have higher perceptions of supply chain management. To test this result formally, the one-way ANOVA is used as shown in Table 5.6.

Table 5.6
ANOVA for Supply Chain Management by Age

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	0.939	4	0.235	0.701	0.595
Within	15.407	46	0.335		
Total	16.346	50			

As shown in Table 5.6, the variance in the respondents' mean perception of the level of supply chain management due to their age is not significant at the 0.05 level.

Supply Chain Management by Educational Level

To examine if respondents' perceptions of the level of supply chain management at Starwood Industries vary due to their education, the one-way ANOVA is used. This test is chosen since we are interested in comparing the means of an interval dependent variable (level of supply chain management) between more than two independent groups (four educational levels).

Table 5.7 shows the descriptive statistics for respondents' perceptions of the level of supply chain management at Starwood Industries according to their educational level.

Table 5.7
Level of Supply Chain Management by Educational Level

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Below diploma	3	4.3030	0.11439	0.6604
Diploma	9	4.2727	0.50463	0.16821
BA	33	4.1804	0.65511	0.11404
Master's	6	4.0227	0.23663	0.09660

Table 5.7 indicates that the mean perceptions of supply chain management at Starwood Industries is roughly 4.30 for employees with below diploma, 4.27 for employees with diploma, 4.18 for employees with BA, and 4.02 for employees with Master's, respectively. These figures indicate that employees with higher educational levels have lower perceptions of supply chain management. To test this result formally, the one-way ANOVA is used as shown in Table 5.8.

Table 5.8
ANOVA for Supply Chain Management by Educational Level

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	0.270	3	0.090	0.263	0.852
Within	16.077	47	0.342		
Total	16.346	50			

As shown in Table 5.8, the variance in the respondents' mean perception of the level of supply chain management due to their educational level is not significant at the 0.05 level.

Supply Chain Management by Years of Experience

To examine if respondents' perceptions of the level of supply chain management at Starwood Industries vary due to their years of experience, the one-way ANOVA is used. This test is selected since we are interested in comparing the means of an interval

dependent variable (level of supply chain management) between more than two independent groups (five groups of years of experience).

Table 5.9 shows the descriptive statistics for respondents' perceptions of the level of supply chain management at Starwood Industries according to their years of experience at the company.

Table 5.9
Level of Supply Chain Management by Years of Experience

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
1-5	27	4.1414	0.51724	0.09954
6-10	13	4.2657	0.50713	0.14065
11-15	7	4.4221	0.35279	0.13334
16-20	3	3.6818	1.46092	0.84346
More than 20	1	4.1818		

Table 5.9 indicates that the mean perceptions of supply chain management at Starwood Industries is roughly 4.14 for employees with 1-5 years of experience, 4.27 for employees with 6-10 years of experience, 4.42 for employees with 11-15 years of experience, and 3.68 for employees with 16-20 years of experience, and 4.18 for employees with more than 20 years of experience, respectively. To test if the variance in these figures is statistically significant, the one-way ANOVA is used as shown in Table 5.10.

Table 5.10
ANOVA for Supply Chain Management by Years of Experience

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	1.289	4	0.322	0.985	0.425
Within	15.057	46	0.327		
Total	16.346	50			

As shown in Table 5.10, the variance in the respondents' mean perceptions of the level of supply chain management due to their years of experience is not significant at the 0.05 level.

Supply Chain Management by Job Title

To examine if respondents' perceptions of the level of supply chain management at Starwood Industries vary due to their job title, the one-way ANOVA is used. This test is selected since we are interested in comparing the means of an interval dependent variable (level of supply chain management) between more than two independent groups (three groups of job titles).

Table 5.11 shows the descriptive statistics for respondents' perceptions of the level of supply chain management at Starwood Industries according to their job titles.

Table 5.11
Level of Supply Chain Management by Job Title

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Employee	23	4.0198	0.63928	0.13330
Division head	11	4.5289	0.41275	0.12445
Unit manager	17	4.1872	0.48235	0.11699

Table 5.11 indicates that the mean perceptions of supply chain management at Starwood Industries is roughly 4.02 for employees, 4.53 for division heads, and 4.19 for unit managers, respectively. To test if the variance in these figures is statistically significant, the one-way ANOVA is used as shown in Table 5.12.

Table 5.12
ANOVA for Supply Chain Management by Job Title

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	1.929	2	0.965	3.211	0.049
Within	14.417	48	0.300		
Total	16.346	50			

As shown in Table 5.12, the variance in the respondents' mean perceptions of the level of supply chain management due to their job title is significant at the 0.05 level.

To examine among which job title groups the true differences lie, the Turkey HSD test is performed as shown in Table 5.13.

The results in Table 5.13 show that the mean difference is significant between employees and division heads at the .05 level. This means that division heads at Starwood Industries have higher perceptions of supply chain management than employees do.

Table 5.13
Supply Chain Management by Job Title - Multiple Comparisons

Job Title (I)	Job Title (J)	Mean Difference	Std. Error	Sig.
Employee	Division head	-0.50916	0.20091	0.038*
	Unit manager	-0.16740	0.17529	0.609
Division head	Employee	0.50916	0.20091	0.038*
	Unit manager	0.34176	0.21207	0.251
Unit manager	Employee	0.16740	0.17529	0.609
	Division head	-0.34176	0.21207	0.251

* The mean difference is significant at the 0.05 level.

Supply Chain Management by Job Responsibilities

To examine if respondents' perceptions of the level of supply chain management at Starwood Industries vary due to their responsibilities, the one-way ANOVA is used. This test is selected since we are interested in comparing the means of an interval dependent variable (level of supply chain management) between more than two independent groups (eight groups of job responsibilities).

Table 5.14 shows the descriptive statistics for respondents' perceptions of the level of supply chain management at Starwood Industries according to their job responsibilities.

Table 5.14
Level of Supply Chain Management by Job Responsibilities

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Finance / admin	11	4.0455	0.74579	0.22486
Production	8	4.1250	0.60534	0.21402
Distribution	2	4.7273	0.38569	0.27273
Purchasing	6	4.1288	0.83340	0.34024
Sales	3	4.3182	0.43361	0.25034
Product development	18	4.1995	0.38637	0.09107
IT	1	3.8182		
Quality management	2	4.6818	0.38569	0.27273

As indicated in Table 5.14, the mean perceptions of supply chain management at Starwood Industries is roughly 4.05 for employees with finance/admin responsibilities, 4.13 for employees with production responsibilities, 4.72 for employees with distribution responsibilities, 4.13 for employees with purchasing responsibilities, 4.32 for employees with sales responsibilities, 4.20 for employees with product development responsibilities, 3.82 for employees with IT responsibilities, and 4.67 for employees with quality management responsibilities, respectively. To test if the variance in these figures is statistically significant, the one-way ANOVA is used as shown in Table 5.15.

Table 5.15
ANOVA for Supply Chain Management by Job Responsibilities

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	1.535	7	0.219	0.637	0.723
Within	14.811	43	0.344		
Total	16.346	50			

As shown in Table 5.15, the variance in the respondents' mean perceptions of the level of supply chain management due to their job responsibilities is not significant at the 0.05 level.

5.3 Level of Competitive Advantage in Starwood Industries

This section analyzes the level of competitive advantage in Starwood Industries using descriptive statistics such as minimums, maximums, standard deviations, and means.

Descriptive statistics of competitive advantage at Starwood Industries are shown in Table 5.16.

Table 5.16
Descriptive Statistics of Competitive Advantage

Item	Minimum	Maximum	Std. Deviation	Mean	Evaluation
Dimension 1: Price/cost					
P/C1	3	5	0.644	4.51	Excellent
P/C2	3	5	0.726	4.41	Excellent
Subtotal				4.46	Excellent
Dimension 2: Product quality					
Q1	3	5	0.610	4.55	Excellent
Q2	2	5	0.792	4.33	Excellent
Q3	3	5	0.608	4.57	Excellent
Q4	3	5	0.669	4.41	Excellent
Subtotal				4.47	Excellent
Dimension 3: Delivery dependability					
DD1	3	5	0.669	4.59	Excellent
DD2	3	5	0.731	4.53	Excellent
DD3	1	5	0.807	4.29	Excellent
Subtotal				4.47	Excellent
Dimension 4: Product innovation					
PI1	1	5	1.006	4.29	Excellent
PI2	3	5	0.702	4.45	Excellent

Table 5.16 Descriptive Statistics of Competitive Advantage					
Item	**Minimum**	**Maximum**	**Std. Deviation**	**Mean**	**Evaluation**
PI3	1	5	1.036	4.25	Excellent
Subtotal				4.33	Excellent
Dimension 5: Time to market					
TTM1	3	5	0.644	4.49	Excellent
TTM2	1	5	0.938	4.00	Excellent
TTM3	1	5	1.006	3.78	Excellent
TTM4	3	5	0.678	4.31	Excellent
Subtotal				4.15	Excellent
Total				4.36	Excellent

Table 5.16 indicates that Starwood Industries has an excellent position of competitive advantage with a score of 4.36 out of a maximum of 5 from the viewpoints of its office employees working in the company's headquarters in Dubai, UAE.

In depth, the price/cost dimension has an excellent level with a score of 4.46 out of a maximum of 5. In addition, product quality has an excellent level with a score of 4.47 out of a maximum of 5. Delivery dependability also has an excellent level with a score of 4.47 out of a maximum of 5. Furthermore, product innovation has an excellent level with a score of 4.33 out of a maximum of 5. Finally, the company has time to market of an excellent level with a score of 4.36 out of a maximum of 5.

Tables 5.16 also indicates that price/cost, product quality, and delivery dependability are the most important competitive advantage dimensions of Starwood Industries while product innovation and time to market are less important in this context.

The previous results are summarized in Figure 5.2.

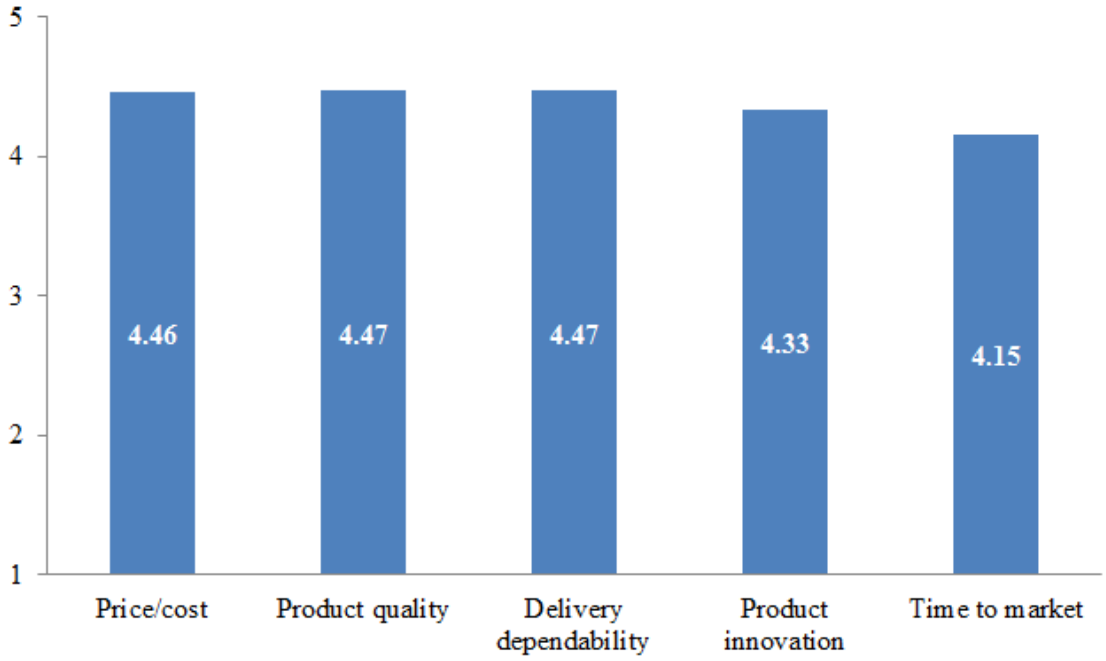

Figure 5.2: Respondents' Perceptions of Competitive Advantage

To examine if respondents' perceptions of the level of competitive advantage at Starwood Industries vary due to their characteristics, the t-test and the one-way ANOVA are used as shown in the following pages.

Competitive Advantage by Gender

To examine if respondents' perceptions of the level of competitive advantage at Starwood Industries vary due to their gender, the t-test is used. This test is selected since we are interested in comparing the means of an interval dependent variable (level of competitive advantage) between two independent groups (male and female).

Table 5.17 shows the descriptive statistics for respondents' perceptions of the level of competitive advantage at Starwood Industries according to their gender.

Table 5.17
Level of Competitive Advantage by Gender

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Male	41	4.3857	0.38753	0.06052
Female	10	4.2625	0.65604	0.20746

Table 5.17 indicates that the mean perceptions of competitive advantage at Starwood Industries is roughly 4.39 and 4.26 for male and female, respectively. These figures indicate that males have higher perceptions of competitive advantage than females do. To test this result formally, the t-test is used as shown in Table 5.18.

Table 5.18
T-Test for Competitive Advantage by Gender

	Levene's Test for Equality of Variances		T-Test for Equality of Means		
	F	**Sig.**	**t**	**df**	**Sig.**
Equal variances	5.763	0.020	0.778	49	0.440
Unequal variances			0.570	10.580	0.581

By looking at the significance column under the t-test for equality of means in Table 5.18, it is concluded that the difference in the respondents' mean perception of competitive advantage due to gender is not significant at the 0.05 level.

Competitive Advantage by Age

To examine if respondents' perceptions of the level of competitive advantage at Starwood Industries vary due to their age, the one-way ANOVA is used. This test is chosen since we are interested in comparing the means of an interval dependent variable (level of competitive advantage) between more than two independent groups (five age groups).

Table 5.19 shows the descriptive statistics for respondents' perceptions of the level of competitive advantage at Starwood Industries according to their age groups.

Table 5.19 indicates that the mean perceptions of competitive advantage at Starwood Industries is roughly 3.81, 4.32, 4.50, 3.66, and 4.44 for employees who are under 25, 25-35, 36-45, 46-55, and over 55, respectively.

Table 5.19
Level of Competitive Advantage by Age

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Under 25	1	3.8125		
25-35	26	4.3245	0.48316	0.09476
36-45	20	4.5000	0.34946	0.07814
46-55	2	3.6563	0.22097	0.15625
Over 55	2	4.4375	0.26517	0.18750

To test if this variation is statistically significant, the one-way ANOVA is used as shown in Table 5.20.

Table 5.20
ANOVA for Competitive Advantage by Age

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	1.727	4	0.432	2.400	0.064
Within	8.276	46	0.180		
Total	10.002	50			

As shown in Table 5.20, the variance in the respondents' mean perception of the level of competitive advantage due to their age is not significant at the 0.05 level.

Competitive Advantage by Educational Level

To examine if respondents' perceptions of the level of competitive advantage at Starwood Industries vary due to their education, the one-way ANOVA is used. This test is chosen since we are interested in comparing the means of an interval dependent variable (level of competitive advantage) between more than two independent groups (four educational levels).

Table 5.21 shows the descriptive statistics for respondents' perceptions of the level of competitive advantage at Starwood Industries according to their educational level.

Table 5.21
Level of Competitive Advantage by Educational Level

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Below diploma	3	4.6875	0.34799	0.20091
Diploma	9	4.3472	0.37253	0.12418
BA	33	4.3466	0.48791	0.08493
Master's	6	4.3021	0.36958	0.15088

Table 5.21 indicates that the mean perceptions of competitive advantage at Starwood Industries is roughly 4.69 for employees with below diploma, 4.35 for employees with diploma, 4.35 for employees with BA, and 4.30 for employees with Master's, respectively. These figures indicate that employees with higher educational levels have lower perceptions of competitive advantage. To test this result formally, the one-way ANOVA is used as shown in Table 5.22.

Table 5.22
ANOVA for Competitive Advantage by Educational Level

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	0.349	3	0.116	0.567	0.640
Within	9.653	47	0.205		
Total	10.002	50			

As shown in Table 5.22, the variance in the respondents' mean perceptions of the level of competitive advantage due to their educational level is not significant at the 0.05 level.

Competitive Advantage by Years of Experience

To examine if respondents' perceptions of the level of competitive advantage at Starwood Industries vary due to their years of experience, the one-way ANOVA is used. This test is chosen since we are interested in comparing the means of an interval dependent variable (level of competitive advantage) between more than two independent groups (five groups of years of experience).

Table 5.23 shows the descriptive statistics for respondents' perceptions of the level of competitive advantage at Starwood Industries according to their years of experience at the company.

Table 5.23
Level of Competitive Advantage by Years of Experience

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
1-5	27	4.2847	0.46814	0.09009
6-10	13	4.3510	0.46389	0.12866
11-15	7	4.5446	0.35670	0.13482
16-20	3	4.6875	0.34799	0.20091
More than 20	1	4.3125		

Table 5.23 indicates that the mean perceptions of competitive advantage at Starwood Industries is roughly 4.28 for employees with 1-5 years of experience, 4.35 for employees with 6-10 years of experience, 4.54 for employees with 11-15 years of experience, and 4.69 for employees with 16-20 years of experience, and 4.31 for employees with more than 20 years of experience, respectively. To test if the variance in these figures is statistically significant, the one-way ANOVA is used as shown in Table 5.24.

As shown in Table 5.24, the variance in the respondents' mean perceptions of the level of competitive advantage due to their years of experience is not significant at the 0.05 level.

Table 5.24
ANOVA for Competitive Advantage by Years of Experience

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	0.717	4	0.179	0.887	0.479
Within	9.286	46	0.202		
Total	10.002	50			

Competitive Advantage by Job Title

To examine if respondents' perceptions of the level of competitive advantage at Starwood Industries vary due to their job title, the one-way ANOVA is used. This test is selected since we are interested in comparing the means of an interval dependent variable (level of competitive advantage) between more than two independent groups (three groups of job titles).

Table 5.25 shows the descriptive statistics for respondents' perceptions of the level of competitive advantage at Starwood Industries according to their job titles.

Table 5.25
Level of Competitive Advantage by Job Title

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Employee	23	4.2745	0.47214	0.09845
Division head	11	4.5000	0.52440	0.15811
Unit manager	17	4.3897	0.34906	0.08466

Table 5.25 indicates that the mean perceptions of competitive advantage at Starwood Industries is roughly 4.27 for employees, 4.50 for division heads, and 4.39 for unit managers, respectively. To test if the variance in these figures is statistically significant, the one-way ANOVA is used as shown in Table 5.26.

As shown in Table 5.26, the variance in the respondents' mean perceptions of the level of competitive advantage due to their job title is not significant at the 0.05 level.

Table 5.26
ANOVA for Competitive Advantage by Job Title

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	0.399	2	0.199	0.997	0.377
Within	9.604	48	0.200		
Total	10.002	50			

Competitive Advantage by Job Responsibilities

To examine if respondents' perceptions of the level of competitive advantage at Starwood Industries vary due to their responsibilities, the one-way ANOVA is used. This test is selected since we are interested in comparing the means of an interval dependent variable (level of competitive advantage) between more than two independent groups (eight groups of job responsibilities).

Table 5.27 shows the descriptive statistics for respondents' perceptions of the level of competitive advantage at Starwood Industries according to their job responsibilities.

Table 5.27
Level of Competitive Advantage by Job Responsibilities

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Finance / admin	11	4.4205	0.30245	0.09119
Production	8	4.3594	0.49636	0.17549
Distribution	2	4.8125	0.26517	0.18750
Purchasing	6	4.4583	0.74861	0.30562
Sales	3	4.2708	0.72439	0.41823
Product development	18	4.2396	0.38542	0.09085
IT	1	4.5625		
Quality management	2	4.4375	0.26517	0.18750

As indicated in Table 5.27, the mean perceptions of competitive advantage at Starwood Industries is roughly 4.42 for employees with finance/admin responsibilities, 4.36 for employees with production responsibilities, 4.81 for employees with distribution responsibilities, 4.46 for employees with purchasing responsibilities, 4.27 for employees with sales responsibilities, 4.24 for employees with product development responsibilities, 44.56 for employees with IT responsibilities, and 4.44 for employees with quality management responsibilities, respectively. To test if the variance in these figures is statistically significant, the one-way ANOVA is used as shown in Table 5.28.

Table 5.28
ANOVA for Competitive Advantage by Job Responsibilities

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	0.845	7	0.121	0.567	0.778
Within	9.157	43	0.213		
Total	10.002	50			

As shown in Table 5.28, the variance in the respondents' mean perceptions of the level of competitive advantage due to their job responsibilities is not significant at the 0.05 level.

5.4 Level of Organizational Performance in Starwood Industries

This section analyzes the level of organizational performance in Starwood Industries using descriptive statistics such as minimums, maximums, standard deviations, and means as shown in Table 5.29.

Table 5.29
Descriptive Statistics of Organizational Performance

Item	Minimum	Maximum	Std. Deviation	Mean	Evaluation
OP1	2	5	0.755	4.10	Excellent
OP2	2	5	0.848	3.96	Excellent
OP3	2	5	0.824	4.04	Excellent
OP4	2	5	0.781	4.10	Excellent
OP5	2	5	0.868	3.92	Excellent
OP6	2	5	0.836	3.69	Excellent
OP7	2	5	0.817	4.18	Excellent
Total				4.00	Excellent

As indicated in Table 5.29, Starwood Industries has an excellent level of organizational performance with a score of 4.00 out of a maximum of 5 from the viewpoints of its

office employees working in the company's headquarters in Dubai, UAE. The above results are summarized in Figure 5.3.

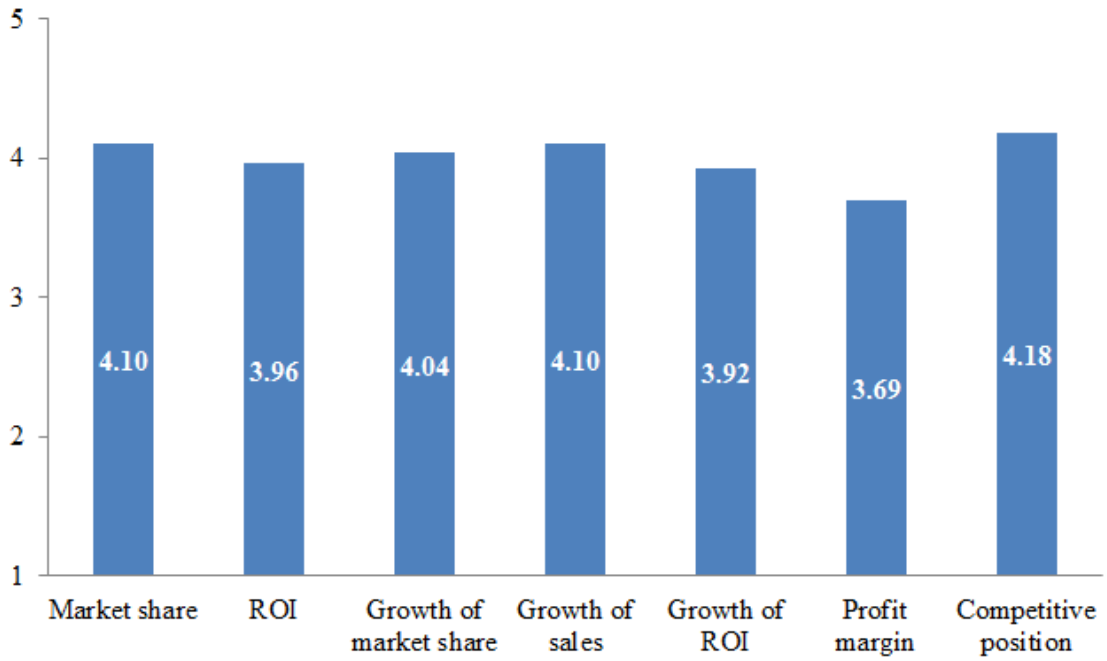

Figure 5.3: Respondents' Perception of Organizational Performance

To examine if respondents' perceptions of the level of organizational performance at Starwood Industries vary due to their characteristics, the t-test and the one-way ANOVA are used as shown in the following pages.

Organizational Performance by Gender

To examine if respondents' perceptions of the level of organizational performance at Starwood Industries vary due to their gender, the t-test is used. This test is selected since we are interested in comparing the means of an interval dependent variable (level of organizational performance) between two independent groups (male and female).

Table 5.30 shows the descriptive statistics for respondents' perceptions of the level of organizational performance at Starwood Industries according to their gender.

Table 5.30 indicates that the mean perceptions of organizational performance at Starwood Industries is roughly 3.95 and 4.17 for male and female, respectively. These figures indicate that males have lower perceptions of organizational performance than females do.

Table 5.30
Level of Organizational Performance by Gender

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Male	41	3.9547	0.61813	0.09654
Female	10	4.1714	0.77313	0.24449

To test the above results formally, the t-test is used as shown in Table 5.31.

Table 5.31
T-Test for Organizational Performance by Gender

	Levene's Test for Equality of Variances		T-Test for Equality of Means		
	F	Sig.	t	df	Sig.
Equal variances	2.619	0.112	-0.946	49	0.349
Unequal variances			-0.825	11.960	0.426

By looking at the significance column under the t-test for equality of means in Table 5.31, it is concluded that the difference in the respondents' mean perception of organizational performance due to gender is not significant at the 0.05 level.

Organizational Performance by Age

To examine if respondents' perceptions of the level of organizational performance at Starwood Industries vary due to their age, the one-way ANOVA is used. This test is chosen since we are interested in comparing the means of an interval dependent variable (level of organizational performance) between more than two independent groups (five age groups).

Table 5.32 shows the descriptive statistics for respondents' perceptions of the level of organizational performance at Starwood Industries according to their age groups.

Table 5.32 indicates that the mean perceptions of organizational performance at Starwood Industries is roughly 3.43, 3.98, 4.04, 3.57, and 4.21 for employees who are under 25, 25-35, 36-45, 46-55, and over 55, respectively.

Table 5.32
Level of Organizational Performance by Age

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Under 25	1	3.4286		
25-35	26	3.9835	0.72655	0.14249
36-45	20	4.0643	0.59442	0.13292
46-55	2	3.5714	0.40406	0.28571
Over 55	2	4.2143	0.30305	0.21429

To test if this variation is statistically significant, the one-way ANOVA is used as shown in Table 5.33.

Table 5.33
ANOVA for Organizational Performance by Age

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	0.875	4	0.219	0.499	0.737
Within	20.165	46	0.438		
Total	21.040	50			

As shown in Table 5.33, the variance in the respondents' mean perception of the level of organizational performance due to their age is not significant at the 0.05 level.

Organizational Performance by Educational Level

To examine if respondents' perceptions of the level of organizational performance at Starwood Industries vary due to their education, the one-way ANOVA is used. This test is chosen since we are interested in comparing the means of an interval dependent variable (level of organizational performance) between more than two independent groups (four educational levels).

Table 5.34 shows the descriptive statistics for respondents' perceptions of the level of organizational performance at Starwood Industries according to their educational level.

Table 5.34
Level of Organizational Performance by Educational Level

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Below diploma	3	4.3333	0.57735	0.33333
Diploma	9	3.6349	0.55380	0.18460
BA	33	4.1299	0.62614	0.10900
Master's	6	3.6429	0.70999	0.28985

Table 5.34 indicates that the mean perceptions of organizational performance at Starwood Industries is roughly 4.33 for employees with below diploma, 3.63 for employees with diploma, 4.13 for employees with BA, and 3.64 for employees with Master's, respectively. To test if the variance in these figures is statistically significant, the one-way ANOVA is used as shown in Table 5.35.

Table 5.35
ANOVA for Organizational Performance by Educational Level

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	2.854	3	0.951	2.459	0.074
Within	18.186	47	0.387		
Total	21.040	50			

As shown in Table 5.35, the variance in the respondents' mean perceptions of the level of organizational performance due to their educational level is not significant at the 0.05 level.

Organizational Performance by Years of Experience

To examine if respondents' perceptions of the level of organizational performance at Starwood Industries vary due to their years of experience, the one-way ANOVA is used. This test is chosen since we are interested in comparing the means of an interval dependent variable (level of organizational performance) between more than two independent groups (five groups of years of experience).

Table 5.36 shows the descriptive statistics for respondents' perceptions of the level of organizational performance at Starwood Industries according to their years of experience at the company.

Table 5.36
Level of Organizational Performance by Years of Experience

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
1-5	27	4.0000	0.72627	0.13977
6-10	13	4.0659	0.61061	0.16935
11-15	7	3.8163	0.49290	0.18630
16-20	3	3.9524	0.67512	0.38978
More than 20	1	4.4286		

Table 5.36 indicates that the mean perceptions of organizational performance at Starwood Industries is 4.00 for employees with 1-5 years of experience, 4.07 for employees with 6-10 years of experience, 3.82 for employees with 11-15 years of experience, and 3.95 for employees with 16-20 years of experience, and 4.43 for employees with more than 20 years of experience, respectively. To test if the variance in these figures is statistically significant, the one-way ANOVA is used as shown in Table 5.37.

Table 5.37
ANOVA for Organizational Performance by Years of Experience

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	0.483	4	0.121	0.270	0.896
Within	20.558	46	0.447		
Total	21.040	50			

As shown in Table 5.37, the variance in the respondents' mean perceptions of the level of organizational performance due to their years of experience is not significant at the 0.05 level.

Organizational Performance by Job Title

To examine if respondents' perceptions of the level of organizational performance at Starwood Industries vary due to their job title, the one-way ANOVA is used. This test is selected since we are interested in comparing the means of an interval dependent variable (level of organizational performance) between more than two independent groups (three groups of job titles).

Table 5.38 shows the descriptive statistics for respondents' perceptions of the level of organizational performance at Starwood Industries according to their job titles.

Table 5.38
Level of Organizational Performance by Job Title

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Employee	23	3.9938	0.72904	0.15202
Division head	11	4.1299	0.72126	0.21747
Unit manager	17	3.9160	0.48984	0.11880

Table 5.38 indicates that the mean perceptions of organizational performance at Starwood Industries is roughly 3.99 for employees, 4.13 for division heads, and 3.92 for unit managers, respectively. To test if the variance in these figures is statistically significant, the one-way ANOVA is used as shown in Table 5.39.

Table 5.39
ANOVA for Organizational Performance by Job Title

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	0.306	2	0.153	0.354	0.704
Within	20.734	48	0.432		
Total	21.040	50			

As shown in Table 5.39, the variance in the respondents' mean perceptions of the level of organizational performance due to their job title is not significant at the 0.05 level.

Organizational Performance by Job Responsibilities

To examine if respondents' perceptions of the level of organizational performance at Starwood Industries vary due to their responsibilities, the one-way ANOVA is used. This test is selected since we are interested in comparing the means of an interval dependent variable (level of organizational performance) between more than two independent groups (eight groups of job responsibilities).

Table 5.40 shows the descriptive statistics for respondents' perceptions of the level of organizational performance at Starwood Industries according to job responsibilities.

Table 5.40
Level of Organizational Performance by Job Responsibilities

Group	Sample Size	Mean	Std. Deviation	Std. Error Mean
Finance / admin	11	3.7792	0.73224	0.22078
Production	8	4.0893	0.61058	0.21587
Distribution	2	4.2143	0.30305	0.21429
Purchasing	6	3.9762	0.87326	0.35651
Sales	3	4.3333	0.50170	0.28966
Product development	18	4.0000	0.66647	0.15709
IT	1	4.0000		
Quality management	2	4.1429	0.20203	0.14286

As indicated in Table 5.40, the mean perceptions of organizational performance at Starwood Industries is roughly 3.78 for employees with finance/admin responsibilities, 4.09 for employees with production responsibilities, 4.21 for employees with distribution responsibilities, 3.98 for employees with purchasing responsibilities, 4.33 for employees with sales responsibilities, 4.00 for employees with product development responsibilities, 4.00 for employees with IT responsibilities, and 4.14 for employees with quality management responsibilities, respectively. To test if the variance in these figures is statistically significant, the one-way ANOVA is used as shown in Table 5.41.

Table 5.41
ANOVA for Organizational Performance by Job Responsibilities

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between	1.069	7	0.153	0.329	0.937
Within	19.971	43	0.464		
Total	21.040	50			

As shown in Table 5.41, the variance in the respondents' mean perceptions of the level of organizational performance due to their job responsibilities is not significant at the 0.05 level.

5.5 Assessment of Mediated Measurement Model

Before testing the first three hypotheses already developed using the partial least squares structural equation modelling (PLS-SEM) technique, it is time to assess the mediated measurement model.

When the repeated indicators approach is used to estimate the hierarchical component model (HCM), nearly all of the higher order components (HOCs) variance is explained by the lower-order components (LOCs), giving an R^2 value of 1 or close to 1. More specifically, almost all of the variance in supply chain management is explained by its four lower-order components (LOCs), giving an R^2 value of 0.995.

In the same way, the variance in competitive advantage is totally explained by its five lower-order components (LOCs), giving an R^2 value of 1. Thus, any path coefficients −except those by the lower-order components (LOCs)− for relationships pointing at the higher order components (HOC) will be very small (and maybe zero) and insignificant (Ringle et al., 2012).

To overcome the above problem, a combination of the repeated indicators approach and the use of latent variable scores in a two-stage hierarchy component modelling (HCM) is applied as explained below.

But before discussing the two-stage process, it is important to say that the sample size (51 cases) is enough to apply the partial least squares structural equation modelling (PLS-SEM) according to the 10 times rule of thumb (Barclay et al., 1995), which

requires the minimum sample size to be 10 times the maximum number of arrowheads pointing at a variable anywhere in the partial least squares (PLS) path model.

5.5.1 First Stage

In the first stage, the repeated indicators approach is used to obtain the latent variable scores for the lower-order components (LOCs). The resulting latent variable scores are used in the second stage. Convergent validity and discriminant validity are discussed below. More specifically, since the three measures used in the first stage are formative, it is appropriate to assess factor loadings, composite reliability (CR), average variance extracted (AVE), cross loadings, and Fornell-Larcker criterion**.**

Convergent Validity

Convergent validity refers to the degree to which multiple items that are used to measure the same concept are in agreement. Three tests are usually used to assess convergent validity. These are: (1) factor loading, (2) composite reliability, and (3) average variance extracted (AVE).

Factor loading indicates the proportion of indicator variance that is explained by the latent variable. Factor loading has a value between 0 and 1. Usually, items that have factor loadings less than 0.70 are eliminated from the measurement model. However, in social science studies, researchers frequently obtain weaker factor loadings (< 0.70). Instead of automatically removing an item when its loading is below 0.70, the effects of item removal should be carefully examined on the composite reliability, as well as on the content validity. Generally, items with factor loadings between 0.40 and 0.70 should be considered for removal from the scale only when deleting the item leads to an increase in the composite reliability (CR) or the average variance extracted (AVE) above the suggested threshold values. Items with very low factor loadings (below 0.40) should, however, always be eliminated from the scale.

Average variance extracted (AVE) are similar to the proportion of variance explained in factor analysis. Its value ranges between 0 and 1. According to Baggozi and Yi (1988), average variance extracted (AVE) should exceed 0.50 to suggest adequate convergent validity.

Finally, composite reliability varies between 0 and 1. Higher values of composite reliability indicate higher levels of reliability. It is generally interpreted in the same way

as Cronbach's alpha. Specifically, composite reliability values of 0.60 to 0.70 are acceptable in exploratory research.

Table 5.42 shows the convergent validity assessment of the first stage of the mediated measurement model.

As indicated in Table 5.42, all items that capture different constructs are ensured to have factor loadings according to the previously-mentioned criteria before the structural equation model is estimated. In addition, Table 5.42 indicates that each of the different constructs has average variance extracted (AVE) exceeding the minimum threshold of 0.50. Finally, each of the different constructs has composite reliability (CR) higher than the minimum acceptable level of 0.70. Therefore, it is concluded that the convergent validity of the measurement model is established according to the above three criteria.

Table 5.42
Convergent Validity of First Stage of Mediated Model

Construct	Item	Loading	AVE	CR
Supply chain management				
Strategic supplier partnership			0.509	0.861
	SSP1	0.711		
	SSP2	0.725		
	SSP3	0.649		
	SSP4	0.827		
	SSP5	0.698		
	SSP6	0.656		
Customer relationship			0.508	0.836
	CR1	0.718		
	CR2	0.653		
	CR3	0.837		
	CR4	0.686		

Table 5.42
Convergent Validity of First Stage of Mediated Model

Construct	Item	Loading	AVE	CR
	CR5	0.652		
Level of information sharing			0.622	0.908
	LIS1	0.794		
	LIS2	0.768		
	LIS3	0.780		
	LIS4	0.839		
	LIS5	0.753		
	LIS6	0.795		
Quality of information sharing			0.790	0.949
	QIS1	0.864		
	QIS2	0.902		
	QIS3	0.918		
	QIS4	0.849		
	QIS5	0.908		
	Competitive advantage			
Price/cost			0.656	0.792
	P/C1	0.796		
	P/C2	0.824		
Product quality			0.617	0.865
	Q1	0.776		
	Q2	0.875		
	Q3	0.727		
	Q4	0.758		

Table 5.42
Convergent Validity of First Stage of Mediated Model

Construct	Item	Loading	AVE	CR
Delivery dependability			0.582	0.806
	DD1	0.735		
	DD2	0.820		
	DD3	0.730		
Product innovation			0.671	0.857
	PI1	0.908		
	PI2	0.654		
	PI3	0.872		
Time to market			0.518	0.809
	TTM1	0.679		
	TTM2	0.667		
	TTM3	0.631		
	TTM4	0.877		
Organizational performance			0.629	0.921
	OP1	0.615		
	OP2	0.862		
	OP3	0.783		
	OP4	0.833		
	OP5	0.868		
	OP6	0.780		
	OP7	0.782		

Discriminant Validity

Discriminant validity refers to the extent to which a construct is truly distinct from other constructs by empirical standards. Thus, establishing discriminant validity implies that a construct is unique and captures phenomena not represented by other constructs in the model. Typically, researchers use two measures of discriminant validity. They are the cross loadings and the variable correlation.

The cross loadings approach requires the loadings of an item on its assigned dimension to be higher than its loadings on all other dimensions.

The discriminant validity assessment of the first stage of the mediated measurement model using cross loadings is shown in Table 5.43.

Table 5.43
Cross Loadings of First Stage of Mediated Model

	SSP	CR	LIS	QIS	P/C	Q	DD	PI	TTM	OP
SSP1	**0.711**	0.543	0.384	0.333	0.460	0.495	0.372	0.169	0.211	0.187
SSP2	**0.725**	0.558	0.426	0.399	0.385	0.425	0.343	0.243	0.287	0.058
SSP3	**0.649**	0.428	0.320	0.308	0.111	0.359	0.239	0.158	0.403	0.144
SSP4	**0.827**	0.590	0.447	0.412	0.528	0.399	0.324	0.261	0.317	0.143
SSP5	**0.698**	0.370	0.386	0.391	0.592	0.320	0.270	0.310	0.426	0.446
SSP6	**0.656**	0.430	0.511	0.533	0.280	0.274	0.186	0.212	0.272	0.273
CR1	0.412	**0.718**	0.523	0.412	0.136	0.283	0.237	0.116	0.344	0.332
CR2	0.517	**0.653**	0.361	0.359	0.182	0.578	0.211	-0.010	0.220	0.240
CR3	0.499	**0.837**	0.474	0.437	0.331	0.403	0.413	0.258	0.306	0.324
CR4	0.529	**0.686**	0.487	0.484	0.285	0.276	0.387	0.383	0.163	0.121
CR5	0.465	**0.652**	0.395	0.379	0.233	0.461	0.390	0.259	0.156	0.257
LIS1	0.575	0.617	**0.794**	0.534	0.340	0.135	0.281	0.165	0.186	0.211
LIS2	0.352	0.548	**0.768**	0.638	0.198	0.033	0.200	0.258	0.043	0.113
LIS3	0.486	0.526	**0.780**	0.573	0.018	0.079	0.151	0.124	0.147	0.091

Table 5.43
Cross Loadings of First Stage of Mediated Model

	SSP	CR	LIS	QIS	P/C	Q	DD	PI	TTM	OP
LIS4	0.470	0.429	**0.839**	0.643	0.168	0.117	0.172	0.290	0.174	0.142
LIS5	0.407	0.446	**0.753**	0.609	0.095	0.048	0.112	0.342	0.253	0.185
LIS6	0.415	0.413	**0.795**	0.720	0.183	0.099	0.179	0.309	0.161	0.272
QIS1	0.461	0.424	0.669	**0.864**	0.297	0.158	0.323	0.390	0.282	0.205
QIS2	0.391	0.466	0.698	**0.902**	0.142	0.073	0.215	0.466	0.178	0.161
QIS3	0.616	0.572	0.736	**0.918**	0.316	0.208	0.379	0.523	0.283	0.178
QIS4	0.460	0.589	0.671	**0.849**	0.254	0.210	0.186	0.393	0.198	0.290
QIS5	0.469	0.518	0.723	**0.908**	0.141	0.164	0.266	0.354	0.247	0.153
P/C1	0.491	0.421	0.222	0.189	**0.796**	0.488	0.520	0.399	0.384	0.272
P/C2	0.460	0.133	0.156	0.246	**0.824**	0.277	0.357	0.201	0.234	0.312
Q1	0.350	0.351	-0.011	0.061	0.183	**0.776**	0.383	0.159	0.281	0.162
Q2	0.373	0.503	0.070	0.114	0.419	**0.875**	0.603	0.135	0.350	0.328
Q3	0.497	0.384	0.098	0.122	0.484	**0.727**	0.542	0.222	0.455	0.359
Q4	0.445	0.523	0.184	0.283	0.347	**0.758**	0.612	0.390	0.380	0.230
DD1	0.232	0.377	0.186	0.274	0.416	0.637	**0.735**	0.348	0.187	0.188
DD2	0.398	0.364	0.201	0.283	0.496	0.546	**0.820**	0.511	0.389	0.204
DD3	0.305	0.333	0.151	0.156	0.299	0.381	**0.730**	0.466	0.504	0.133
PI1	0.204	0.195	0.311	0.476	0.237	0.117	0.343	**0.908**	0.409	0.306
PI2	0.225	0.234	0.226	0.255	0.411	0.300	0.536	**0.654**	0.223	0.087
PI3	0.373	0.304	0.260	0.415	0.334	0.351	0.622	**0.872**	0.457	0.236
TTM1	0.444	0.332	0.233	0.291	0.532	0.493	0.537	0.444	**0.679**	0.252
TTM2	0.190	0.143	0.004	-0.100	-0.036	0.314	0.261	0.212	**0.667**	0.321
TTM3	0.008	0.084	0.108	0.192	0.039	0.026	0.134	0.342	**0.631**	0.537

Table 5.43
Cross Loadings of First Stage of Mediated Model

	SSP	CR	LIS	QIS	P/C	Q	DD	PI	TTM	OP
TTM4	0.516	0.333	0.205	0.291	0.408	0.462	0.380	0.338	**0.877**	0.531
OP1	0.114	0.160	0.066	-0.086	0.390	0.179	0.154	0.022	0.236	**0.615**
OP2	0.307	0.310	0.297	0.293	0.312	0.305	0.229	0.358	0.475	**0.862**
OP3	0.120	0.121	0.022	0.064	0.263	0.107	-0.039	0.005	0.341	**0.783**
OP4	0.318	0.326	0.128	0.093	0.310	0.500	0.289	0.201	0.528	**0.833**
OP5	0.137	0.194	0.160	0.172	0.263	0.143	0.129	0.319	0.542	**0.868**
OP6	0.380	0.444	0.376	0.431	0.293	0.367	0.337	0.365	0.527	**0.780**
OP7	0.270	0.388	0.164	0.176	0.218	0.299	0.150	0.178	0.488	**0.782**

As can be seen in Table 5.43, items capturing different constructs load high on their own construct but lower on the other constructs. The analysis of cross-loadings, therefore, indicates that the discriminant validity of the measurement model is established.

The second approach that is used to assess discriminant validity is the Fornell-Larcker criterion. This criterion compares the square root of the average variance extracted (AVE) values with the variable correlations. Specifically, the square root of each variable's AVE should be greater than its highest correlation with any other variable. An alternative approach to evaluating the results of the Fornell-Larcker criterion is to determine whether the AVE is larger than the squared correlation with any other variable. The logic of the Fornell-Larcker method is based on the idea that a variable shares more variance with its associated items than with any other variable.

Table 5.44 shows the discriminant validity assessment of the mediated model using the Fornell-Larcker criterion.

As indicated in Table 5.44, the square root of each construct's AVE is on the diagonal. The non-diagonal entries represent the correlations between the constructs. It is obvious that the square root of each construct's AVE is larger than its correlation with other constructs. Thus, the discriminant validity is established.

Table 5.44
Fornell-Larcker Criterion of First Stage of Mediated Model

	SSP	CR	LIS	QIS	P/C	Q	DD	PI	TTM	OP
SSP	**0.713**									
CR	0.681	**0.712**								
LIS	0.574	0.626	**0.789**							
QIS	0.550	0.581	0.788	**0.889**						
P/C	0.586	0.336	0.232	0.269	**0.810**					
Q	0.533	0.566	0.112	0.187	0.468	**0.786**				
DD	0.412	0.470	0.237	0.317	0.538	0.690	**0.763**			
PI	0.324	0.290	0.325	0.485	0.366	0.289	0.579	**0.819**		
TTM	0.448	0.332	0.210	0.272	0.378	0.471	0.464	0.463	**0.720**	
OP	0.305	0.360	0.229	0.223	0.361	0.351	0.232	0.279	0.580	**0.793**

To conclude, the convergent and discriminant validities of the first stage of the mediated measurement model are both established. The first stage of the mediated measurement model is depicted in Figure 5.4. In this stage, the latent variable scores are extracted and added to the database to be used in the second stage. These scores are attached in Appendix B.

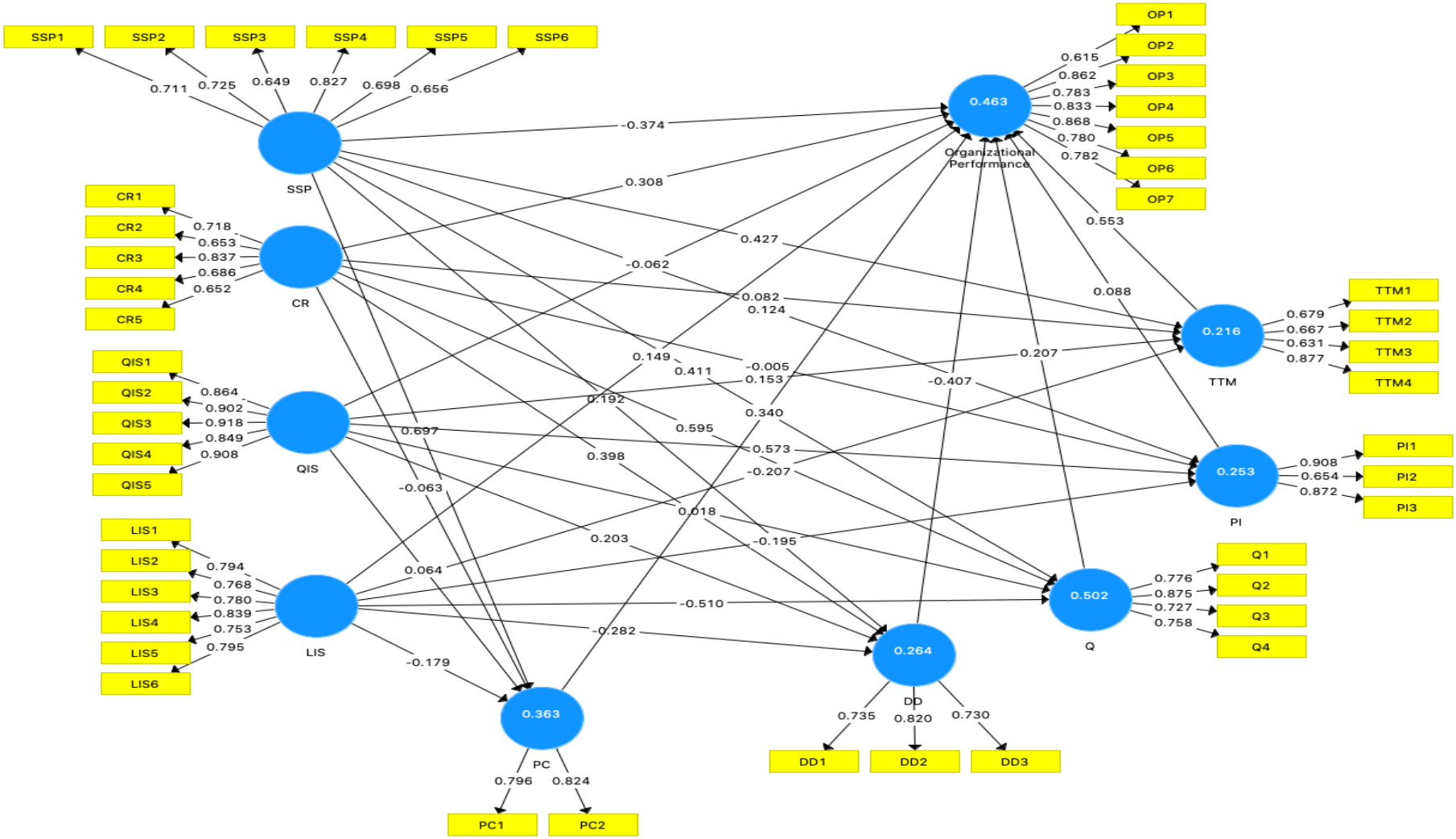

Figure 5.4: Results of First Stage of Mediated Measurement Model

5.5.2 Second Stage

In the second stage, the lower-order component (LOC) scores are used as manifest variables in the higher-order component (HOC) measurement model. The results of the second stage of the mediated measurement model are shown in Figure 5.5.

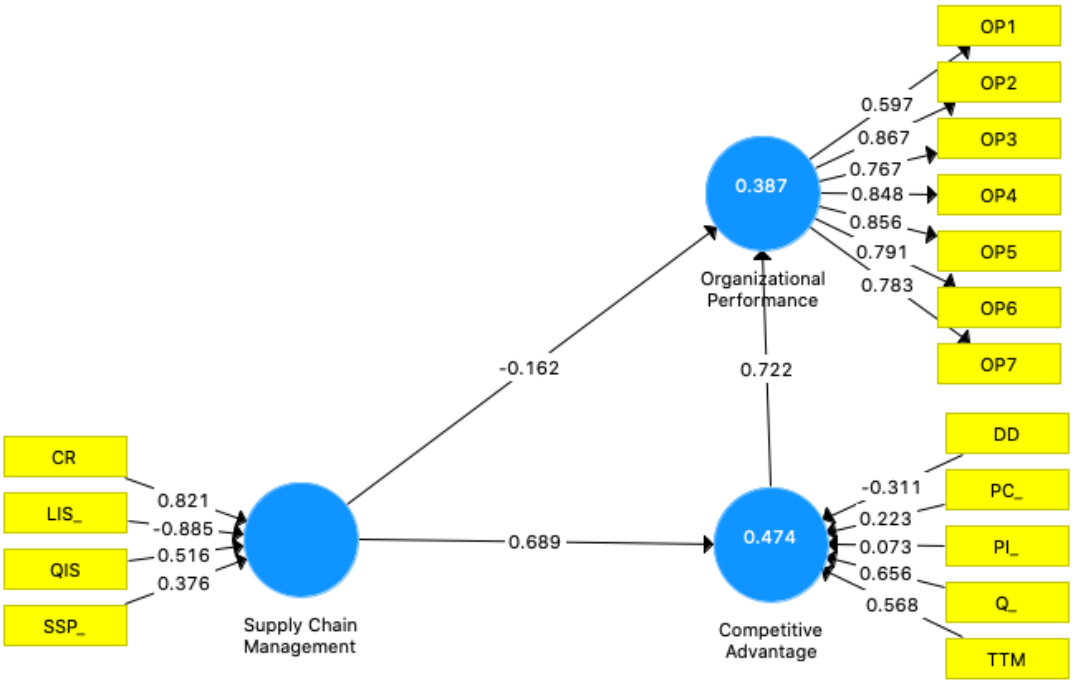

Figure 5.5: Results of Second Stage of Mediated Measurement Model

Convergent Validity

The convergent validity assessment of the second stage of the mediated measurement model is shown in Table 5.45.

As indicated in Table 5.45, all items that capture organizational performance are ensured to have factor loadings according to the previously-mentioned criteria before the structural equation model is estimated. In addition, Table 5.45 indicates that organizational performance has average variance extracted (AVE) of 0.627, which exceeds the minimum threshold of 0.50. Finally, organizational performance has composite reliability (CR) value of 0.921, which is well above the minimum acceptable level of 0.70.

Therefore, the convergent validity of the second stage of the measurement model is established according to the above three criteria.

Table 5.45
Convergent Validity of Second Stage of Mediated Model

Construct	Item	Loading	AVE	CR
Organizational Performance	OP1	0.597	0.627	0.921
	OP2	0.867		
	OP3	0.767		
	OP4	0.848		
	OP5	0.856		
	OP6	0.791		
	OP7	0.783		

Discriminant Validity

The discriminant validity assessment of the second stage of the mediated measurement model using cross loadings is shown in Table 5.46.

Table 5.46
Cross Loadings of Second Stage of Mediated Model

	Supply Chain Management	Competitive Advantage	Organizational Performance
SSP	**0.520**	0.409	0.069
CR	**0.817**	0.518	0.365
LIS	**0.125**	0.047	0.121
QIS	**0.474**	0.293	0.228
P/C	0.416	**0.598**	0.361
Q	0.700	**0.831**	0.364
DD	0.534	**0.599**	0.228
PI	0.328	**0.473**	0.286
TTM	0.492	**0.833**	0.602
OP1	0.138	0.289	**0.597**

Table 5.46
Cross Loadings of Second Stage of Mediated Model

	Supply Chain Management	Competitive Advantage	Organizational Performance
OP2	0.288	0.524	**0.867**
OP3	0.161	0.347	**0.767**
OP4	0.367	0.622	**0.848**
OP5	0.171	0.453	**0.856**
OP6	0.369	0.549	**0.791**
OP7	0.271	0.482	**0.783**

As can be seen in Table 5.46, dimensions capturing supply chain management load high on this variable but lower on the other two variables. Similarly, dimensions that tap competitive advantage load high on their own variable but lower on the other two variables. Finally, items that measure organizational performance load high on their own variable but lower on the other two variables

The analysis of cross-loadings, therefore, indicates that the discriminant validity of the second stage of the mediated measurement model is established.

Collinearity Assessment

Table 5.47 shows the collinearity assessment of the formative measures of the second stage of the mediated model using the variance inflation factor (VIF).

Table 5.45 indicates that dimensions that capture supply chain management have values of variance inflation factor (VIF) that are less than 5. Similarly, dimensions that tap competitive advantage have variance inflation factor (VIF) below 5. Therefore, it is concluded that there is no collinearity problem in the second stage of the mediated measurement model.

Table 5.47
Collinearity of Second Stage of Mediated Model

Item	VIF	Result
Supply chain management		
SSP	1.387	Acceptable
CR	1.714	Acceptable
LIS1	2.592	Acceptable
QIS1	2.621	Acceptable
Competitive advantage		
P/C	1.479	Acceptable
Q	2.157	Acceptable
DD	2.669	Acceptable
PI	1.598	Acceptable
TTM	1.603	Acceptable

Item Weights

Item weights are used to examine if a dimension contributes to forming a given reflective measure or not. Hence, the significance of the item weights in the second stage of measurement model is assessed as shown in Table 5.48.

Table 5.48 indicates that among the four dimensions of supply chain management, customer relationship is the only one that contributes to shaping supply chain management ($P < 0.05$). In contrast, strategic supplier relationship, level of information sharing, and quality of information sharing do not contribute to forming supply chain management since they have P-values of more than 0.05.

Similarly, among the five dimensions of competitive advantage, product quality and time to market are the two dimensions that contribute to forming competitive advantage at Starwood Industries ($P < 0.01$ and $P < 0.001$, respectively). In contrast, since the three other dimensions (i.e. price/cost, product innovation, and delivery dependability)

have P-values greater than 0.05, they do not play a role in forming competitive advantage.

Table 5.48
Item Weights of Second Stage of Mediated Model

	Original Sample	Sample Mean	Standard Deviation	T Statistic	P Value
			Supply chain management		
SSP -> SCM	0.376	0.302	0.262	1.432	0.152
CR ->SCM	0.821	0.654	0.348	2.358	0.018*
LIS -> SCM	-0.885	-0.661	0.645	1.372	0.170
QIS -> SCM	0.516	0.524	0.414	1.245	0.213
			Competitive advantage		
Q -> CA	0.656	0.564	0.230	2.858	0.004**
P/C -> CA	0.223	0.234	0.233	0.958	0.338
PI -> CA	0.073	0.151	0.247	0.295	0.768
DD -> CA	-0.311	-0.324	0.221	1.410	0.159
TTM -> CA	0.568	0.555	0.142	3.998	0.000***

*** Significant at P < 0.001, ** Significant at P < 0.01, * Significant at P < 0.05.

5.6 Testing Mediated Structural Model

Having assessed the mediated measurement model, it is time to test the first three hypotheses that were previously developed using the partial least squares structural equation modelling (PLS-SEM) technique.

Recall that the first three hypotheses to be tested are:

H_1: Supply chain management has a positive direct effect on the competitive advantage of Starwood Industries.

H_2: Supply chain management has a positive direct effect on the organizational performance of Starwood Industries.

H_3: Competitive advantage has a positive direct effect on the organizational performance of Starwood Industries.

To test each of the above hypotheses, the partial least squares structural equation model (PLS-SEM) is run by drawing 5,000 bootstrap samples. The results of the bootstrapping procedure are presented in Table 5.49.

Table 5.49
Path Analysis of Mediated Model

Hypothesis	Std. Beta	Std. Error	T-Value	P-Value
H_1: Supply chain management → Competitive advantage	0.689	0.200	3.439	0.001**
H_2: Supply chain management → Organizational performance	-0.162	0.226	0.717	0.474
H_3: Competitive advantage → Organizational performance	0.722	0.721	4.210	0.000***

*** Significant at P < 0.001, ** Significant at P < 0.01, * Significant at P < 0.05.

Table 5.49 indicates that the coefficient of the path between supply chain management and competitive advantage is 0.689. This coefficient is significant at the 0.01 level. In addition, the coefficient has a positive sign, meaning that supply chain management positively affects competitive advantage of Starwood industries. Thus, the hypothesis that supply chain management has a positive effect on the competitive advantage of Starwood Industries is accepted.

This result is consistent with the results of Quynh and Huy (2018), Singh et al. (2017), and Li et al. (2006) who also found that supply chain management has a significant positive effect on competitive advantage.

Similarly, the coefficient of the path between supply chain management and organizational performance is -0.162. However, this coefficient is not significant at the 0.05 level. This means that supply chain management has no direct effect on the organizational performance of Starwood Industries. Thus, the hypothesis that supply chain management has a direct positive effect on the organizational performance of Starwood Industries is rejected.

This result is consistent with the result of Singh et al. (2017) who also concluded that supply chain management has no significant effect on organizational performance. However, this result does not agree with many previous empirical studies that found a significant positive effect of supply chain management on organizational performance (e.g. Baah and Jin, 2019; Benedict, 2017; Khang et al., 2010; Li et al., 2006; Mensah et al., 2014; Nyangweso, 2013; Quynh and Huy, 2018; Soderberg and Bengtsson, 2010; and Wijetunge, 2017).

Finally, the coefficient of the path between competitive advantage and organizational performance is 0.722. This coefficient is significant at the 0.01 level. Moreover, the coefficient has a positive sign, indicating that competitive advantage positively affects the organizational performance of Starwood industries. Therefore, the hypothesis that competitive advantage has a positive effect on the organizational performance of Starwood Industries is accepted.

This result agrees with the results of Baah and Jin (2019), Quynh and Huy (2018), Chen et al. (2006), and Li et al. (2006) who all found that competitive advantage has a significant positive effect on organizational performance. In contrast, this result does not agree with that of Singh et al. (2017) who concluded the opposite.

In order to investigate if there is indirect effect of supply chain management, through competitive advantage, on the organizational performance of Starwood Industries, the indirect effect is analyzed as shown in Table 5.50.

Table 5.50
Indirect Effect of Supply Chain Management

Hypothesis	Std. Beta	Std. Error	T-Value	P-Value
Supply chain management → Organizational performance	0.497	0.205	2.429	0.015*

*** Significant at P < 0.001, ** Significant at P < 0.01, * Significant at P < 0.05.

As indicated in Table 5.50, supply chain management has an indirect positive effect on the organizational performance of Starwood Industries ($\beta = 0.497, P < 0.05$) through competitive advantage.

This result is the same as the result of Karimi and Rafiee (2015) who confirmed that supply chain management, through competitive advantage, has a significant positive effect on organizational performance.

Figure 5.6 summaries the results of the bootstrapping procedure.

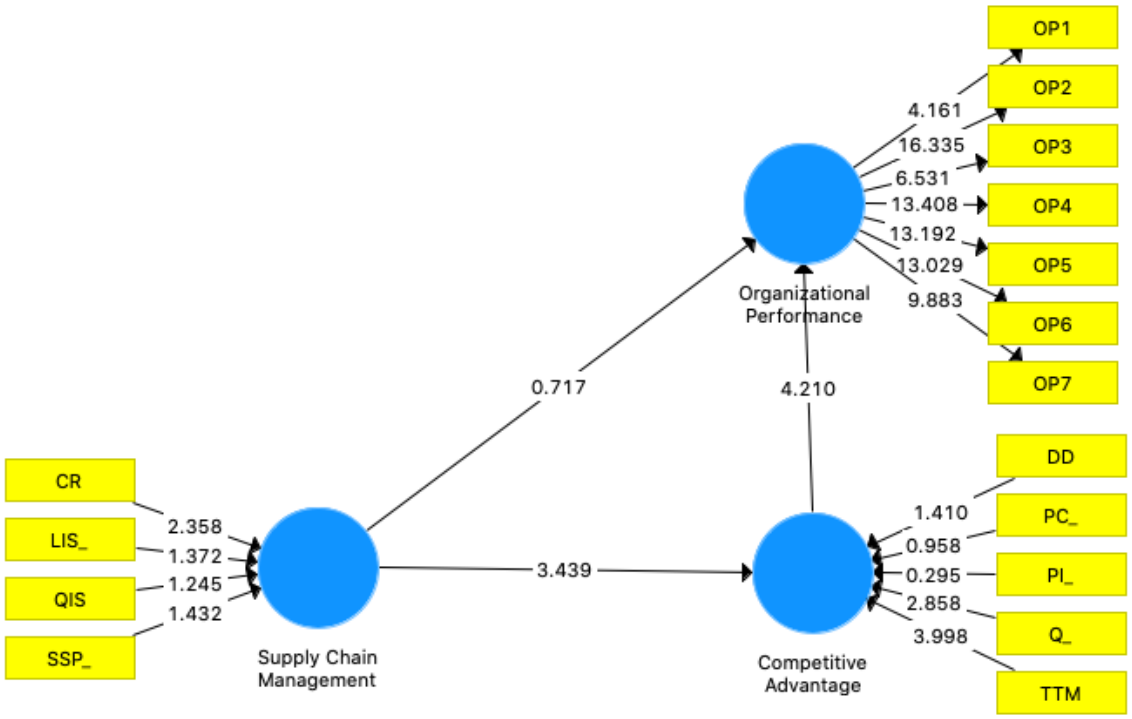

Figure 5.6: Results of Bootstrapping Procedure – Mediated Model

5.7 Assessment of Mediated Structural Model

Having estimated the partial least squares structural equation model (PLS-SEM), it is necessary now to assess the PLS-SEM that is already estimated. Typically, three main criteria are used in this context: (1) coefficient of determination (R^2), (2) effect size (f^2), and (3) predictive relevance (Q^2). Each of these criteria is discussed in the following pages.

The coefficient of determination (R^2) is an important criterion in the assessment of the partial least squares structural equation model (PLS-SEM). This coefficient represents the proportion of the variation in the dependent variable that can be explained by one or more predictor variable (Hair et al., 2010).

Although the acceptable level of the coefficient of determination (R^2) value depends on the research context (Hair et al., 2010), Falk and Miller (1992) propose an R^2 value of 0.10 as a minimum acceptable level. According to Cohen (1988), R^2 values of

dependent variables are assessed as follows: (1) substantial (0.26), (2) moderate (0.13), and (3) weak (0.02).

The coefficient of determination (R^2) for the dependent variables of the mediated model is shown in Table 5.51.

Table 5.51
Coefficient of Determination (R^2) of Mediated Model

Dependent Variable	R^2	Result
Competitive advantage	0.474	Substantial
Organizational performance	0.387	Substantial

As Table 5.51 indicates that competitive advantage has an R^2 value of 0.474. This means that approximately 47% of the variation in competitive advantage is explained by the independent variable (i.e. supply chain management). This R^2 value is considered more than the minimum acceptable level according to Falk and Miller (1992) and substantial according to Cohen (1988).

Similarly, organizational performance has an R^2 value of 0.387. This means that nearly 39% of the variation in organizational performance is explained by the two independent variables (i.e. supply chain management and competitive advantage). This R^2 value is also considered more than the minimum acceptable level according to Falk and Miller (1992), moderate according to Chin (1998), and substantial according to Cohen (1988).

Another criterion used in the assessment of the partial least squares structural equation model (PLS-SEM) is the effect size (f^2). It indicates the relative effect of a particular independent variable on the dependent variable due to changes in the R^2 (Chin, 1998). The effect size (f^2) is calculated as the increase in R^2 of the dependent variable to which the path is connected relative to the dependent variable's proportion of unexplained variance (Chin, 1998).

According to Cohen (1988), an effect size (f^2) above 0.35 is considered large, an effect size (f^2) ranging from 0.15 to 0.35 is considered medium, an effect size (f^2) between 0.02 to 0.15 is considered small, and an effect size (f^2) less than 0.02 is considered with no effect.

The effect size (f^2) for the dependent variables of the mediated model is shown in Table 5.52.

Table 5.52
Effect Size (f^2) of Mediated Model

Path	f^2	Result
Supply chain management → Competitive advantage	0.902	Large
Supply chain management → Organizational performance	0.022	Small
Competitive advantage → Organizational performance	0.447	Large

Table 5.52 indicates that supply chain management has a large effect size of 0.902 on competitive advantage. Moreover, supply chain management has a small effect size on organizational performance (f^2 = 0.022). Finally, competitive advantage has a large effect size of 0.447 on organizational performance.

In addition to testing the coefficient of determination (R^2) and the effect size (f^2), it is also necessary to test the predictive capability of the estimated PLS-SEM. This is carried out using the predictive relevance (Q^2) test.

The predictive relevance (Q^2) can be calculated using the cross-validated redundancy approach or the cross-validated communality approach. In this study, the cross-validated redundancy approach is used as a measure of predictive relevance (Q^2) since it, as opposed to the other approach, includes the structural model, the key element of the path model, to predict eliminated data points.

According to Fornell and Cha (1994), a cross-validated redundancy value of more than zero shows that there is predictive relevance while a value of less than zero indicates that the model lacks predictive relevance.

The predictive relevance (Q^2) of the mediated model using the cross-validated redundancy approach is shown in Table 5.53.

Table 5.53
Predictive Relevance (Q^2) of Mediated Model

Dependent Variable	SSO	SSE	Q^2 (1-SSE/SSO)
Competitive advantage	255.000	208.613	0.182
Organizational performance	357.000	281.303	0.212

In Table 5.53, SSO is the sum of the squared observations, SSE is the sum of the squared prediction errors, and the last column (i.e., 1–SSE/SSO) is the Q^2 value, which is used to assess the model's predictive relevance with regard to each dependent variable.

Table 5.53 indicates that the Q^2 values of the two dependent variables are above zero. More specifically, competitive advantage has Q^2 value of 0.182 whereas organizational performance has Q^2 value of 0.212. These values provide support for the model's predictive relevance regarding the dependent variables.

5.8 Assessment of Non-Mediated Measurement Model

Before testing the mediation effect of competitive advantage, it is necessary first to assess the measurement model that will be used to test this hypothesis. In other words, the measurement model with no mediator variable (i.e. with no competitive advantage).

5.8.1 First Stage

Again, in the first stage, the repeated indicators approach is used to obtain the latent variable scores for the lower-order components (LOCs). Then, these scores are used in the second stage. Convergent validity and discriminant validity are discussed below. More specifically, since the two measures used in the first stage are formative, it is appropriate to assess factor loadings, composite reliability (CR), average variance extracted (AVE), cross loadings, and Fornell-Larcker criterion**.**

Convergent Validity

Table 5.54 shows convergent validity assessment of the first stage of the non-mediated measurement model.

As indicated in Table 5.54, all items that capture supply chain management and organizational performance are ensured to have factor loadings according to the previously-mentioned criteria before the non-mediated structural equation model is estimated. Furthermore, Table 5.54 indicates that each of the different constructs has average variance extracted (AVE) exceeding the minimum threshold of 0.50. Finally, each of the different constructs has composite reliability (CR) higher than the minimum acceptable level of 0.70.

Therefore, it is concluded that the convergent validity of the first stage of the non-mediated measurement model is established according to the above three criteria.

Table 5.54
Convergent Validity of First Stage of Non-Mediated Model

Construct	Item	Loading	AVE	CR
Supply chain management				
Strategic supplier partnership			0.507	0.836
	SSP1	0.673		
	SSP3	0.610		
	SSP4	0.723		
	SSP5	0.806		
	SSP6	0.732		
Customer relationship			0.504	0.834
	CR1	0.783		
	CR2	0.669		
	CR3	0.835		
	CR4	0.610		
	CR5	0.626		
Level of information sharing			0.636	0.897
	LIS1	0.778		
	LIS3	0.764		
	LIS4	0.829		
	LIS5	0.772		
	LIS6	0.841		
Quality of information sharing			0.788	0.949
	QIS1	0.849		

Table 5.54
Convergent Validity of First Stage of Non-Mediated Model

Construct	Item	Loading	AVE	CR
	QIS2	0.907		
	QIS3	0.902		
	QIS4	0.880		
	QIS5	0.898		
Organizational performance			0.621	0.919
	OP1	0.569		
	OP2	0.861		
	OP3	0.742		
	OP4	0.847		
	OP5	0.834		
	OP6	0.817		
	OP7	0.808		

Discriminant Validity

Table 5.55 shows discriminant validity assessment of the first stage of the non-mediated measurement model using cross loadings.

As can be seen in Table 5.55, items capturing different constructs load high on their own construct but lower on the other constructs. The analysis of cross-loadings, therefore, indicates that the discriminant validity of the first stage of the non-mediated measurement model is established.

Table 5.55
Discriminant Validity of First Stage of Non-Mediated Model

	SSP	CR	LIS	QIS	OP
SSP1	**0.673**	0.532	0.367	0.342	0.212
SSP3	**0.610**	0.416	0.331	0.303	0.182
SSP4	**0.723**	0.568	0.462	0.410	0.157
SSP5	**0.806**	0.351	0.402	0.374	0.452
SSP6	**0.732**	0.404	0.542	0.520	0.287
CR1	0.355	**0.783**	0.522	0.421	0.353
CR2	0.457	**0.669**	0.348	0.386	0.261
CR3	0.444	**0.835**	0.429	0.444	0.355
CR4	0.483	**0.610**	0.475	0.474	0.141
CR5	0.437	**0.626**	0.396	0.374	0.271
LIS1	0.536	0.631	**0.778**	0.529	0.240
LIS3	0.452	0.513	**0.764**	0.560	0.104
LIS4	0.486	0.412	**0.829**	0.639	0.169
LIS5	0.415	0.432	**0.772**	0.602	0.187
LIS6	0.434	0.414	**0.841**	0.728	0.276
QIS1	0.511	0.403	0.677	**0.849**	0.225
QIS2	0.405	0.461	0.701	**0.907**	0.179
QIS3	0.610	0.540	0.719	**0.902**	0.206
QIS4	0.430	0.589	0.651	**0.880**	0.310
QIS5	0.456	0.509	0.705	**0.898**	0.185
OP1	0.169	0.159	0.078	-0.086	**0.569**
OP2	0.365	0.314	0.321	0.294	**0.861**
OP3	0.217	0.145	0.042	0.080	**0.742**

Table 5.55
Discriminant Validity of First Stage of Non-Mediated Model

	SSP	CR	LIS	QIS	OP
OP4	0.351	0.344	0.158	0.111	**0.847**
OP5	0.236	0.215	0.186	0.186	**0.834**
OP6	0.430	0.449	0.370	0.438	**0.817**
OP7	0.359	0.424	0.162	0.185	**0.808**

Table 5.56 shows discriminant validity assessment of the first stage of the non-mediated measurement model using the Fornell-Larcker criterion.

Table 5.56
Fornell-Larcker Criterion of First Stage of Non-Mediated Model

	SSP	CR	LIS	QIS	OP
SSP	**0.712**				
CR	0.000	**0.710**			
LIS	0.000	0.600	**0.797**		
QIS	0.000	0.574	0.775	**0.888**	
OP	0.000	0.411	0.266	0.000	**0.788**

As indicated in Table 5.56, the square root of each construct's AVE is on the diagonal. The non-diagonal entries represent the correlations between the constructs. It is clear that the square root of each construct's AVE is larger than its correlation with other constructs. Therefore, it is concluded that discriminant validity of the first stage of the non-mediated measurement model is established.

To summarize, the convergent validity and discriminant validity of the first stage of the non-mediated measurement model are established. The results of the first stage of the non-mediated measurement model is depicted in Figure 5.7. In this stage, the latent variable scores are extracted and added to the database to be used in the second stage. These scores are attached in Appendix C.

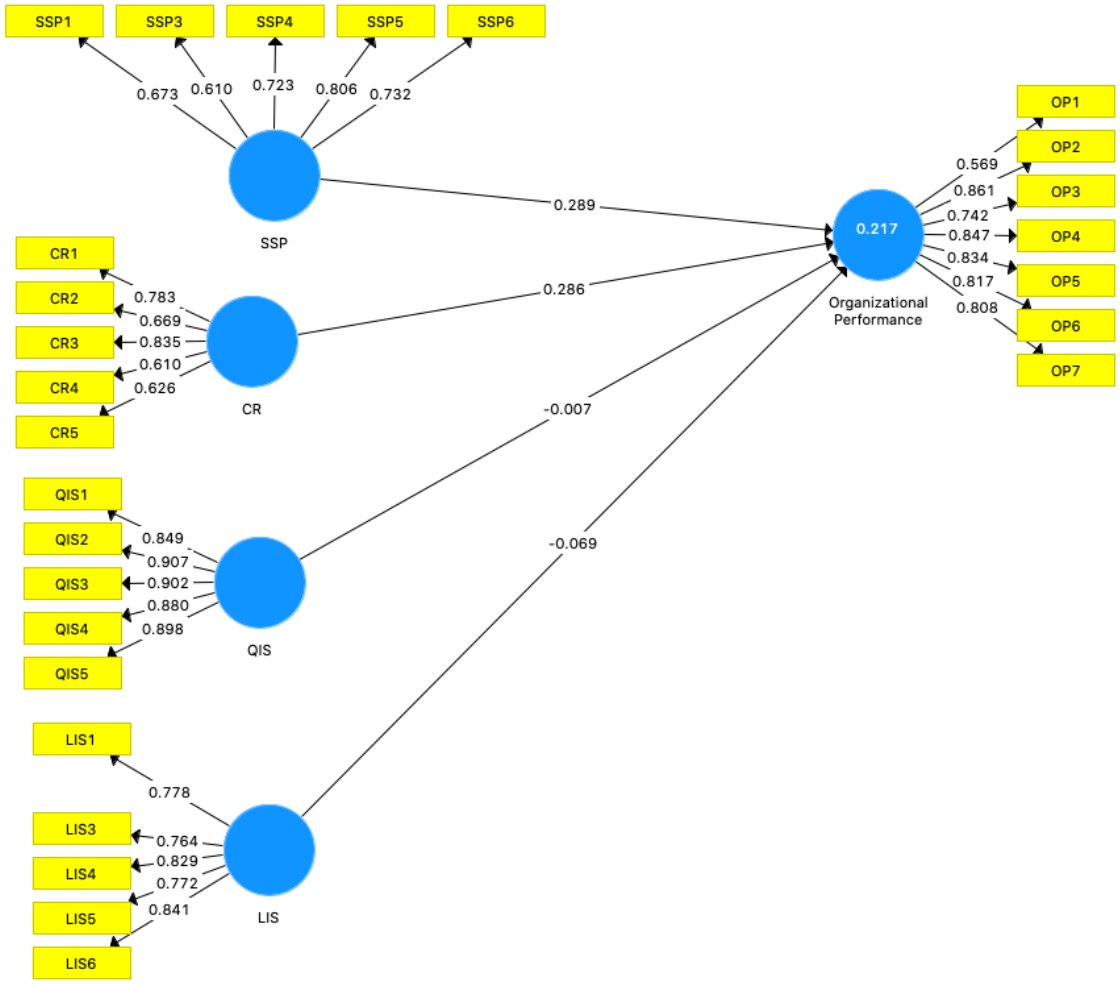

Figure 5.7: Results of First Stage of Non-Mediated Measurement Model

5.8.2 Second Stage

In this stage, the lower-order component (LOC) scores are used as manifest variables in the higher-order component (HOC) measurement model. The results of the second stage of the non-mediated measurement model are shown in Figure 5.8.

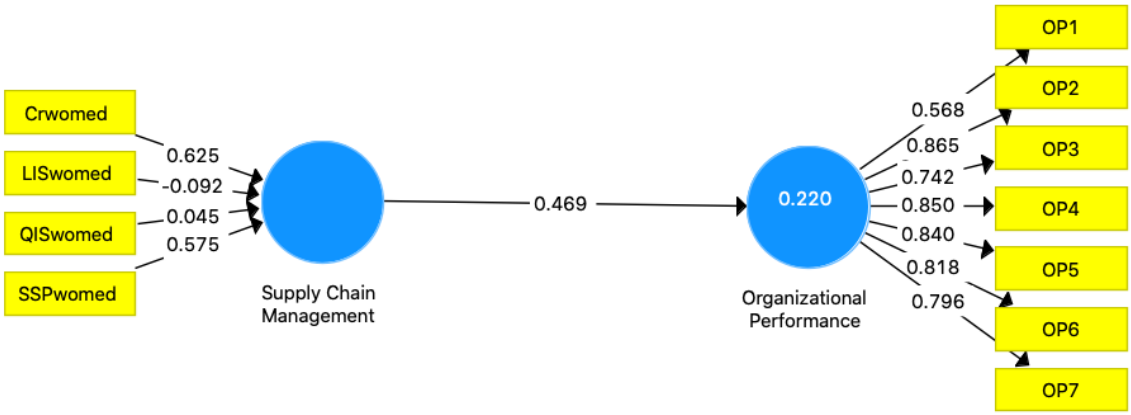

Figure 5.8: Results of Second Stage of Non-Mediated Measurement Model

Convergent Validity

Table 5.57 shows the convergent validity assessment of the second stage of the non-mediated measurement model.

Table 5.57
Convergent Validity of Second Stage of Non-Mediated Model

Construct	Item	Loading	AVE	CR
Organizational performance	OP1	0.568	0.622	0.919
	OP2	0.865		
	OP3	0.742		
	OP4	0.850		
	OP5	0.840		
	OP6	0.818		
	OP7	0.796		

As indicated in Table 5.57, all items that capture organizational performance are ensured to have factor loadings according to the previously-mentioned criteria before the structural equation model is estimated. In addition, Table 5.55 indicates that organizational performance has average variance extracted (AVE) of 0.622, which exceeds the minimum threshold of 0.50. Finally, organizational performance has composite reliability (CR) value of 0.919, which is well above the minimum acceptable level of 0.70.

Therefore, the convergent validity of the second stage of the non-mediated measurement model is established according to the above three criteria.

Collinearity Assessment

Table 5.58 shows the collinearity assessment of the formative measure in the second stage of the non-mediated model (i.e. items of supply chain management) using the variance inflation factor (VIF).

Table 5.58
Collinearity of Second Stage of Non-Mediated Model

Item	VIF	Result
Supply chain management		
SSP	1.613	Acceptable
CR	1.382	Acceptable
LIS	2.916	Acceptable
QIS	2.772	Acceptable

Table 5.58 indicates that items that measure supply chain management have values of variance inflation factor (VIF) that are less than 5. Therefore, it is concluded that there is no collinearity problem in the second stage of the non-mediated measurement model.

Item Weights

The item weights of the second stage of the non-mediated measurement model are assessed as shown in Table 5.59.

Table 5.59
Item Weights of Second Stage of Non-Mediated Model

	Original Sample	Sample Mean	Standard Deviation	T Statistic	P Value
Supply chain management					
SSP -> SCM	0.575	0.538	0.335	1.717	0.086
CR ->SCM	0.625	0.466	0.294	2.124	0.034*
LIS -> SCM	-0.092	0.010	0.610	0.151	0.880
QIS -> SCM	0.045	-0.012	0.666	0.067	0.946

*** Significant at P < 0.001, ** Significant at P < 0.01, * Significant at P < 0.05.

Table 5.59 indicates that among the four dimensions of supply chain management, customer relationship is the only dimension that contributes to shaping supply chain management ($P < 0.05$). In contrast, strategic supplier relationship, level of information

sharing, and quality of information sharing do not contribute to forming supply chain management since they have P-values of more than 0.05.

5.9 Testing Mediation Effect

Previously, it was concluded that supply chain management has no direct effect on the organizational performance of Starwood Industries, but indirectly affects it through competitive advantage. This suggests that competitive advantage may be a mediator variable. In this section, the potential mediation effect of competitive advantage is empirically tested.

Recall that the fourth hypothesis to be tested is:

H_4: Competitive advantage mediates the relationship between supply chain management and organizational performance at Starwood Industries.

But before proceeding with testing the mediation effect of competitive advantage, it is important to say that a mediation effect is generated when a third variable intervenes between two other related variables. To understand how the mediation effect works, it is necessary to go back to the previous path model (i.e. Figure 5.2) in terms of direct and indirect effects. The direct effect is the relationship connecting two variables with one arrow whereas the indirect effect is a sequence of relationships with at least one intervening variable. Therefore, an indirect effect is a sequence of two or more direct effects that are represented by multiple arrows. This indirect effect is the mediation effect. In this study, competitive advantage is modeled as a mediator between supply chain management and organizational performance.

In order to test the previous hypothesis, the PLS-SME is run again, by drawing 5,000 bootstrap samples, without the mediator variable (i.e. competitive advantage). The results of the bootstrapping procedure are shown in Figure 5.3. In addition, these results are shown in Figure 5.60.

Table 5.60 indicates that the coefficient of the path between supply chain management and organizational performance is 0.469. This coefficient is significant at the 0.001 level. In addition, the coefficient has a positive sign, meaning that supply chain management positively affects organizational performance of Starwood Industries.

Table 5.60
Path Analysis of Non-Mediated Model

Hypothesis	Std. Beta	Std. Error	T-Value	P-Value
H_4: Supply chain management → Organizational performance	0.469	0.137	3.413	0.001***

*** Significant at P < 0.001, ** Significant at P < 0.01, * Significant at P < 0.05.

Since supply chain management has a positive direct effect on the organizational performance of Starwood Industries when competitive advantage (i.e. mediator variable) is removed from the PLS-SEM model, but the relationship is not significant when competitive advantage is included in the model, it is concluded that competitive advantage fully mediates the relationship between supply chain management and organizational performance.

More specifically, respondents perceive Starwood Industries to have excellent supply chain management, which in turn enhances its competitive advantage, and ultimately improve the organizational performance of the company. In this case, the relationship between supply chain management and organizational performance is explained by the supply chain management → competitive advantage → organizational performance sequence. In summary, the full mediation effect of competitive advantage explains how supply chain management is related to the organizational performance at Starwood Industries.

The above result is in agreement with the results of Baah and Jin (2019), Wijetunge (2017), and Karimi and Rafiee (2015) who also concluded that competitive advantage mediates the relationship between supply chain management and organizational performance.

The results of the bootstrapping procedure of the non-mediated model are summarized in Figure 5.9.

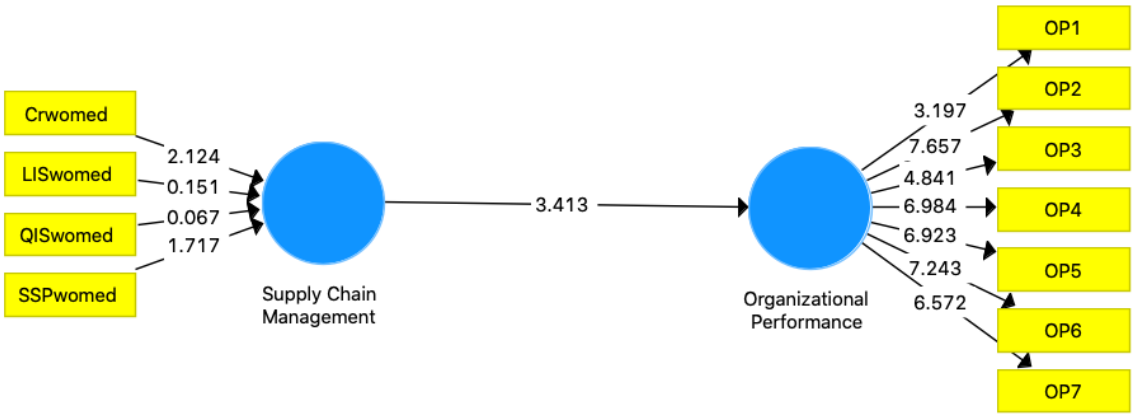

Figure 5.9: Results of Bootstrapping Procedure – Non-Mediated Model

5.10 Assessment of Non-Mediated Structural Model

Having estimated the non-mediated partial least squares structural equation model (PLS-SEM), it is necessary now to assess the structural model that is already estimated. Again, three main criteria are used: (1) coefficient of determination (R^2), (2) effect size (f^2), and (3) predictive relevance (Q^2). Each of these criteria is discussed in the following pages.

The coefficient of determination (R^2) for the dependent variable of the non-mediated model is shown in Table 5.61.

Table 5.61
Coefficient of Determination (R^2) of Non-Mediated Model

Dependent Variable	R^2	Result
Organizational performance	0.220	Moderate

As Table 5.61 indicates that organizational performance has an R^2 value of 0.220. This means that 22% of the variation in organizational performance is explained by supply chain management (i.e. the independent variable). This R^2 value is considered more than the minimum acceptable level according to Falk and Miller (1992) and moderate according to Cohen (1988).

The effect size (f^2) for the dependent variable of the non-mediated model is shown in Table 5.62.

Table 5.62 indicates that supply chain management has a moderate effect size of 0.282 on organizational.

Table 5.62
Effect Size (f^2) of Non-Mediated Model

Path	f^2	Result
Supply chain management → Organizational performance	0.282	Moderate

The predictive relevance (Q^2) of the non-mediated model using the cross-validated redundancy approach is shown in Table 5.63.

Table 5.63
Predictive Relevance (Q^2) of Non-Mediated Model

Dependent Variable	SSO	SSE	Q^2 (1-SSE/SSO)
Organizational performance	357.000	323.240	0.095

Table 5.63 indicates that the Q^2 value of the dependent variable (i.e. organizational performance) is more than zero. Therefore, the Q^2 value provides support for the model's predictive relevance regarding the dependent variable.

To summarize, the first hypothesis is accepted, the second hypothesis is rejected, the third hypothesis is accepted, and finally the fourth hypothesis is accepted.

Table 5.64 summarizes the results of hypotheses testing.

Table 5.64
Summary of Hypotheses Testing

Hypothesis	Path	Decision
H_1	SCM → CA	Accepted
H_2	SCM → OP	Rejected
H_3	CA → OP	Accepted
H_4	SCM → CA → OP	Accepted

CHAPTER SIX
CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

On the basis of data analysis and discussion, the main conclusions of the study are drawn below:

1. Starwood Industries has an excellent overall level of supply chain management with a score of 4.19 out of a maximum of 5. In detail, customer relationship and quality of information sharing are the most two implemented dimensions while strategic supplier partnership and level of information sharing are the least two implemented dimensions.

2. Starwood Industries has an excellent position of competitive advantage with a score of 4.36 out of a maximum of 5. More specifically, price/cost, product quality, and delivery dependability are the most important competitive advantage dimensions of Starwood Industries while product innovation and time to market are less important in this context.

3. Starwood Industries has an excellent level of organizational performance with a score of 4.00 out of a maximum of 5.

4. There is no significant variance in respondents' perceptions of the level of supply chain management at Starwood industries due to their characteristics except for job title where division heads have higher perceptions than employees.

5. There is no significant variance in respondents' perceptions of the level of competitive advantage at Starwood industries due to their characteristics.

6. There is no significant variance in respondents' perceptions of the level of organizational performance at Starwood industries due to their characteristics.

7. Among the four dimensions of supply chain management, customer relationship is the only one that contributes to shaping supply chain management at Starwood Industries. In contrast, strategic supplier relationship, level of information sharing, and quality of information sharing do not contribute to forming supply chain management.

8. Among the five dimensions of competitive advantage, product quality and time to market are the two dimensions that contribute to forming competitive advantage at Starwood Industries. In contrast, since the three other dimensions (i.e. price/cost, product innovation, and delivery dependability) have P-values greater 0.05, they do not play a role in forming competitive advantage.

9. Supply chain management of Starwood Industries has a direct positive effect on the level of competitive advantage of the company. In other words, improving supply chain management of Starwood Industries enhances the competitive advantage of the company.

10. Supply chain management of Starwood Industries has no direct positive effect on the organizational performance of the company.

11. Competitive advantage at Starwood Industries has a direct positive effect on the organizational performance of the company. To say it differently, strengthening the competitive advantage of Starwood Industries leads to better organizational performance of the company.

12. Supply chain management has an indirect positive effect on the organizational performance of the company via competitive advantage, which fully mediates the relationship between these two variables.

6.2 Recommendations

In light of the conclusions of this study, the following recommendations are worth mentioning:

1. Starwood Industries is recommended to effectively measure the level of its supply chain management because it can not be improved unless it is measured.

2. Due to increasing competition among supply chains, Starwood Industries is recommended to improve the level of effectiveness within its supply chain. More specifically, the company should pay more attention to the dimensions of strategic supplier partnership and level of information sharing.

3. Starwood Industries is recommended to view supply chain management as a strategic tool instead of just an operational activity.

4. Starwood Industries is advised to deal with suppliers as being an integral part of the company through building long-term relationships with them to enhance its competitive advantage, which in turn improves organizational performance.

5. Starwood Industries is recommended to identify different types of risks with respect to each process of the supply chain. Then, the company needs to mitigate these risks by using appropriate mitigation strategies.

6. Starwood Industries is advised to recruit professional personnel with extensive experience in managing every stage of supply chain.

7. Starwood Industries is recommended to keep in touch with its main customers to be able to get their feedback on a continuous basis so that it meets and exceeds their expectations.

8. Starwood Industries is advised to improve its IT infrastructure to enhance the level and quality of information sharing with supply chain partners.

9. Starwood Industries is recommended to effectively measure the level of its competitive advantage because it can not be enhanced unless it is measured

10. Due to increasing competition in the market where Starwood Industries operates, the company is recommended to enhance its competitive advantage relative to its competitors. More specifically, the company should pay more attention to the two dimensions of product innovation and time to market.

11. Starwood Industries is advised to take all the necessary measures to improve delivery dependability.

12. Starwood Industries is recommended to create a separate unit that is responsible for tasks related to product innovation. In addition, bonus packages should be granted to employees who have innovative product ideas.

13. Starwood Industries is recommended to effectively measure the level of its organizational performance, both market and financial, because it can not be improved unless it is measured.

6.3 Limitations of Study

The following limitations of study are worth mentioning:

1. The study is carried out during the academic year 2019/2020. Conducting the same study at a different period of time may yield different results.

2. The results of the study depend on the perceptions of a random sample of employees at Starwood Industries. Therefore, special attention should be paid to generalizability of results.

3. The level of supply chain management at Starwood Industries is measured using four dimensions. Namely, strategic supplier relationship, customer relationships, level of information sharing, and quality of information sharing. However, measuring supply chain management using other dimensions may yield different results.

4. The level of organizational performance of Starwood Industries is measured using two dimensions. Namely, market performance and financial performance. However, measuring organizational performance using other dimensions may yield different results.

6.4 Direction for Future Research

First, researchers are encouraged to carry out similar empirical studies on different manufacturing segments other than the wooden products. In addition, researchers are advised to conduct studies using larger sample sizes. Furthermore, researchers are directed to investigate the different relationships between supply chain management, competitive advantage, and organizational performance using scales other than those used in this study. Also, researchers are motivated to use statistical techniques other than those used in the current study. Finally, other studies may investigate the impact of supply chain management on other variables such as survival in the long-run.

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APPENDIX A

QUESTIONNAIRE

Dear Participant,

The researcher, who is currently continuing his higher education to get the Master's degree at the UPV University, is conducting a study titled "**The Impact of Supply Chain Management on Competitive Advantage and Organizational Performance of Starwood Industries**".

This questionnaire is designed to collect the necessary data for the study. The information you provide will help the researcher better understand the relationships between supply chain management, competitive advantage, and organizational performance at Starwood Industries. Because you are the one who can give a correct picture in this regard, I request you to respond to the questions frankly and honestly. Answering the questionnaire does not require more 10 minutes.

Your response will be kept strictly confidential. Only the researcher will have access to the information you provide.

Thank you very much for your time and cooperation. I greatly appreciate your help in furthering this research endeavor.

Cordially,

Murad Adeeleh

Section One: Respondents' Characteristics

Please circle the number of the appropriate response for you in respect of the following:

1. What is your gender?

1. Male
2. Female

2. What is your age?

1. Under 25
2. 25–35
3. 36–45
4. 46–55
5. Over 55

3. What is your highest completed level of education?

1. Below diploma
2. Diploma
3. BA
4. Master's
5. PhD

4. How many years of experience do you have at Starwood Industries?

1. 1–5
2. 6–10
3. 11–15
4. 16–20
5. More than 20

5. What is your job title?

1. Employee
2. Division head
3. Unit manager
4. Vice president
5. CEO / President
6. Other. Specify: _____

6. In your current position, what function best describes your responsibilities?

1. Finance / admin
2. Production management
3. Distribution
4. Purchasing
5. Sales
6. Product development
7. IT
8. Other. Specify:_____

Section Two: Supply Chain Management

Please decide the degree to which you agree or disagree with each of the following:

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Dimension 1: Strategic supplier partnership					
1. Starwood Industries considers quality as its number one criterion in selecting suppliers.					
2. Starwood Industries regularly solves problems jointly with its suppliers.					
3. Starwood Industries has helped its suppliers to improve their product quality.					
4. Starwood Industries has continuous improvement programs that include its key suppliers.					
5. Starwood Industries includes its key suppliers in its planning and goal-setting activities.					
6. Starwood Industries actively involves its key suppliers in new product development processes.					
Dimension 2: Customer relationship					
7. Starwood Industries frequently interacts with customers to set standards such as reliability and responsiveness.					
8. Starwood Industries frequently measures and evaluates its customer satisfaction.					
9. Starwood Industries frequently determines its future customer expectations.					
10. Starwood Industries facilitates customers' ability to seek assistance from it.					
11. Starwood Industries periodically evaluates the importance of its relationship with its customers.					

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Dimension 3: Level of information sharing					
12. Starwood Industries informs trading partners in advance of changing needs.					
13. Trading partners of Starwood Industries share proprietary information with the company.					
14. Trading partners of Starwood Industries keep the company fully informed about issues that affect its business.					
15. Trading partners of Starwood Industries share business knowledge of core business processes with the company.					
16. Starwood Industries and its trading partners exchange information that helps establishment of business planning.					
17. Starwood Industries and its trading partners keep each other informed about events or changes that may affect the other partners.					
Dimension 4: Quality of information sharing					
18. Information exchange between Starwood Industries and its trading partners is timely.					
19. Information exchange between Starwood Industries and its trading partners is accurate.					
20. Information exchange between Starwood Industries and its trading partners is complete.					
21. Information exchange between Starwood Industries and its trading partners is adequate.					
22. Information exchange between Starwood Industries and its trading partners is reliable.					

Section Three: Competitive Advantage

Please decide the degree to which you agree or disagree with each of the following:

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Dimension 1: Price/cost					
1. Starwood Industries offers competitive prices.					
2. Starwood Industries is able to offer prices as low or lower than its competitors.					
Dimension 2: Product quality					
3. Starwood Industries is able to compete based on quality.					
4. Starwood Industries offers products that are highly reliable.					
5. Starwood Industries offers products that are very durable.					
6. Starwood Industries offers high quality products to its customers.					
Dimension 3: Delivery dependability					
7. Starwood Industries delivers the kind of products needed.					
8. Starwood Industries delivers customer order on time.					
9. Starwood Industries provides dependable delivery.					
Dimension 4: Product innovation					
10. Starwood Industries provides customized products.					

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
11. Starwood Industries alters its product offerings to meet customer needs.					
12. Starwood Industries responds well to customer demand for “new” features.					
Dimension 5: Time to market					
13. Starwood Industries delivers product to market quickly.					
14. Starwood Industries is first in the market in introducing new products.					
15. Starwood Industries has time-to-market lower than industry average.					
16. Starwood Industries has fast product development.					

Section Four: Organizational Performance

Please decide the degree to which you agree or disagree with each of the following:

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Starwood Industries enhanced its market share over the last three years.					
2. Starwood Industries enhanced its return on investment over the last three years.					
3. Starwood Industries increased the growth of its market share over the last three years.					
4. Starwood Industries increased the growth of its sales over the last three years.					
5. Starwood Industries increased the growth of its return on investment over the last three years.					
6. Starwood Industries increased its profit margin on sales over the last three years.					
7. Starwood Industries strengthened its overall competitive position over the last three years.					

Thank You

APPENDIX B

LATANT VARIABLE SCORES – MEDIATED MODEL

Latent Variable Scores of Mediated Model										
Case ID	**SSP**	**CR**	**LIS**	**QIS**	**P/C**	**Q**	**DD**	**PI**	**TTM**	**OP**
1	0.074	-0.516	-0.427	-0.208	0.093	0.541	0.449	0.372	-0.417	0.008
2	-0.018	0.574	-0.649	-0.231	0.980	-0.458	0.449	0.867	-1.207	-1.189
3	-1.368	-0.050	-0.916	0.214	-0.842	1.021	0.449	0.867	-0.208	0.008
4	-0.636	-1.336	0.607	0.214	0.980	-0.800	-0.212	0.422	-0.166	-0.222
5	-0.602	-0.479	-0.131	-0.536	-0.890	0.061	0.449	-1.691	0.877	1.378
6	0.350	1.007	-0.131	-0.208	0.980	1.021	0.449	-0.907	-2.007	-0.647
7	0.534	1.360	0.853	0.191	-0.794	1.021	0.449	0.867	0.341	-0.054
8	-1.910	-0.516	-0.945	-1.391	-0.842	-0.909	-1.363	-1.691	-1.416	-0.222
9	0.129	-0.179	-0.181	0.236	0.045	-0.800	-0.872	0.084	1.086	0.659
10	-0.340	-0.828	0.506	0.437	0.045	-0.458	-2.332	-0.361	-0.671	-0.484
11	1.432	0.685	-1.332	0.975	0.980	1.021	0.926	0.867	0.283	-0.385
12	-0.951	-1.714	-1.233	-1.391	-0.842	1.021	0.926	-0.124	-0.208	-1.361
13	1.432	1.360	1.002	0.975	0.980	1.021	0.449	-0.801	-1.054	0.008
14	0.661	-0.490	-1.469	-3.756	0.980	0.541	-0.886	-3.234	-1.051	-1.201
15	-0.770	1.034	0.169	-0.310	-0.794	1.021	0.252	0.867	0.031	-0.310
16	1.195	0.640	0.115	0.975	0.980	1.021	0.926	0.033	0.832	-1.534
17	-0.432	0.894	1.222	0.729	-0.842	-0.458	0.449	0.867	-0.671	-0.953
18	1.026	0.241	0.714	0.729	0.980	0.571	0.449	0.867	0.283	1.320
19	1.432	1.360	1.222	0.975	0.093	1.021	0.926	0.867	1.382	1.550
20	1.432	1.360	1.222	0.975	0.980	1.021	0.926	0.867	1.382	1.550
21	1.432	1.360	1.222	0.975	0.980	1.021	0.926	0.867	1.382	1.550

Latent Variable Scores of Mediated Model										
Case ID	**SSP**	**CR**	**LIS**	**QIS**	**P/C**	**Q**	**DD**	**PI**	**TTM**	**OP**
22	1.432	1.360	1.222	0.975	0.980	1.021	0.926	0.867	1.382	0.008
23	-0.494	0.670	0.335	-0.208	-0.842	-0.428	0.926	0.867	-1.667	0.008
24	-0.568	-0.956	-0.651	-0.732	-0.842	-0.938	-2.024	0.084	-0.967	0.204
25	-0.321	0.148	0.271	0.293	0.045	-0.834	-0.212	0.529	-0.121	-0.009
26	0.293	0.163	-0.141	0.437	0.045	-0.354	-1.377	-2.400	-1.979	-0.341
27	-0.993	-0.545	-0.363	0.473	-1.778	-0.532	-1.560	-0.361	-0.908	0.023
28	-1.194	-0.435	0.259	-0.044	0.093	-0.463	-0.226	-0.964	-1.221	-0.213
29	-0.053	-0.219	-0.322	-0.244	-1.778	-0.458	-0.872	-1.742	-0.208	-0.811
30	-1.381	-0.138	-0.558	-0.723	-1.729	-1.463	-1.083	-1.014	-0.121	-0.696
31	-2.002	-2.393	-4.492	-3.756	0.980	1.021	0.926	0.867	1.382	1.081
32	0.534	-0.516	0.039	0.975	0.980	-0.909	0.266	0.867	0.832	-1.928
33	-0.927	0.640	0.589	0.975	0.093	0.571	0.926	-0.073	0.832	0.420
34	0.954	1.360	0.599	0.729	0.980	1.021	0.926	0.867	1.086	1.320
35	-2.002	-2.393	-1.635	-1.391	-2.665	-2.839	-2.698	-1.691	-2.217	-1.534
36	-0.578	0.640	-0.919	-0.712	-0.794	1.021	-0.226	-1.691	1.382	0.457
37	1.432	1.360	1.002	0.975	0.980	1.021	0.926	0.867	0.579	1.378
38	-0.009	-0.190	0.661	0.070	-0.842	-0.428	0.926	0.422	-0.800	-2.681
39	0.661	-0.916	0.032	0.460	0.980	1.021	0.926	0.372	0.088	-0.820
40	1.432	1.360	1.222	0.975	0.980	1.021	0.926	0.867	1.382	1.550
41	-0.774	-1.376	-0.196	-0.288	-0.842	-0.829	-0.422	0.084	-0.164	-0.661
42	-0.175	0.343	-0.039	-0.511	-1.729	-0.800	-0.408	-0.412	-0.164	-0.883
43	-0.999	-2.000	-0.904	-0.677	-1.729	-1.799	-1.363	-0.412	-0.922	-1.165
44	-0.285	-0.796	0.983	0.038	0.980	-0.909	-0.408	0.372	0.088	0.420

Latent Variable Scores of Mediated Model										
Case ID	**SSP**	**CR**	**LIS**	**QIS**	**P/C**	**Q**	**DD**	**PI**	**TTM**	**OP**
45	1.432	0.163	0.509	0.539	0.093	0.576	-0.212	0.529	0.581	0.722
46	-0.285	-0.796	0.827	0.250	0.980	-1.804	0.926	0.867	-0.166	0.008
47	-1.405	-0.516	-0.609	0.227	0.980	-0.909	0.449	-0.412	-0.417	0.846
48	0.321	-0.476	-0.297	0.214	0.045	-0.354	-0.226	0.529	0.327	0.961
49	0.608	0.221	0.589	-0.231	0.093	-1.804	-2.220	-0.412	0.832	0.895
50	0.321	-0.230	0.756	0.553	0.045	0.467	0.449	0.084	1.086	0.646
51	0.919	0.696	-0.207	-0.208	0.980	1.021	0.926	0.867	1.382	1.320

APPENDIX C

LATANT VARIABLE SCORES – NON-MEDIATED MODEL

Latent Variable Scores of Non-Mediated Model					
Case ID	**SSP**	**CR**	**LIS**	**QIS**	**OP**
1	0.134	-0.544	-0.207	-0.220	0.019
2	-0.672	0.618	-0.929	-0.130	-1.248
3	-1.541	-0.054	-1.083	0.183	0.019
4	-0.097	-1.385	0.753	0.183	-0.288
5	-0.773	-0.047	-0.088	-0.472	1.421
6	0.134	0.973	-0.088	-0.220	-0.580
7	0.020	1.323	1.014	0.272	0.330
8	-1.720	-0.544	-1.049	-1.405	-0.288
9	0.671	-0.046	0.053	0.093	0.604
10	-0.726	-0.869	0.373	0.509	-0.554
11	1.486	0.325	-1.545	0.966	-0.202
12	-0.581	-1.886	-1.181	-1.405	-1.383
13	1.486	1.323	1.177	0.966	0.019
14	0.335	-0.370	-1.498	-3.776	-1.224
15	-0.794	1.147	-0.117	-0.151	-0.221
16	1.094	0.795	0.172	0.966	-1.518
17	-0.870	0.832	1.177	0.729	-1.012
18	1.042	0.481	0.681	0.729	1.250
19	1.486	1.323	1.177	0.966	1.556
20	1.486	1.323	1.177	0.966	1.556
21	1.486	1.323	1.177	0.966	1.556

Latent Variable Scores of Non-Mediated Model					
Case ID	**SSP**	**CR**	**LIS**	**QIS**	**OP**
22	1.486	1.323	1.177	0.966	0.019
23	-0.794	0.474	0.172	-0.220	0.019
24	-0.603	-0.861	-0.490	-0.554	0.005
25	-0.390	0.130	0.263	0.204	0.097
26	0.190	-0.019	-0.091	0.509	-0.462
27	-0.321	-0.224	-0.298	0.542	0.169
28	-0.510	-0.516	0.053	0.003	-0.212
29	-0.180	-0.048	-0.638	-0.252	-0.639
30	-1.494	-0.043	-0.613	-0.766	-0.793
31	-1.864	-2.411	-4.360	-3.776	0.952
32	0.020	-0.544	0.053	0.966	-1.884
33	-0.926	0.795	0.420	0.966	0.452
34	1.264	1.323	0.766	0.729	1.250
35	-1.864	-2.411	-1.592	-1.405	-1.518
36	-1.118	0.795	-0.788	-0.637	0.425
37	1.486	1.323	1.177	0.966	1.421
38	-0.189	-0.369	0.464	-0.123	-2.690
39	0.335	-0.858	0.125	0.420	-0.715
40	1.486	1.323	1.177	0.966	1.556
41	-0.927	-1.387	0.138	-0.241	-0.847
42	-0.111	0.298	0.289	-0.568	-0.933
43	-0.704	-2.059	-0.873	-0.784	-1.252
44	-0.189	-0.756	0.844	0.017	0.452

Latent Variable Scores of Non-Mediated Model					
Case ID	**SSP**	**CR**	**LIS**	**QIS**	**OP**
45	1.486	-0.019	0.596	0.441	0.822
46	-0.189	-0.756	0.753	0.215	0.019
47	-1.148	-0.544	-0.619	0.305	0.744
48	0.348	-0.542	-0.377	0.183	0.974
49	0.893	0.268	0.420	-0.130	0.839
50	0.348	-0.371	0.916	0.564	0.669
51	1.094	0.648	-0.207	-0.220	1.250