Examining The Influence Of The Cultural Aspect Of Uncertainty Avoidance On Supply Chain Coordination

Nour Albuloushi, Griffith University, Australia
Eiman Algharaballi, University of Southern Queensland, Australia

ABSTRACT

The purpose of this study is to examine the influence of national culture on supply chain coordination. It investigates whether uncertainty avoidance (UA) influences information sharing (IS) trust and personal interest (PI), which are the main elements that influence supply chain coordination (SCC). This research adopts a survey methodology, followed by expert interviews used as a justification method for survey results. Survey data was collected from 138 international supply chain members, mainly from Middle East and Far East. A total of 11 people were selected as potential interviewees. These people worked in various departments in different companies and were of various nationalities. The findings revealed that the cultural aspect of uncertainty avoidance influences information sharing and trust. This study adds a new contribution to the literature on supply chain management (SCM), as noted in Burgees et al.'s (2006) review of supply chain literature, studies that examine the social aspect of supply chains, including culture, have been neglected.

Keywords: Supply Chain Coordination; National Culture; Uncertainty Avoidance; Information Sharing, Trust; Personal Interest

1. INTRODUCTION

Supply chain coordination is a vital part of business operation. In today's global society, supply chains can span many countries and cultures. Supply chains are made up of many entities. These entities include suppliers, manufacturers, distributors, retailers, and consumers (Arshinder, Kanda, & Deshmukh, 2008). Members of each entity within a supply chain are dependent on each other's decisions and this dependency has been growing as supply chains become increasingly global, with operations in various geographic locations all over the world (Arshinder et al., 2008). Research has demonstrated the main elements that are affected by members' decisions in a supply chain are information sharing, trust, and personal interest (Santos, Fogaca, Souza, Toledo, & Gandra, 2012). Despite the importance of decision-making in supply chains, little direct evidence is available on how decision-making in a supply chain is influenced by national culture. Members' behaviour towards these three elements (information-sharing, trust, and personal interest) could trigger coordination problems, as a typical supply chain is a human system that requires human interactions (Fisher, Raman, & McClelland, 1994).

2. RESEARCH QUESTION AND OBJECTIVE

It is hypothesized in this research that national culture explains many facets of an individual's behaviour in an organization and uncertainty avoidance is a cultural dimension that explains people's behaviour in unknown situations (Hofstede, 2010). Effective management incorporates cultural diversity as a key component in an international supply chain. There are three elements in a supply chain that are heavily influenced by people's behaviour: information sharing, trust, and personal interest (Santos, Fogaca, Souza, Toledo, & Gandra, 2012). A supply chain is an organization composed of a complex structure in which operations can spread across various countries. Therefore, this study's main objective is to examine whether UA influences IS trust and PI. By examining

culture's influence on people's behaviour towards information sharing, trust, and PI, where these are the main elements in a supply chain and influence SCC, a link can be established. Based on this objective, the following research question is addressed: What is the influence of the cultural aspect of uncertainty avoidance on supply chain coordination?

The next section of this study is the literature review, followed by research methodology, results, and lastly the conclusion.

3. LITERATURE REVIEW

3.1 Supply Chain Coordination and Perspectives

The dynamic structure of supply chains poses many different challenges, such as managing supply chain entities and members operating in a global presence. This can lead to supply chain vulnerability and expose the supply chain to challenges with coordination.

Larsen (2000) defines supply chain as:

Collaborative working for joint planning, joint product development, mutual exchange information and integrated information systems, cross coordination on the network, long term cooperation and fair sharing of risks and benefits. (p. 378)

Arshinder et al. (2008) reviewed the different definitional perspectives of coordination literature and find that such different perspectives of coordination do exist. The different definitions for supply chain coordination in the literature focus on different perspectives of coordination, such as information systems, information sharing, and members' behaviour. Of these many perspectives of supply chain coordination, the terms that appear most frequently focus on members' behaviour and information systems. The different perspectives and arguments indicate that the literature contains different approaches to supply chain coordination. Such perspectives arise from a strong multi-theoretic approach to coordination developing from the various disciplines, such as psychology, sociology, and information systems, which study supply chain coordination (Burgees, Singh, & Koroglu, 2006; Arshinder et al., 2008).

One perspective holds that coordinated supply chains come from having a well-established information system (Li, Kumar, & Lim, 2002; McLaren, Head, & Yuan, 2002). Relationships between supply chain members are asymmetric, often championing the introduction of information systems in the supplier network (Subramani, 2004). Information systems introduced in a supply chain are an unfortunate strategic necessity for partners (Barua & Lee, 1997), where such technologies are complex artefacts that lead to successful performance (Pentland, 1992). Despite the empirical evidence of the importance of information systems to supply chain coordination, Arshinder et al. (2008), Blakhurts, Graighead, Elkins, and Handfield (2005), and Rupp and Ristic (2000) declare that an overreliance on information systems can cause problems in areas like integration due to the complex structure of supply chains.

The other perspective argues that coordinated supply chains rely on partnerships, culture, and communication to implement coordination (Power, 2005; Barratt, 2004). Whether a supply chain uses any information systems or heavily relies on its members' behaviours to make decisions, decision-making is what triggers the movement of a supply chain and members. These members are involved with the data being shared either in person or put into an information system (Santos et al., 2012). Supply chain members often have conflicting goals and objectives regarding supply chain decisions and actions (Arshinder et al., 2008). When such behaviour exists, isolated decision-making weakens the supply chain system's performance (Park, 2005). Of the various elements mentioned in the literature, this study focuses on three elements that are highly influenced by behaviour: (a) information sharing, (b) trust, and (c) personal interest (Santos et al., 2012). The role of these elements is discussed briefly in the next section.

3.1.1 The Role of Information Sharing

Information sharing exists when members share accurate information at the right time about operational decisions and activities (Li & Wang, 2006). The nature of supply chains requires intensive information to coordinate, and the decision to share information openly between members is seen as the main tool that can reduce uncertainties (Mentzer et al., 2001). However, the decision to share information is influenced by a members' national culture. The influence of national cultural will guide an individual to channel information as either an opportunity or a threat, leading members to either communicate easily and become transparent and establish relationships or, conversely, to restrict information, and therefore reduce efficiency (Reimann, Lunemann, & Chase, 2008; Arshinder et al., 2008).

3.1.2 The Role of Trust

Francis Fukuyama's 'theory of trust' examines a society's ability to build successful organizations based on trustful relationships developed between people (2008). Stuart, Verville, and Taskin (2011) and Hofstede (2010) recognize that people's behaviour can be explained through their cultural background, which influences whether they feel trust in others. In particular, trustful relationships between members can be formed on the basis of culture (Cook et al., 2005).

3.1.3 The Role of Personal Interest

Supply chains can be defined as 'an interest-based cooperation aiming to reach their chosen objectives,' wherein personal interest plays an important role (Potocan, 2009, p. 121). The behaviour of members in a supply chain needs to be investigated from the viewpoint of their interests and objectives. Personal interests that are tied to a supply chain cannot be predicted because members' personal interests depend on each individual's values. These values are based on an individual's needs, knowledge, possibilities, and culture (Potocan, 2009). Mulej, Potocan, Zenko, Prosenak, and Hrast (2007) also state that personal interest is related to a person's cultural background; specifically, their culture's willingness to associate with risk.

3.2 National Culture and Uncertainty Avoidance

National culture is defined as the collective programming of the mind distinguishing the members of one group or category of people from another (Hofstede, 2010). National culture helps to explain members' behaviour as their decisions are heavily influenced by what they perceive as correct from their cultural background (Barkema & Vermeulen, 1997). It is through culture that people define themselves and the norms and values of a person are formed (Dartey-Baah, 2013). It is believed that members' behaviour can be explained through culture (Dartey-Bahh, 2013). Supply chains represent partnerships between organizations and require efficient management between organizations that can be affected by differences in culture (Power, 2005). Furthermore, supply chains require members to take risks (Santos et al., 2012) and uncertainty avoidance as a cultural dimension of Hofstede's theory explains people's behaviour in uncertain situations in which risk is involved (Hofestede, 2010).

4. THEORTICAL FRAMEWORK AND RESEARCH HYPOTHESES

4.1 Theoretical Background

Successful supply chains require commitment between supply chain partners through trust (Kwon & Suh, 2005), where trust and performance could be moderated by culture (Mullen, Budeva, & Doney, 2009). Trust is defined as 'the expectation that arises within a community of regular, honest, cooperative behaviour, based on commonly shared norms, on the part of other members of that community' (Fukuyama, 2008, p. 26). Fukuyama's theory states that the amount of trust developed in a society regulates that society's ability to develop large, successful organizations (Fukuyama, 2008). In his cultural dimension theory, Hofstede explains how cultural behaviour stems from an interpersonal place and how trust can be influenced by a member's willingness to tolerate risks. Geert Hofstede conducted one of the most comprehensive studies of how workplace values are influenced by culture (Hofstede, 2010). Shore and Venkatachalam (2003) advocates the use of Hofstede's cultural dimension

theory to explain behaviour patterns in many organizations and cultures, culture influences a business's performance non-intentionally.

Risk tolerance to uncertain situations is explained by Hofstede's cultural dimension of uncertainty avoidance, which examines members' behaviour in uncertain situations (Zaheer et al., 1998; Anderson & Narus, 1990; Schoorman et al., 2007). One of the key dimensions used as the main focus of this study is uncertainty avoidance. Uncertainty avoidance is associated with the way a society deals with the fact that the future can never be known (Hofstede, 2010). The relevance of choosing this dimension is that supply chains require members to take and share risks (Santos et al., 2012) and uncertainty avoidance may help to explain people's behaviour in uncertain situations where risk is involved.

The next section introduces the hypotheses development and this study's measurement instrument.

4.2 Hypotheses Development

Noted in Burgees et al.'s (2006) review of supply chain literature, studies that examine the social aspect of supply chains, including culture, have been neglected. Therefore, studies inspecting the influence of culture on organizations' performance in general will be used to glean insight into culture and its influence on supply chain coordination. Cultural values and norms have an effect on the flow and processing of information between different parties. By applying Hofstede's cultural dimension theory and Fukuyama's trust theory frameworks to this research, the dimension of uncertainty avoidance can be examined to see whether people perceive certain information as either an opportunity or a threat and the different ways they react (Reimann et al., 2008). Deriving from Hofstede's cultural dimension theory and Fukuyama's trust theory, the following hypothesis is addressed:

H1: There is a significant relationship between uncertainty avoidance and information sharing.

Trust may serve as a risk-taking component in terms of how it is built between individuals and organizations (Cook et al., 2005). According to Cook et al. (2005), the development of trust between parties involves the ability of each partner to take risks and transform them into trust relations. Since uncertainty avoidance involves the willingness of societies to tolerate risks, it is therefore expected that there is a relationship between trust and uncertainty avoidance, which can be observed by looking at the extent to which members consider their relationships trustful with other partners (Cook et al., 2005). On the role of uncertainty avoidance in information sharing, the following hypothesis is proposed:

H2: There is a significant relationship between uncertainty avoidance and trust.

Interests depend on individual values, which are based on a person's knowledge, needs, and possibilities (Potocan, 2009). Hence, professional behaviour concerning a supply chain's interest is influenced by a person's values, norms, culture, and ethics (Mulej et al., 2007). In an organizational context, uncertainty avoidance influences personal interest based on whether the decisions being made regarding personal interest are influenced by a member's tolerance to risk and uncertain situations (Ballou, Gilbert, & Mukherjee, 2000). It is reasonable to argue that uncertainty avoidance influences the extent to which personal interests is motivated by decisions associated with culture. This may be observed by noting a member's willingness to stay longer at a company to reduce risks and secure personal stability, as compared to the collective interests of a supply chain (Beekun, Stedham, & Yamamura, 2003; Altuncu, Aktepe, & Islamoglu, 2012). The above argument leads to the third hypothesis:

H3a: There is a significant relationship between uncertainty avoidance and personal interest.
H3b: There is a significant difference between a person's length of stay at their current supply chain and personal interest.

Jarvenpaa and Staples (2000) note that the flow of information sharing in a supply chain is influenced by a member's personal interest in the way that perceptions from culture and personal factors influences their behaviour towards sharing information. Also, trust exists when one party believes that the other party does not behave opportunistically (Villena, Revilla, & Choi, 2011). It is proposed in this study that there is a relationship between

trust in supply chain partners and personal interest. Based on Hofstedes theory, it is probable that partners fearful of unknown situations would trust less, resulting in less information sharing (Hofstede, 2010). The above discussion, which was developed from the literature, leads to the following main hypothesis and three sub hypotheses:

H4: There is a significant relationship between information sharing, trust, and personal interest.
H4a: There is a significant relationship between information sharing and trust.
H4b: There is a significant relationship between information sharing and personal interest.
H4c: There is a significant relationship between trust and personal interest.

Individuals from cultures that accept risks when faced with uncertain situations will tend to be contemplative and less emotional, more accepting of personal risk and relatively tolerant (Vitell et al., 1993). Individuals who do not tolerate risk and uncertain situations are more likely to trust less due to their feeling of insecurity and therefore share less information, which leads to a higher chance that opportunistic behaviour will take place (Kwon & Suh, 2005). Therefore, the above arguments support the following hypothesis:

H5: There is a significant difference between participants' country of origin and uncertainty avoidance.

4.3 Measures

The previous literature describes various constructs that measure the following variables: uncertainty avoidance, information sharing, trust, and personal interest. See Figure 1. These variables are used in this study's questionnaire and explained in the next sections.

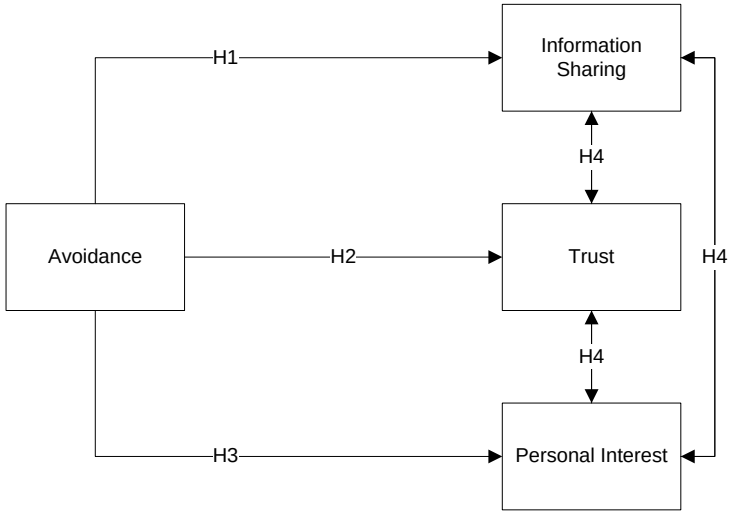

Figure 1: This Figure Illustrates the Conceptual Framework for the Five Hypotheses (H1, H2, H3, H4, H5) Investigated in this Study

4.3.1 Uncertainty Avoidance

Hofstede measures uncertainty avoidance with three main constructs: rules orientation, nervousness and stress, and stability. The first construct to assess uncertainty avoidance is rules orientation. This is measured by examining individuals' responses to questions concerning the importance they place on their companies' rules, following instructions and level of caution (Altuncu et al., 2012; Yan & Hunt, 2005; Rapp, Bernardi, & Bosco, 2011). The second construct evaluated in the questionnaire was individuals' responses to how often they feel stressed or nervous. Uncertainty avoidance explains members' behaviour regarding unknown situations and whether they feel stressed in response to unknown situations. In such instances, where members impose fear and anxiety towards establishing relationships, trust becomes harder to achieve (Potocan, 2009). The third construct of uncertainty avoidance is evaluated through looking at individuals' responses to the question 'How long do you think

you will continue working at this company?' Uncertainty avoidance refers to individuals' need for security, where individuals may feel threatened by unknown situations and hence require the need to feel secure (Potocan, 2009).

4.3.2 Information Sharing

Lalnode (1998) considers information sharing essential and describes it as one of the five building blocks for a solid supply chain. According to Li, Ragu-Nathan. B., Ragu-Nathan. T., and Rao (2004), the two key attributes of information sharing are quantity and quality. Quantity is the extent to which critical and important information is being communicated to one's supply chain partner. The information being shared could range from being strategic and/or tactical to information about logistics and general market information (Mentzer et al., 2001). Information quality includes aspects that aim to measure items like accuracy, timeliness, adequacy, and credibility of information being exchanged (Monczka et al., 2002; Moberg, Cutler, Gross, & Speh, 2003).

4.3.3 Trust

According to Kumar, Scheer, and Steenkamp (1995), trust encompasses two main elements: trust in partners' honesty and trust in partners' benevolence. In previous studies, honesty has been measured by looking at partners' honesty, truthfulness, and reliability (Kumar et al., 1995). Trust in partners' honesty encompasses the belief that the partner stands by their word (Anderson & Naurs, 1990) and is measured by looking at whether partners fulfil obligations and are sincere (Scheer & Stem, 1992). Studies have measured benevolence by observing whether partners are interested in their firm's welfare and discovering whether or not they will take actions that might negatively impact the firm (Kumar et al., 1995).

4.3.4 Personal Interest

As stated by Nagin, Rebitzer, Sanders, and Taylor (2002) opportunistic behaviour occurs as a result of having no or reduced monitoring. Individuals who value their ongoing employment the least would take advantage of this no monitoring policy and preference their personal interest over the company's. It has also been stated that workers will limit their opportunistic behaviour when they fear they will be dismissed from a job they value (Nagin et al., 2002). Therefore, personal interest can be measured by the willingness of an individual to cooperate and share information as described by Potocan (2009) and Ballou et al. (2000) and stability as outlined by Nagin et al. (2002).

5. RESEARCH METHODOLOGY

This research adopts a survey methodology, followed by expert interviews used as a justification method for survey results. Survey research has been extensively utilised as a research approach in the field of logistics and supply chain management and survey methodology within the supply chain field has been widely highlighted by researchers (Larson & Poist, 2004; Seuring & Kotzab, 2005).

According to Oppenheim (1992), interviewing is a straightforward method that can be used to investigate issues in depth. In this study, expert interviews were used as a validation. A one-to-one expert interview is a very effective method of collecting information about attitude and thoughts (Robson, 2002). The expert interviews were conducted on a one-to-one basis in the interviewees' offices at their companies. These interviews are semi-structured interviews. Semi-structured interviews are when the questions are predetermined but the orders of the questions are modified based on the interviewee's responses (Robson, 2002).

5.1 Survey Data

A total of 2,401 international supply chain members were contacted to participate in the survey. The target population is primarily upper managers and employees who work in a wide range of functions within a supply chain at multiple facilities in different departments. Due to such data not being available to the public or accessible, a third-party provider was given the specifications that the participants need to meet, and their database was used to retrieve the information. Out of the 2,401 surveys sent out, a total of 160 were received and assessed. Only 138 surveys were fully completed. The empirical results are based on these 138 completed surveys. As explained in

Table 1, 60 of the participants were from the Middle East (Kuwait, United Arab Emirates, Saudi Arabia, Lebanon, Oman, Egypt, Qatar, Sudan, Syria), 69 were from the Far East (China, India, Pakistan, Sri Lanka) and 9 were from other countries of origin (Australia, the UK, and Sweden). Table 2 shows that 114 of the participants were operating in Middle Eastern international supply chains, while the other 24 participants were from other operating international supply chains.

Table 1: Participants' Country of Origin

Location of Country of Origin	Number of Participants	Percentage
Far East	69	50.0
Middle East	60	43.5
Other	9	6.5
Total	138	100.0

Table 2: Supply Chains' Country of Origin

Location of Supply Chain	Number of Participants from Each Country of Origin	Percentage
Middle East	114	82.6
Other	24	17.4
Total	138	100.0

5.2 Expert Interview Data

A total of 11 people were selected as potential interviewees because of their background in supply chain management. These people worked in various departments in different companies and were of various nationalities as described in Table 3.

Table 3: Expert Profiles

Expert	Role	Country	Years of Experience	Company/Industry
A	Senior warehouse manager	Jordan	25 years	One of Kuwait's leading international food supply chains
B	Systems manager	India	10 years	Working at the same supply chain as Expert A
C	Operations management manager	Oman	10 years	Oman's top logistics company
D	Senior supervisor	Kuwait	15 years	Working at the Kuwaiti branch of an international supply chain
E	Planning manager	Kuwait	10 years	Working at the same supply chain as Expert D
F	Shipping manager	India	14 years	One of Kuwait's leading international fashion supply chains
G	Warehouse manager	India	15 years	Working at the same supply chain as Expert F
H	Customs and clearance supervisor	Egypt	10 years	Working at the Kuwaiti branch of an international logistics supply chain
I	Operations management manager	Jordan	20 years	Working at the Kuwaiti branch of an international logistics supply chain
J	Customs clearance manager	Palestine	11 years	Working at the Kuwaiti branch of an international logistics supply chain
K	Customs team leader	Lebanon	10 years	Working at the Kuwaiti branch of an international logistics supply chain

6. ANALYSIS AND DISCUSSION

6.1 Survey Analysis

The statistical methods used in this study to analyze the survey are cross tabulation, Cronbach alpha, Pearsons correlation and ANOVA.

6.1.1 Cross Tabulation

A cross tabulation test was conducted between the measure of length of stay at the current supply chain and the participant's country or origin. As shown in Table 4, a Chi-Square test for country of origin with length of stay at current supply chain indicated a significant association (Pearson Chi-Square = 0.001). To further investigate this association, a cross tabulation test between length of stay and country of origin is conducted. Table 5 shows that out of the 68 participants from the Far East, 17 would like to stay for two years, 15 for between two and five years, 20 for more than five, and 16 for until they retire. Out of 56 from the Middle East, however, five stated they wanted to stay for two years, six for between two and five, 16 for more than five and 29 for until they retire. Thus, the percentage of Middle Eastern participants' results levied heavier towards staying until they retire at the company than those from other countries. On the other hand, the percentages of participants from the Far East willingness to stay until they retire were less. This implies that cultural differences do exist when it comes to decision-making regarding personal stability towards length of stay at a company.

Table 4: Cross Tabulation between Length of Stay and Country of Origin Significance

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.001[a]	6	.001
Likelihood ratio	25.097	6	.000
Linear by linear association	12.342	1	.000
Number of valid cases	133		

Note: [a]: 4 cells (33.3%) have expected counts of less than 5. The minimum expected count is 1.42.

Table 5: Cross Tabulation between Length of Stay and Country of Origin

			Location of Country of Origin			Total
			Far East	Middle East	Other	
How long do you think you will work at this supply chain?	2 years	Count	17	5	0	22
		Percentage	77.3	22.7	0.0	100.0
	2-5 years	Count	15	6	0	21
		Percentage	71.4	28.6	0.0	100.0
	More than 5 years	Count	20	16	7	43
		Percentage	46.5	37.2	16.3	100.0
	Until I retire	Count	16	29	2	47
		Percentage	34.0	61.7	4.3	100.0
		Count	68	56	9	133
		Percentage	51.1	42.1	6.8	100.0

6.1.2 Reliability Statistics: Cronbach's Alpha

Reliability testing ensures that the instrument and measurement scales employed in the questionnaire are reliable. Cronbach's alpha looks at the internal consistency of variables and is one of the most commonly used forms of reliability testing (Pallant, 2013). Data is considered reliable based on a scale of 0 to 1, where a 0.7 and above is considered to be a reliable measures (Pallant, 2013). Table 6.1 indicates the internal consistency of all 18 items was 0.7. Thus, the measures used in the survey questionnaire of this study are reliable.

Table 6.1: Reliability Statistics

Cronbach Alpha	Number of Items
0.695	18

6.1.3 Pearson's Correlation

Pearson's correlation is used to determine the strength and direction of the linear relationship between variables (Pallant, 2013). One of the most important assumptions with the Pearson's correlation is that the data is normally distributed. Normality was assessed using skewness and kurtosis, which revealed that data in this study is normally distributed (Pallant, 2013).

The correlation results are presented in Tables 6.2, 7, 8, and 9. Table 6 shows that the strongest correlation was found between uncertainty avoidance and information sharing (r = 0.409, sig = 0.000, < 0.05). Looking at these

significant results, H1 is shown to be true. Table 7 shows a weak correlation between the dimension of uncertainty avoidance and trust, though it is significant (r = 0.218, sig < 0.05). Therefore H2 is accepted. The results in Table 8 shows that there is no significant relationship between uncertainty avoidance and personal interest (sig = 0.139 > 0.05), as a result H3 is rejected.

Hypotheses 4a to 4c address the correlation between information sharing, trust, and personal interest. Table 9 shows that no relationship was found between information sharing and trust (sig = 0.888 > 0.05) and no relationship was also found between trust and personal interest (sig = 0.852 > 0.05); however, a significant relationship was found between information sharing and personal interest (r = 0.235, sig = 0.007 < 0.05). The statistical results show that H4 is partially accepted. The key results of the correlation testing are summarized in Figure 2.

Table 6.2: Correlation between Uncertainty Avoidance and Information Sharing

		Avoidance	Information
Avoidance	Pearson's Correlation	1	.409**
	Sig. (2-tailed)		.000
	N	134	132
Information	Pearson's Correlation	0.409**	1
	Sig. (2-tailed)	.000	
	N	132	136

** Correlation is significant at the 0.01 level (2-tailed).

Table 7: Correlation between Uncertainty Avoidance and Trust

		Avoidance	Trust
Avoidance	Pearson's Correlation	1	0.218*
	Sig. (2-tailed)		0.011
	N	134	134
Trust	Pearson's Correlation	0.218*	1
	Sig. (2-tailed)	0.011	
	N	134	137

* Correlation is significant at the 0.05 level (2-tailed).

Table 8: Correlation between Uncertainty Avoidance and Personal Interest

		Avoidance	Personal
Avoidance	Pearson's Correlation	1	0.130
	Sig. (2-tailed)		0.139
	N	134	130
Personal	Pearson's Correlation	0.130	1
	Sig. (2-tailed)	0.139	
	N	130	133

Table 9: Correlation between Uncertainty Avoidance, Information Sharing, Trust, and Personal Interest

		Information	Trust	Personal
Information sharing	Pearson's Correlation	1	.147	.235**
	Sig. (2-tailed)		.088	.007
	N	136	135	131
Trust	Pearson's Correlation	.147	1	-.016-
	Sig. (2-tailed)	.088		.852
	N	135	137	132
Personal interest	Pearson's Correlation	.235**	-.016-	1
	Sig. (2-tailed)	.007	.852	
	N	131	132	133

** Correlation is significant at the 0.01 level (2-tailed).

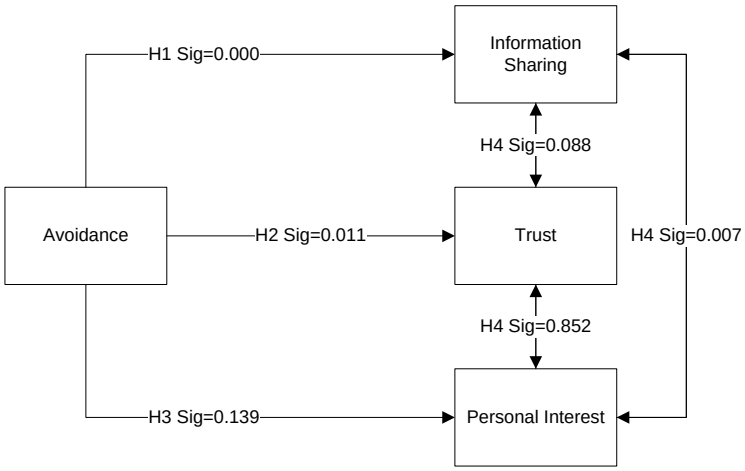

Figure 2: Correlation Testing Summary
This figure illustrates a summary of the correlation testing results.

6.1.4 Analysis of Variance (ANOVA)

The final statistical method used in this study is to show the variability between one categorical variable with two or more items is a one-way ANOVA (Pallant, 2013). Hypotheses H3b and H5 both have variables that are categorical and a one-way ANOVA has been conducted to examine the differences in means of each category (Pallant, 2013). When a significant difference is found between variables, a post hoc test is conducted to see which categories are causing the significant difference (Pallant, 2013). A further test, effect size test, is also used to show the strength of the difference between variables groups. A calculation of eta squared (sum of squares between groups divided by total sum of squares) that will result in 0.01 is considered a small effect size, 0.06 is considered medium and 0.14 is considered a large effect size (Pallant, 2013).

A one-way Anova analysis of variance was conducted between groups to study the impact of length of stay on personal interest. Subjects were divided into four groups, as per Hofstede's study, to measure stability (Group 1: 2 years, Group 2: 2–5 years, Group 3: More than 5 years, and Group 4: Until I retire).

A significant difference between length of stay and personal interest has been found as shown in Table 10.1 and Table 10.2 (M1 = 2.18, M2 = 2.54, M3 = 3.00, M4 = 3.47, sig = 0.000 < 0.05). Based on these results H3b is supported.

A post hoc test has been used based on the significant difference results between personal interest and length of stay.

Table 10.1: ANOVA Differences in Means between Length of Stay and Uncertainty Avoidance, Information Sharing, Trust, and Personal Interest

(I) How long do you think you will work at this supply chain?		Uncertainty Avoidance	Information Sharing	Trust	Personal Interest
2 years	Mean	3.4571	3.9545	3.2273	2.1818
	N	21	22	22	22
	Std. Deviation	0.49048	0.35048	0.55048	0.32898
2-5 years	Mean	3.7048	3.7619	2.9048	2.5476
	N	21	21	21	21
	Std. Deviation	0.57834	0.77652	0.59935	0.52213
More than 5 years	Mean	3.5905	3.8963	2.9524	3.0000
	N	42	41	42	43
	Std. Deviation	0.52998	0.64220	0.55557	0.67259

Table 10.1 cont.

Until I retire	Mean	3.6348	3.8883	2.9628	3.4787
	N	46	47	47	47
	Std. Deviation	0.66172	0.69119	0.53664	0.65073
Total	Mean	3.6031	3.8817	2.9943	2.9624
	N	130	131	132	133
	Std. Deviation	0.58029	0.64176	0.55899	0.75785

Table 10.2: ANOVA Significance Report

		Sum of Squares	df	Mean Square	F	Sig.
Uncertainty avoidance	Between groups	0.717	3	0.239	0.705	0.551
	Within groups	42.721	126	0.339		
	Total	43.439	129			
Information sharing	Between groups	0.429	3	0.143	0.342	0.795
	Within groups	53.112	127	0.418		
	Total	53.541	130			
Trust	Between groups	1.483	3	0.494	1.604	0.192
	Within groups	39.450	128	0.308		
	Total	40.933	131			
Personal interest	Between groups	29.608	3	9.869	27.555	0.000
	Within groups	46.204	129	0.358		
	Total	75.812	132			

Table 10.3 illustrates the results of the ANOVA post hoc test. The 'Until I retire' category has a significant difference with the three previous categories (Sig < 0.05), and it presents that the categories '2 years' and '2–5 years' have no significant differences. This shows that H3b has been accepted due to the difference arising between people's personal interest who are willing to stay until they retire as compared with people willing to stay for 2 or 2–5 years.

Table 10.3: ANOVA Post Hoc Test

(I) How long do you think you will work at this supply chain?	(J) How long do you think you will work at this supply chain?	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
2 years	2-5 years	-0.36580-	0.18258	0.192	-0.8410-	0.1094
	More than 5 years	-0.81818-*	0.15688	0.000	-1.2265-	-0.4099-
	Until I retire	-1.29691-*	0.15460	0.000	-1.6993-	-0.8945-
2–5 years	2 years	0.36580	0.18258	0.192	-0.1094-	0.8410
	More than 5 years	-0.45238-*	0.15933	0.027	-0.8671-	-0.0377-
	Until I retire	-0.93110-*	0.15709	0.000	-1.3400-	-0.5222-
More than 5 years	2 years	0.81818*	0.15688	0.000	0.4099	1.2265
	2-5 years	0.45238*	0.15933	0.027	0.0377	0.8671
	Until I retire	-0.47872-*	0.12629	0.001	-0.8074-	-0.1500-
Until I retire	2 years	1.29691*	0.15460	0.000	0.8945	1.6993
	2-5 years	0.93110*	0.15709	0.000	0.5222	1.3400
	More than 5 years	0.47872*	0.12629	0.001	0.1500	0.8074

* The mean difference is significant at the 0.05 level.

Table 10.4 displays the eta squared test (= 0.39) of which has been used to evaluate the effect size between the groups set for length of stay, which indicates that there is a large effect size. This signifies that there is a large difference in personal interest between the groups '2 years,' '2–5 years,' 'More than 5 years,' and 'Until I retire.'

Table 10.4: ANOVA Effect Size (Measure of Association)

	Eta	Eta Squared
Personal: How long do you think you will work at this supply chain?	0.625	0.391

Another ANOVA test has been conducted to examine the impact of the participant's country of origin on uncertainty avoidance, information sharing, trust, and personal interest. The subjects were divided into three groups (Group 1: Far East, Group 2: Middle East, Group 3: Other). The results displays that the country of origin of participants has an impact on uncertainty avoidance, which can be seen through the mean differences in (M1 = 3.54, M2 = 3.76, M3 = 3.26, sig = 0.015 < 0.05); hence, H5 is accepted. The results of the ANOVA test are displayed in Table 11.1 and Table 11.2.

Table 11.1: ANOVA Differences in Means between Country of Origin and Uncertainty Avoidance, Information Sharing, Trust, and Personal Interest

Country of Origin		Avoidance
Far East	Mean	3.5403
	N	67
	Std. Deviation	0.48992
Middle East	Mean	3.7690
	N	58
	Std. Deviation	0.62329
Other	Mean	3.2667
	N	9
	Std. Deviation	0.75498
Total	Mean	3.6209
	N	134
	Std. Deviation	0.58414

Table 11.2: ANOVA Significance Report

		Sum of squares	df	Mean square	F	Sig.
Uncertainty avoidance	Between groups	2.836	2	1.418	4.366	0.015
	Within groups	42.545	131	0.325		
	Total	45.381	133			

Table 11.3 displays the results of the post hoc test of the country of origin category with uncertainty avoidance, which showed a significance difference (sig < 0.05). The significant result came mainly from the difference between the category 'Middle East' and 'Other,' where 'Far East' has no significant differences. Referring back to H5, this indicates that people from the Middle East have a different degree of tolerance to uncertainty avoidance as compared with people from other countries.

Table 11.3: ANOVA Post Hoc Test

(I) Country of Origin	(J) Country of Origin	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Far East	Middle East	-0.22867-	0.10221	0.069	-0.4710-	0.0136
	Other	0.27363	0.20232	0.369	-0.2060-	0.7533
Middle East	Far East	0.22867	0.10221	0.069	-0.0136-	0.4710
	Other	0.50230*	0.20417	0.040	0.0183	0.9863
Other	Far East	-0.27363-	0.20232	0.369	-0.7533-	0.2060
	Middle East	-0.50230-*	0.20417	0.040	-0.9863-	-0.0183-

* The mean difference is significant at the 0.05 level.

Eta squared test (= 0.062) shown in Table 11.4 has been used to evaluate the difference between the groups set for country of origin. It shows that there is a medium difference between the groups 'Middle East,' 'Far East,' and 'Other.'

Table 11.4: ANOVA Effect Size (Measure of Association)

	Eta	Eta Squared
Avoidance/Country of origin	0.250	0.062

6.2 Expert Interview Results

All interviewees agreed that information sharing is essential in a supply chain. They mentioned that they can share information openly with internal partners and do not feel they need to worry about avoiding uncertainty with them while sharing information. However, the information shared with the external partners may be limited due to the uncertainties about sharing information with them. With trust, respondents answered that information sharing is not directly linked to trust in the supply chain field, due to supply chains relying strongly on documentation. Some respondents believe that documentation is more important than trust, since trusting others is risky.

Respondents also added that there is no link between trust and personal interest and that the decision to share information is highly associated with whether that information would put their personal job at a risk. Regarding personal interest, some respondents revealed that personal interest differs from person to person based on their attitude, initiative, motivation, and environment, while others remark that their department and job does not allow them to take into consideration their personal interest. It was further explained by the interviewees that personal interest and length of stay are closely related to each other, as respondents agreed that personal interest is related to security, salary, and stability.

To summarize, the results of the interviews show that no relationship exists between trust and information sharing since documentation is essential and needed regardless of trust. In addition, there is no relationship between IS and trust. This magnifies the essential role of documentation monitoring in supply chains. The interview results suggest that flow of information is based on how such information influences an individual's personal interest and position in the company. Thus, a relationship between information sharing and personal interest exists.

7. CONCLUSION

Results from this study show that uncertainty avoidance is a cultural dimension that differs based on country of origin and influences information sharing and trust in a supply chain. Furthermore, supply chains require members to take risks and work in an international context. Thus, this study revealed that culture influences SCC indirectly through the findings that culture influences information sharing and trust. These two elements of which are influenced by peoples' culture in turn influence supply chain coordination. Concerning uncertainty avoidance having to do with members' personal interest, it has been concluded that uncertainty avoidance does not influence members' personal interest. However, length of stay is associated with personal interest as members' willingness to stay longer at a company is due to their need to secure stability and avoid their fear of facing uncertain situations. There is no relationship between trust and information sharing since documentation is essential and needs to be shared regardless of trust. In addition, there is no relationship between information sharing and trust. Documents and actions taken are monitored as part of company procedure and policy regarding transparency as required by employment contracts, not because of a lack of trust. Further, information sharing is tied to personal interest and that the decision to share information with others is based on how it would affect a person's position in the company.

8. IMPLICATIONS

This study observes and documents members' behaviour in an international supply chain, examining their views on information sharing, trust, and personal interest, where these members come from different cultural backgrounds. Therefore, supply chain managers could find the results of this research useful in assessing improvements to supply chain coordination. An interesting finding of this research is that the cultural aspect of uncertainty avoidance influences the flow and processing of information sharing and trust, which makes an interesting implication for managers to consider when evaluating coordination mechanisms. In addition, as noted in Burgees et al. (2006), studies examining the social aspects of supply chains including culture have been neglected, where the focus of this research makes a new contribution to the literature by studying the influence of culture on supply chain coordination.

9. LIMITATION

In this particular study, data availability was a major concern. There were no available electronic contact lists for members working in global supply chains. The challenges involved in data collection resulted in a small

number of responses and people contacted were initially either too busy or had confidentiality restrictions preventing them from participating.

AUTHOR INFORMATION

Nour Albuloushi is a Griffith University Australia graduate, with a bachelor degree in Logistics and Supply Chain Management and a master honours degree in International Business. Her research interests include international business, supply chain management, value chains, and cross culture management. E-mail: noonoo91@hotmail.com (Corresponding author)

Eiman A. Algharaballi, PhD, CPA, APA is Associate Professor of Accounting at the college of Business Studies in Kuwait. She holds a PhD in accounting from University of Southern Queensalnd (USQ), Australia. She is a certified public accountanct in Kuwait, the Ministry of Commerce and Industry and Accredited Professional Accountant (APA), the American Institute for Financial Business and Research.

REFERENCES

1. Altuncu, Y., Aktepe, S., & Islamoglu, G. (2012). Preliminary study for the development of uncertainty avoidance instrument in Turkey. *Journal of Business, Economics & Finance, 1*(4), 2146-7943.
2. Anderson, J., & Narus, J. (1990). A model of distributor firm and manufacturer firm working partnerships. *Journal of Marketing, 54*(1), 42-58.
3. Arshinder, K., Kanda, A., & Deshmukh S. G. (2008). A review on supply chain coordination: Coordination mechanisms, managing uncertainty and research directions. *International Journal of Production Economics, 115*(2), 39-82.
4. Ballou, R., Gilbert, S., & Mukherjee, A. (2000). New managerial challenges from supply chain opportunities. *Industrial Marketing Management, 29*(1), 7-18.
5. Barkema, H., & Vermeulen, F. (1997). What differences in the cultural backgrounds of partners are detrimental for international joint ventures? *Journal of International Business Studies, 28*(4), 845-864.
6. Barratt, M. (2004). Understanding the meaning of collaboration in the supply chain. *Supply Chain Management International Journal, 9*(1), 30-42.
7. Barua, A., & Lee, B. (1997). An economic analysis of the introduction of an electronic data interchange systems. *Information systems research, 8*(4), 398-422.
8. Beekun, R., Stedham, Y., & Yamamura, J. (2003). Business ethics in Brazil and the U.S: A comparative investigation. *Journal of Business Ethics, 42*(3), 267-279.
9. Blackhurst, C., Craighead, C., Elkins, D., & Handfield, R. (2005). An empirically derived agenda of critical research issues for managing supply-chain disruptions. *International Journal of Production Research, 43*(19), 4067-4081.
10. Burgees, K., Singh, P., & Koroglu, R. (2006). Supply chain management: A structured literature review and implications for future research. *International Journal of Operations & Production Management, 26*(7), 703-709.
11. Cook, K., Yamagishi, T., Cheshire, C., Copper, R., Matsude, M., & Mashima, R. (2005). Trust building via risk taking: A cross-societal experiment. *Social Psychology Quarterly, 68*(2), 121-142.
12. Fisher, M., Raman, A., & McClelland, A. (1994). Rocket science retailing is almost here: Are you ready? *Harvard Business Review, 72*(3), 83-93.
13. Fukuyama, F. (2008). *Trust: The social virtues and the creation of prosperity*. Free Press.
14. Hofstede, G. (2010). *National culture dimensions*. Retrieved from http://geert-hofstede.com/national-culture.html
15. Jarvenpaa, S., & Staples, D. (2000). The use of collaborative electronic media for information sharing: An exploratory study of determinants. *Journal of Strategic Information Systems, 9*(2), 129-154.
16. Kumar, N., Scheer, L., & Steenkamp, J. (1995). The effects of perceived interdependence on dealer attitudes. *Journal of Marketing Research, 32*(3), 348-356.
17. Kwon, I., & Suh, T. (2004). Factors affecting the level of trust and commitment in supply chain relationships. *Journal of Supply Chain Management, 40*(2), 4-14.

18. Larsen, S. (2000). European logistics beyond 2000. *International Journal of Physical Distribution Logistics Management, 30*(6), 377-387.
19. Larson, P., & Poist, R. (2004). Improving response rates to mail surveys: A research note in. *Transportation Journal, 43*(4), 67-75.
20. Li, X., & Wang, Q. (2006). Coordination mechanisms of supply chain systems. *European Journal of Operational Research, 179*(1), 1-16.
21. Li, Z., Kumar., A., & Lim, YG. (2002). Supply chain modeling: A coordination approach. *Integrated Manufacturing Systems, 13*(8), 551-561.
22. McLaren, T., Head, M., & Yuan, Y. (2002). Supply chain collaboration alternatives: Understanding the expected costs and benefits. *Internet Research, 12*(4), 348-364.
23. Mentzer, T., Dewitt, W., Kleeber, S., Min, S., Nix, W., Smith, D., & Zacharia, D. (2001). Defining supply chain management. *Journal of Business Logistics, 22*(2), 1-25.
24. Mulej, M., Potocan, V., Zenko, Z., Prosenak, D., & Hrast, A. (2007). What will come after investment, innovation and affluence phases of social development? In J. Sheffield & K. Fielden (Eds), *ANZSYS* (pp. 2-5). Auckland, NZ: ISCE.
25. Nagin, D., Rebitzer, J., Sanders, S., & Taylor, L. (2002). Monitoring, motivation and management: The determinants of opportunistic behaviour in a field experiment. (Working Paper No. 8811). National Bureau of Economic Research.
26. Oppenheim, A. (1992). *Questionnaire design, interviewing and attitude measuremen*t (2nd ed.). London: Continuum International Publishing Group.
27. Pallant, J. (2013). *SPSS survival manual* (5th ed.). NSW: National Library Australia.
28. Park, Y. (2005). An integrated approach for production and distribution planning in supply chain management. *International Journal of Production Research, 43*(6), 1205-1224.
29. Pentland, B. (1992). Organizing moves in software support hot lines. *Administrative Science Quarterly, 37*(4), 527-548.
30. Potocan, V. (2009). Does trust influence supply chain management. *Journal of American Academy of Business, 15*(1), 118-124.
31. Power, D. (2005). Supply chain management integration and implementation: A literature review. *Supply Chain Management International Journal, 10*(4), 252-263.
32. Rapp, J., Bernardi, R., & Bosco, S. (2011). Examining the use of Hofstede's uncertainty avoidance construct in international research: A 25 year review. *International Business Research, 4*(1), 3-15.
33. Reimann, M., Lunemann, U., & Chase, R. (2008). Uncertainty avoidance as a moderator of the relationship between perceived service quality and customer satisfaction. *Journal of Service Research, 11*(1), 63-73.
34. Robson, C. (2002). *Real world research* (2nd ed.). Oxford: Blackwell Publishers.
35. Rupp, T., & Ristic, M. (2000). Fine planning for supply chains in semiconductor manufacture. *Journal of Materials Processing Technology, 107*(1-3), 390-397.
36. Santos, F., Fogaca, D., Souza, R., Toledo, R., & Gandra, M. (2012). Cultural dimensions of agile supply chain management. *Proceedings of the POMS 22nd Annual Conference, University of Sao-Paulo*. Chicago, USA.
37. Scheer, K., & Stem, L. (1992, February 29). The effect of influence type and performance outcomes on attitude toward the influencer. *Journal of Marketing Research*, 128-42.
38. Seuring, S., & Kotzab, H. (2005). The role and importance of survey research in the field of supply chain management. In M. Müller & G. Reiner (Eds.), *Research methodologies in supply chain management.* (pp. 125-137). Frederiksberg, Denmark: Physica-Verlag HD.
39. Shore, B., & Venkatachalam, A. (2003). Evaluating the information sharing capabilities of supply chain partners: A fuzzy model. *International Journal of Physical Distribution & Logistics Management, 33*(9), 804-824.
40. Stuart, F., Verville, J., & Taskin, N. (2011). Trust in buyer-supplier relationships. *Journal of Enterprise Information Management, 25*(4), 392-412.
41. Subramani, M. (2004). How do suppliers benefit from information technology use in supply chain relationships? *MIS Quarterly, 21*(8), 45-73.
42. Villena, V., Revilla, E., & Choi, T. (2011). The dark side of buyer-supplier relationships: A social capital perspective. *Journal of Operations Management, 29*(6), 561-576.

43. Vitell, S., Nwachukwu, S., & Barnes, J. (1993). The effects of culture on ethical decision-making: An application of Hofstede's typology. *Journal of Business Ethics, 12*(10), 753-760.
44. Yan, J., & Hunt, J. (2005). A cross cultural perspective on perceived leadership effectiveness. *International Journal of Cross Cultural Management, 5*(1), 49-66.