ISSN: 2394-7659
IMPACT FACTOR- 3.775

International Journal of Engineering Researches and Management Studies

DISRUPTION IN THE BUSINESS ENVIRONMENT: IMPACT ON INTERNATIONAL CONTRACTS

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ABSTRACT
The US Navy has switched its contract vehicle from a firm-fixed-price indefinite delivery/indefinite quantity (five year) contract cycle to a short-term (two to five days) contract. Many companies now face a weekly procurement burden regionally in Asia Pacific region. The purpose of this research is to find out the impacts due to the implementation of the multiple award contract vehicles and to find some solutions to sustain the disruption in this business environment.

The data were collected from 192 respondents predominantly from supply chain background from leading marine companies like Marine Trader, Marine Service Provider, Port Authority, Supply Chain professionals. Structural equation modelling (SEM) was used to analyze data, as it is a popular statistical technique because of its ability to model selected independent variables and take into account all possible forms of measurement error to test an entire theory.

Keywords: *Contract administration, supply chain management, exogenous, endogenous risks, acquisition cycle time.*

1. INTRODUCTION

Wong (2006, p.4) mentions that the advent of the multiple award contract vehicle (hereafter referred to as MAC) was due to the Federal Acquisition Streamlining Act of 1994, after which multiple award task and delivery orders became attractive and popular in several procurement offices in the US government. Wong (2006) makes several relevant observations on problems with MAC, including lack of competition; overly broad statements of work; US government contracting agencies selecting favorite contractors without seeking real competition; less restriction and oversight; and US government procurement agencies favoring a contractor with whom they have experience, or whom they know or like, without re-competing each award and without guaranteeing low price or best value.

Their research shows the limitations of MAC to be striking a balance between the promotion of MAC and competition, retention of experienced contractors, and administrative problems in MAC contract oversight.

Duncan and Hartl (2015, pp.55–58) are unsure about the MAC process they state that a MAC contract may not be the most efficient and effective contract method, or may not meet the overall objective for the US Navy. They see its limitations as supply chain inefficiency and effectiveness over time for the MAC program and strategy.

Williams, Rose, and Rehwinkel (2010) state that prior to 2004, the US government used a firm-fixed price contract structure. In 2013, Navy Regional Maintenance Centers and NAVSEA set out to create the multiple award contract-multiple order (MAC) contract strategy. Their research analyzed MAC contracts and compared/contrasted them with previous strategies in order to determine the efficiency and effectiveness of this method. In 1999, a study by the Office of Federal Procurement Policy (OFPP) described the benefits of using MACs. Specifically, it stated that MACs allowed the government to continuously use competition, resulting in lower prices, better quality, reduced time from requirements identification to award, and improved contractor performance. The perceived limitations were long-term quality, outsourcing problems, and supply chain management risks.

Most of the research available highlights the MAC from the US government's point of view and there are limited findings on regional supply chain or supplier impact. In this research, we have taken the limitations identified in these papers to understand the pain-points within the supply chain due to adoption of the MAV in the husbanding service industry.

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2. REVIEW OF LITERATURE AND RESEARCH STRUCTURE

Problems faced in the husbanding service industry (hereafter referred to as HS) due to implementation of the MAC vehicle in the Asia Pacific Region are enumerated below.

2.1 Contractor Default Risk

Eckerd and Girth (2016) explains when exogenous risk is high and endogenous risk is low, fixed price contracts are preferred by suppliers. On the other hand, when endogenous risk is high but exogenous risk is low, buyers take most of the risk. If endogenous and exogenous risks are both high, buyers and suppliers share the risk by agreeing to incentive contracts. In the case of the US Navy HSP contract in the MAC environment, all such risks are passed on to the HS contractor.

Endogenous risks

According to Folta (1998, p.1010), firms can act to decrease endogenous uncertainty—for example, through services, supply chain measurement complexity, and products. Peck (2005) stated that commercial daily supply chain tasks can be managed with innovations, but government supply chains are controlled by political authorities who take major decisions on whether or not to purchase goods/services in the supply chain. Political actors' responses to regional foreign policy are often unpredictable. Some may be relatively resilient to external events, while others may not in sectors like aerospace or military procurement. These sectors reside in extremely volatile environments. US Navy HS contracts under the MAC model are one such overseas procurement which is dominated by the political influence of the US government. The contracting office does not assume any risks under the US government or its client, the US Navy, to operate these contracts. Therefore, the investment, and the building up of resources and financial and operational risks is borne by the suppliers and HS contractor in the Asia Pacific region. On a regional scale of more than twenty countries in the Asia Pacific region, these risks comprise a significant cost burden to the supply chain partners in each country for every procurement carried out on behalf of the US government.

H1: Contractor default risk arising out of exogenous and endogenous risks could have a very significant impact on the business revenue of suppliers.

Exogenous risks

According to Folta (1998, p.1011), firms' actions do not affect exogenous uncertainty. Exogenous risks arise out of the political system, legal institutions, bureaucratic processes, and geopolitics. Weber and Mayer (2014) mention that in order to reduce endogenous costs, the total costs of the exchange are kept low enough to deal with the exogenous uncertainty. As exogenous risks are not manageable in several cases, exchange partners (suppliers in this case) will seek to have a mutual understanding of the terms of the exchange in order to keep exogenous risks as low as possible.

H2: Contractor default risk arising out of exogenous and endogenous risks could have a significant impact on the competitive outsourcing strategies of suppliers.

Business Revenue

Kotabe et al. (2008) noted that limited outsourcing practices provide optimal results. Firms could experience several types of risk factor whilst pursuing outsourcing processes: these are not limited to factors such as increases in transaction costs, unfavorable opportunistic behaviors from partners, limited innovative capabilities, increases in internal dependency, and takeover vulnerability. Business revenue generation in an organization in the marine industry sector could be impacted by all the factors listed above.

Low return on investment

The average cost of an old hopper, tank, deck, crane or a self-propelled barge could range between 400,000 USD and 750,000 USD depending upon the end specifications and life selected for the barge (Maritime Sales, 1999). In order to recover the cost of a single barge in the MAC environment, an organization would have to win almost all port visits every week for a period of three years, if not more.

H3: Business revenue impacts the effectiveness of the supply chain due to low return on investment and loan risks in the Asia Pacific region.

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Loan risks

The whole HS industry in Asia depends on outsourcing to SMEs in the marine industry to perform on their behalf, driving down costs and being competitive in MAC environment. These SMEs have little or no financial strengths to withstand any market fluctuations. They have a severe inability to pay loans to foreign investors such as MLS whenever private financial support is provided to some of the SMEs in some ports in the Asia Pacific region.

Harvie and Charoenrat (2015) state in their research that SMEs' role and contributions have changed and evolved with the process of globalization and regional integration to remain internationally competitive. However, SMEs in Asia Pacific are identified as a risk priority for probable foreign investment.

H4: Low business revenue further increases administration problems for suppliers due to low return on investment and loan risks.

Competitive Outsourcing

Kang, Wu, Hong, and Park (2012, p.1197) state that efficiency and innovation-seeking outsourcing are key to business success. These techniques achieve substantial cost reductions, strategically aligning firms' goals with the professional management capabilities of suppliers, utilizing their economies of scale and enhancing operational efficiency to overcome existing internal inefficiencies and eliminate problematic bottleneck processes. These competitive outsourcing methods could find new opportunities to create value for customers from surrounding business networks. All firms need to do is explore and recruit suppliers that have suitable capabilities and utilize their strengths to penetrate markets with shorter lead times and lower costs. In a regional HS contract, it is impossible for any organization to acquire marine assets worth millions to service the US Navy in the whole region singlehandedly. Hence, competitive outsourcing by high quality firms is key to customer satisfaction.

Procurement lead time

Perry, Silins, and Embry (1986) state in their research that the US government Department of Defense (DOD) has distinctly ignored or disregarded the impact of procurement lead time, which has a direct relationship with investment, demand forecast accuracy, service turbulence, and supply chain system responsiveness. In the case of the HS industry, the lead time taken by the US government to make concrete decisions is substantially higher than the time allowed to HS contractors to outsource the services in the region. As a result, there is plenty of contract variance prior to and post award, since understanding of the scope to the last link in the supply chain is consumed by contracting offices in their decision making and very little time is left for suppliers to react to the continuous changes brought forward post award of the business. As a result, risks are assumed by the suppliers, again to survive the competition and stay compliant with the HS contract.

Tradeoff: LPTA/no scope tolerance

Goodman (2015) states in his paper that the lowest price technically acceptable (LPTA) method of outsourcing provides advantage to low quality suppliers, because the process reverses the basic incentive structure of product and service competition. This method tunes the market to undermine best value and tradeoff sourcing practices whereby the industry gets appropriate compensation to produce the best product/service possible and sell it at its best price. However, with LPTA, the compensation structure is for suppliers to reduce the price point as long as they can maintain the lowest technical standards of the contract, to be in contention and stay above the threshold of technical acceptability referred to in the contract. LPTA assists contractors in making their worst product/service offerings, reducing price and helping low quality firms to survive and remain above the technically acceptable threshold to compete. Though this method is used by the US government contracting office as its procurement strategy, the same is not applicable to HS contractors and suppliers, since the quality standards are required to be akin to military timelines and standards.

H5: Competitive outsourcing directly affects the effectiveness of the supply chain due to innovation-seeking outsourcing and lowest price tradeoff.

Effectiveness of Supply Chain

Conflict of interest

Fudenberg and Tirole (2000, p.1) state that firms are "poaching" current customers by planning exclusive offers to switch from their competitors. The paper also analyzes the duopoly market environment where poaching

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happens for both short-term and long-term contracts. Conditions are that consumers' preferences are constant from one period to the next and that they are independent of time.

The paper recommends that when consumers have fixed preferences, poaching could induce socially inefficient switching, so welfare to consumers is lowest and equilibrium with long-term contracts is preferable. Duopoly exists in the HS industry in the Asia Pacific region where the same phenomena are witnessed regularly. Therefore, from the HS contract perspective, long-term contracts could promote efficiency. Outsourcing by HS contractors for the service qualities expected by the US Navy is therefore a constant challenge under short-term weekly procurements, since each contractor will have induced some conflict of interest with the same suppliers of services on either quality or prices to wage a price war and win business. Effectiveness of the supply chain is lost due to these factors and, in lieu, conflict of interest is generated between high quality suppliers and HS contractors.

Supply chain flexibility

According to McCaughey (2004), greater supply chain integration promotion could be achieved by addressing the measurement of supply chain performance by customers, suppliers, and organizational integration. In doing so, the present and future challenges of managing supply chains could be addressed to develop measures that increase supply chain flexibility.

H6: Effectiveness of the supply chain directs impacts HS due to conflict of interest and supply chain flexibility.

Administrative Problems

In the five-year model of the contract, developing a long-term regional procurement framework with 20 to 30 leading high quality marine firms in the Asia Pacific region would take place over a period of 45 days, once in five years, as a one-time effort. Following completion of the project, the same procurement staff would then be transferred to oversee operations and monitor stringent US Navy quality metrics/performance timelines for the five year contract's lifecycle. However, with the MAC model, the same procurement is required to take place every week. Hence, the procurement staff cannot be effectively multi-tasking, thus increasing costs for suppliers. To be effective and to be in the winning game under the new contract vehicle, the number of personnel required to operate, monitor, and procure the same services has increased in each country, thereby adding financial and operational burden.

Resource increase

Fishman and Levy (2015) highlighted search cost as a type of transaction/switching cost. Companies strive to seek marginal benefit until their search costs are less than the total benefit achieved. In the case of the US Navy husbanding contract under the MAC environment, the marginal benefit is lower than the search costs, since competition is willing to go below market price to gain market share and provide services from low quality suppliers.

H7: Administrative problems positively impact the effectiveness of the supply chain due to staff increase and staff retention.

Staff retention

Hong and Shum (2006, p.261) present a detailed analysis of search costs for retail products. The paper concludes that in the equilibrium search framework, no price dispersion can arise for two reasons: (i) search costs are zero and prices represent the zero-profit equilibrium; (ii) search costs are prohibitively high, and the observed prices represent the equilibrium in which all firms charge the monopoly price.

Felicia Surugiu (2014) mention retention of seafarers as another important aspect for all shipping companies, including ship owners and ship managers. With more administrative problems, retention of experienced staff will be more complicated.

H8: Administrative problems positively impact quality in the long run due to staff increase and staff retention.

Quality in Long Run

He (2014) states that quality is a prerequisite for a sustainable supply chain. Reputable companies would like to avoid external failure, which results in higher expenses on quality and negative publicity. Hence, of the four

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quality categories (appraisal, prevention, internal failure, and external failure), only prevention can achieve high quality with low cost. For any new and complex product with an aggressive supply chain strategy, the impact of the supply chain strategy on the quality is not only limited to the product/services a company procures, but also related to its overall outsourcing and offshoring strategy.

Repeated cost cutting

Fishman and Levy (2015) indicate that high quality firms are more adversely affected than low quality firms by intensifying price competition. The paper analyzes how lower search costs affect firms' incentives to invest in quality. In the HS industry, management needs to be competitive and win; hence high quality firms are required to cut down and at the same time provide high quality services. Overall, the high quality is compromised due to repeated cost cutting and an inability to monitor quality appraisal and quality prevention factors.

Reduce quality failures

He (2014) states that in order to reduce service quality failures, it will not be possible to deploy personnel to various countries regionally/globally since the costs of undertaking such acts will significantly increase the costs of doing business in a supply chain. Hence businesses delegate a certain proportion of non-critical service components to high quality local suppliers and hand them complete control of the contract process to ensure quality failures are reduced and benefits are obtained in the long run.

H9: Quality in the long run directly impacts the performance of HS contractors in the MAC environment due to asset deterioration and repeated cost cutting measures.

3. QUESTIONS FOR RESEARCH

Objective of this research was to discover the basic transformation factors for businesses to survive due to uncertainty created in the industry due to implementation of the MAC in the Asia Pacific region.

3.0 Research Methodology

The research was conducted to collect the probable pain points and solutions to those factors due to the impact of MAC in the HS industry. The secondary data were collected from 20 research papers, leading to identification of the scope for future research on independent variables, explaining the impact of MACs on HS providers and the supply chain partners. The primary data were collected through an online questionnaire with a sample population consisting of senior managers, business owners, and the views of their key team members. These respondents have substantial knowledge of marine trading and the marine service industry. The following figure shows the research framework, indicating the relationship between dependent and independent variables**.**

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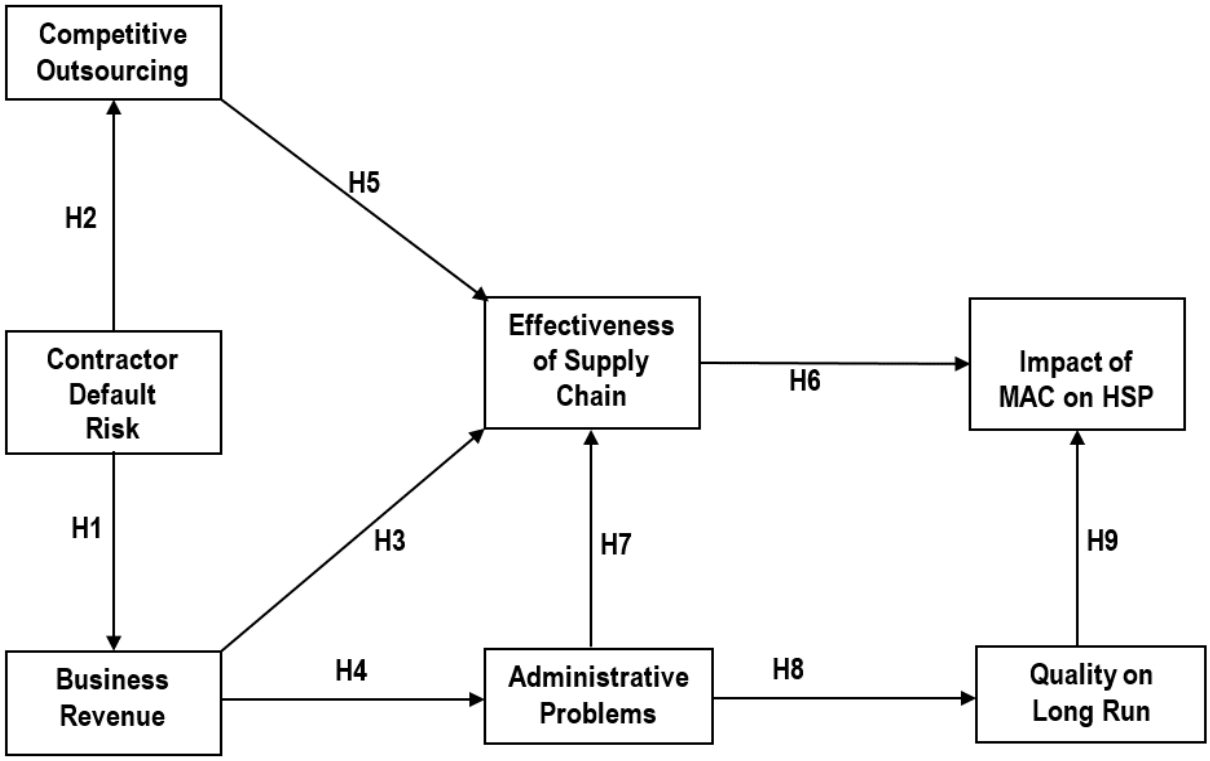

Figure 7

A questionnaire was designed based on industry sentiments and a review of literature. The relevant factors for each variable were incorporated into an online survey form. The survey participants were sectors of the marine industry who were directly/indirectly impacted by implementation of the MAC vehicle. Pre-testing of the questionnaire was carried out with 39 participants. A five-point Likert scale was used, with 1 indicating strong disagreement and 5 indicating strong agreement, to record responses. Pre-test questions were modified based on respondents' feedback. The final questionnaire consisted of 16 questions, the survey participants were professionals with a supply chain background from leading marine companies known to the MLS supply chain in the Asia Pacific region. The respondents were selected based on their knowledge and relative work continuum in shipping fields in the Asia Pacific region. A sample size of 300 potential respondents was approached; 192 survey responses were received, confirming a response rate of 64 per cent. Respondent demographics are listed in the table below.

Table 3. Respondents demographics in Asia Pacific region (n = 192)

Industry Sector	Frequency	Percentage
Marine Trader	**68**	35.30%
Marine Service Provider	**82**	42.50%
Port Authority	**9**	4.60%
Supply Chain Manager	**34**	17.60%

Industry Experience	Frequency	Percentage
Above 20 yrs	**64**	33.30%
Above 10 yrs	**72**	37.30%
Between 5 to 10 yrs	**56**	29.40%

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Software package ADANCO 1.1 was used to build a model. The model was built following a partial least squares (PLS) regression method. PLS is a type of bilinear factor model. Latent constructs and independent variable relationships were methodically analyzed using PLS.

4. DATA ANALYSIS

Structural equation modelling through a statistical approach was adopted for data analysis (Hoyle, 1995). Hypotheses were tested based on direct and indirect relationships observed in latent variables of the model.

Reliability Indicators

Cronbach's alpha estimates the reliability of a model. Hair et al. (2012) indicated that Cronbach's alpha is a value for a lower bound estimate gauging the reliability of a data set. If the value of $\alpha > 0.7$, it is considered acceptable. The minimum value is expected to be 0.7666. Wertz et al. (1974) state that if Jöreskog's rho is >0.8, this indicates good combined reliability of the model.

Table 4. Overall reliability: construct values

Construct	Dijkstra-Henseler's rho (ρA)	Jöreskog's rho (ρc)	Cronbach's alpha(α)
Impact of MAC on HSP	0.9673	0.976	0.9672
Quality on Long Run	0.9336	0.9678	0.9334
Administrative Problems	0.9415	0.9716	0.9415
Contractor Default Risk	0.9438	0.9726	0.9436
Business Revenue	0.9262	0.9644	0.9262
Effectiveness of Supply Chain	0.9367	0.9693	0.9367
Competitive Outsourcing	0.9247	0.9637	0.9247

Convergent Validity

Campbell and Fiske (1959) defined convergent validity as the relative measures of two constructs which are actually related when compared to their assumption figures. If the construct AVE value > 0.5, it confirms acceptability. Table 5 below shows the AVE values for all latent constructs are greater than 0.5, thereby proving excellent convergent validity.

Table 5. (AVE) values

Construct	Average variance extracted (AVE)
Impact of MAC on HSP	0.9104
Quality on Long Run	0.9375
Administrative Problems	0.9447
Contractor Default Risk	0.9466
Business Revenue	0.9313
Effectiveness of Supply Chain	0.9405
Competitive Outsourcing	0.9299

Discriminant Validity Indicators

Following Campbell and Fiske (1959), the degree of discrimination amongst latent constructs is measured using analysis software package ADANCO 1.1. The square root of AVE is expected to be greater in comparison to other variables.

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Table 6. Values for discriminant validity

Construct	Impact of MAC on HSP	Quality on Long Run	Administrative Problems	Contractor Default Risk	Business Revenue	Effectiveness of Supply Chain	Competitive Outsourcing
Impact of MAC on HSP	0.9104						
Quality on Long Run	0.8857	0.9375					
Administrative Problems	0.8834	0.8531	0.9447				
Contractor Default Risk	0.8572	0.8304	0.8868	0.9466			
Business Revenue	0.8622	0.8345	0.8482	0.8317	0.9313		
Effectiveness of Supply Chain	0.9065	0.8852	0.8803	0.8683	0.8753	0.9405	
Competitive Outsourcing	0.8792	0.8563	0.8557	0.8487	0.8585	0.8813	0.9299

Squared correlations; AVE in the diagonal.

Importance of Structural Equation Model

In structural equation modelling, single indicators are used for each variable. Wright (1934) stated that, in the causal model, the correlation equation is a summation of the individual contributions of all paths in the model where the variables are connected. The resultant value, being the product of the path coefficients measuring the path strength along each path, is called the R-squared value. The R-squared result of 0.924 significantly supports the model.

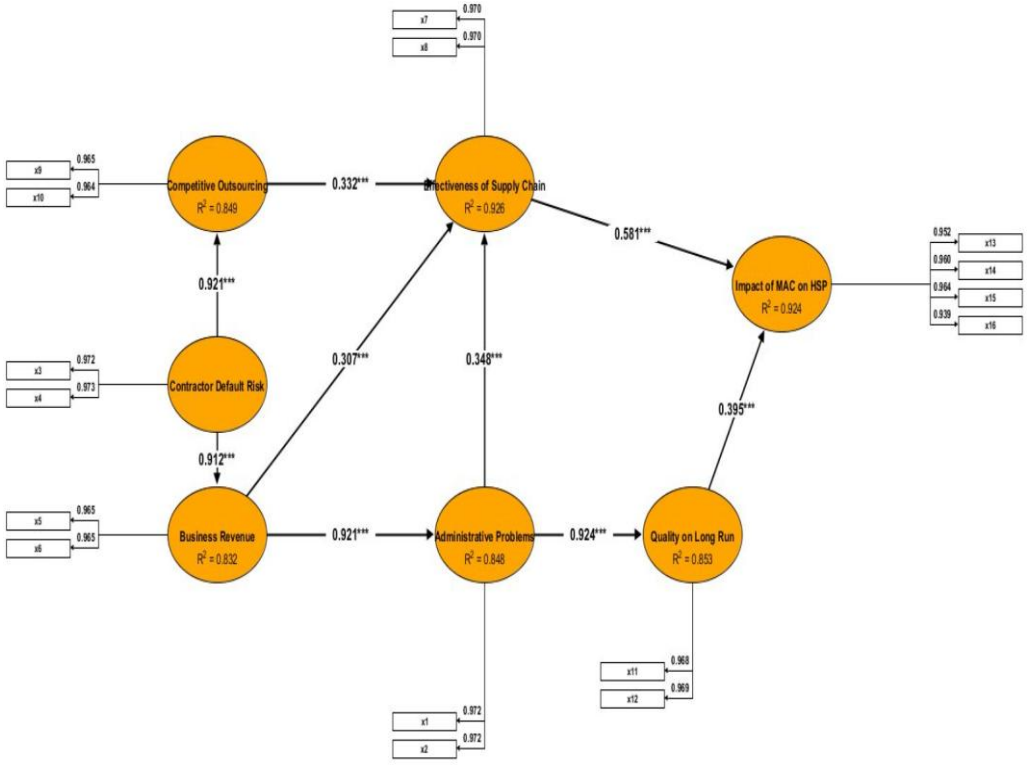

Figure 9. SEM indicating path coefficients and R-squared values

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Testing of Individual Hypotheses

Analysis software uses variance for structural equation modelling and to test hypotheses. Bootstrapping is considered the preferable method to model unknown population data. T-statistics are used to measure significance levels.

Table 10. Results of hypothesis testing

Hypothesis	Effect	Path coefficient	Standard bootstrap results			Supported
			Mean value	Standard error	t-value	
H1	Contractor Default Risk -> Business Revenue	0.9120	0.9119	0.0123	74.2417	YES
H2	Contractor Default Risk -> Competitive Outsourcing	0.9212	0.9209	0.0119	77.7282	YES
H3	Business Revenue -> Effectiveness of Supply Chain	0.3075	0.3121	0.0592	5.1902	YES
H4	Business Revenue -> Administrative Problems	0.9210	0.9210	0.0107	86.3212	YES
H5	Competitive Outsourcing -> Effectiveness of Supply Chain	0.3320	0.3306	0.0565	5.8745	YES
H6	Effectiveness of Supply Chain -> Impact of MAC on HSP	0.5806	0.5742	0.0688	8.4362	YES
H7	Administrative Problems -> Effectiveness of Supply Chain	0.3480	0.3446	0.0563	6.1808	YES
H9	Quality on Long Run -> Impact of MAC on HSP	0.3949	0.4015	0.0689	5.7305	YES
H8	Administrative Problems -> Quality on Long Run	0.9236	0.9236	0.0114	80.8608	YES

5. FINDINGS OF THE RESEARCH

All nine hypotheses have significantly strong path coefficients; hence all hypotheses are accepted. The first hypothesis, H1, addressed the influencing factor contractor default risk on business revenue of suppliers. Contractor default risk exhibits a strong impact (t-value = 74.24, CI > 99%); H1 ($\beta = 0.91$, $p < 0.01$) therefore meets the requisite limits. Hence, contractor default risks are directly related and affect suppliers' outsourcing strategies on the one hand. On the other hand, depending on the type of risk and country in which the supplier is positioned, contractor default risks could impact the business revenue of the suppliers. Hypothesis, H2, highlights the effect of contractor default risk on competitive outsourcing. The impact of contractor default risk is significant (t-value = 77.72, CI > 99%) for H2 ($\beta = 0.91$ and $p < 0.01$), meeting the requisite limits. According to Trkman and McCormack (2009), exogenous uncertainty is more difficult to prepare for and manage, and it may affect any portion of the supply chain. The results indicate that competitive outsourcing—a key function in the supply chain—is affected if exogenous risks are not managed effectively. Hypothesis, H3, tested the impact of business revenue on the effectiveness of the supply chain. The impact of business revenue is highly significant in enhancing effectiveness of supply chain (t-value = 5.19, CI > 95%) and H3 ($\beta = 0.30$, $p < 0.01$) meets the requisite limits. For Sweeney (2004), understanding of customer service sets the specification for supply chain design. The impact of low business revenue will lead to supply chain optimization and at times cause complete failures since several companies do not understand the US Navy scope, which in turn impacts the effectiveness of the supply chain.

The fourth hypothesis, H4, tested the effect of business revenue on administrative problems. The impact of interpersonal conflicts is again highly significant (t-value = 86.32, CI > 99%) and H4, $\beta = 0.42$, $p < 0.01$, is found to be very good. Yoshino and Taghizadeh Hesary (2016) highlight that geographical isolation puts SMEs in Asia at a competitive disadvantage. The USN husbanding contract in the MAC environment operates in several island states and markets in the Asia Pacific region, which is indeed isolated. The impact of MAC on SMEs with low cash fluidity directly affects their market penetration and revenues, leading to administrative

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problems. The fifth hypothesis, H5, experimented the impact of competitive outsourcing on effectiveness of supply chain. Results are highly significant (t-value = 5.87, CI > 99%) and H5 ($\beta = 0.33$, $p < 0.01$) meets requisite limits. Fudenberg and Tirole (2000) state that poaching of local suppliers induces a conflict of interest between various outsourcing companies. In the Asia Pacific region, competitive outsourcing therefore impacts the flexibility of the supply chain if competition poaches local suppliers under the MAC environment. That effectiveness is comparably reduced is highly probable with these results.

Hypothesis, H6, tested the effect of effectiveness of supply chain on the impact of MAC on HS. Once again, this impact was found to be highly significant (t-value = 8.43, CI > 99%), and H6 ($\beta = 0.58$, $p < 0.01$) meets the requisite limits. Gunasekaran et al. (2004) emphasize supply chain flexibility as a key factor for suppliers. However, in the duopoly market environment of the HS industry for every country in the Asia Pacific region, contractors and traders approach the same one or two reputable companies for outsourcing of marine assets and equipment, with the single objective to reduce prices.

Hypothesis, H7, tested the negative impact of administrative problems on the effectiveness of the supply chain. The impact of the composition of the team is found to be highly significant again (t-value = 6.18, CI > 99%) and H7 ($\beta = 0.34$, $p < 0.01$) meets the requisite limits (BIMCO/ISF, 2010). Caesar, Cahoon, and Fei (2013) state that the shortage of marine workforce persisted despite the global financial crisis and economic depression of the last decade. In addition, the volume of shipping fleet and trade has increased globally since 2000 to exacerbate the situation, increasing the demand for a marine workforce. The eighth hypothesis, H8, tested the impact of administrative problems on quality in long run. The results are once more highly significant (t-value = 5.73, CI > 99%), and H7 ($\beta = 0.92$, $p < 0.01$) is supported. Nguyen and Ghaderi (2014) state that staff retention will lead to untrained fresh mariners in the market. Effectively, fewer trained mariners in the HS industry will lead to a downturn in quality in the long run.

The ninth hypothesis, H9, addressed the effect of quality in the long run on the impact of MAC on HS. The effect of quality in the long run is once more highly significant (t-value = 80.86, CI > 99%) and H7 ($\beta = 0.39$, $p < 0.01$) is supported. All nine hypotheses have filled the research gap, supporting earlier findings.

6. RESEARCH CONTRIBUTIONS

Impact of Multiple Award Contract on Husbanding Service Provider

The MAC vehicle, due to the factors highlighted above, impacts suppliers in the Asia Pacific region. To deal with these impacts, this research proposes probable measures to remain sustainable and to survive the uncertainty created in the industry due to implementation of the MAC. Design optimal supply chain solutions specific to each country in the Asia Pacific region. Farahani, Rezapour, Drezner, and Fallah (2014) stated that a competitive supply chain network design (SCND) in different conditions is about recognizing competitive SCND and closed-loop supply chains. Continuous analysis of competition and predicting the resulting income is necessary for competitive closed-loop SCND. Translating this study to the service industry in the MAC environment would help in designing continuously innovative and design optimal networks which could surprise the competition every time.

Reduce inventory holding risk specifically on expensive marine assets. Moin and Salhi (2007) state that supply chain efficiency improvement is possible simply by shifting risk from one firm to another. In doing so, an organization can grow. Furthermore, supply chain coordination is possible without any division of the supply chain's profit if firms are willing to share the inventory risk via advance-purchase discounts. The aforementioned process is viable and an effective way to survive the impact of the MAC environment.

Reduce acquisition/procurement cycle time by increasing process automation. Hult (2002) mentions that entrepreneurship, innovativeness, and learning are key to sustainable competitive advantage. These factors could reduce the cycle time of the sourcing process and improve firms' overall business performance.

Work towards local supply chain collaboration and related stakeholder satisfaction. Maloni and Benton (1997) indicate that Asian firms have changed their outlook from a confrontational relationship to supply chain partnerships. A strategic alliance is formed between two independent successful entities for mutual benefit. This

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action has resulted in an increase in the financial and operational performance of each member by total costs, and inventory reductions throughout the supply chain. To survive the MAC environment, it is proposed to follow the recommendations of the author and make key strategic alliances in each country in the Asia Pacific region through sharing knowledge, technology, process improvement initiatives, and effective engagement at tactical, strategic and financial levels.

7. LIMITATIONS OF CURRENT RESEARCH

The primary research method used in this paper is a qualitative approach. In the Asia Pacific region, the multiple award contract model was implemented by the US Navy only late last year, in October 2016. Hence, there are insufficient data available related to the impact of MAC. Several suppliers from the HS industry in Asia agree that the MAC environment is exposing them to undue risks, but a more profound conclusion could be drawn once the US Navy's MAC vehicle has been implemented for more than five years so the sample size can be extended to obtain real time feedback beyond the supply chain of a single husbanding service provider.

Area for Future Research

McIvor (2008) states that unique an outsourcing strategy exists for every organization depending on its strengths, weaknesses, and capabilities. The efficiencies of outsourcing strategies, and their advantages and disadvantages, can only be analyzed once they have been implemented for some period of time. Implementation of the MAC environment in the Asia Pacific region for husbanding contracts is a very recent development. Due to budgetary, data, and time constraints, several factors could not be adequately addressed herein. Future research could therefore be extended to test and validate the current research with a bigger sample size and to consider empowerment of husbanding service providers in the MAC environment.

8. RESEARCH CONCLUSION

The results of all nine research hypotheses show high significance on the dependent variables, proving the impact of the multiple award contract vehicle on suppliers and regional HS contractors. The results received from 219 respondents have to some extent proved that the multiple award contract process induces an uncertainty amongst competing companies in an exogenous risk prone environment in the Asia Pacific region. The objective of this study was to understand the contractor default risks and impacts on supply chain effectiveness on a regional level, and their relative significance. Some factors to withstand the impacts of MAC on HS contractors have also been identified. The research provides a fresh perspective on influencing factors such as effectiveness of supply chain, business revenue, administrative problems, competitive outsourcing, and quality in the long run, and their impacts on HS in the MAC environment.

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