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3RD-5TH SEPTEMBER

ASTON UNIVERSITY BIRMINGHAM UNITED KINGDOM

This paper is from the BAM2019 Conference Proceedings

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**Capturing Managerial Cognition and Investigating the Impact of Scenario Planning on
the Shipping Industry Stakeholders**

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Capturing Managerial Cognition and Investigating the Impact of Scenario Planning in the Shipping Industry

Summary

This paper outlines the research aims and some initial findings from two systematic literature reviews that were recently conducted by the author. Starting with the question ‘how do managers think about the future?’, this paper engages in a conversation framed within the context of corporate foresight on how stakeholders in the shipping industry engage with it in turbulent times. Deriving from the findings of reviews of literature, it sets out the evolution of the application of the scenario technique in the shipping industry as well as the technique’s impact on participants’ thinking. The paper further describes the proposed research design to attempt to answer the proposed research.

Word Count: 1971 (excluding tables and references)

Keywords: scenario technique, managerial cognition, the maritime shipping industry

1. Introduction

Shipping is an essential mode of transport in the world (Duru et al., 2011) and it plays a key role in the global economy (Stopford, 2009). Although forecasting is of crucial importance for every industry (Goulielmos and Psifia, 2009), the capital-intensive (Omrani and Keshavarz, 2015) and cyclical nature of the shipping industry (Chen et al., 2012, Chistè and van Vuuren, 2014, Nielsen et al., 2014) require a successful future decision-making ability and make it even more crucial for anyone who wants to stay in the business. However, there is one big obstacle that stands between the success and the ship owners, that is the need for accurately seeing the future. The shipping industry is forecasting driven for many purposes, for instance, predicting spot and time-charter rates, government policy-making, and strategic and corporate planning (Stopford, 2009), even though forecasting is perceived as “*not worthwhile beyond the shortest of period*” (Drucker, 1988) and it is infamous for failing quite often in the shipping industry (Gomez Paz et al., 2014, Goulielmos and Psifia, 2011, Nielsen et al., 2014, Qingcheng et al., 2015, Stopford, 2009).

The aim of this proposed study is to start with the question ‘how do managers think about the future?’ and further engage in a conversation framed within the context of corporate foresight on how stakeholders in the shipping industry engage with it. Scenario planning, which is a prominent corporate foresight tool (Rohrbeck et al., 2015), was chosen to put under scrutiny by the authors in terms of its applications in the shipping industry and the technique’s effectiveness on participants. By doing so, this paper contributes to the scenario planning literature in two ways, it provides insights into the technique’s use in the shipping business and contributes to the theory of scenario planning.

The research questions are as follows;

1. How do ship owners do foresight and make sense of the future?
2. What is the impact of presenting the future shipping scenarios on the industry stakeholders' thinking?

In order to answer the first research question, dividing it into two sub questions has been decided to be the best approach. Accordingly, the question 1.1. aims to understand the strategy makers’ foresight process. The question 1.2. looks into their future anticipations and forecasts.

2. Research Design

This paper has been developed based on potential research questions and systematic reviews of literature in the field of inquiry. Due to the scarcity of research on managerial cognition in the maritime shipping business, this phenomenon is planned to be investigated in the empirical part of this research. On the other hand, two systematic literature reviews that were conducted between June 2018 and December 2018 have functioned as structuring the backbone of this paper. Both reviews were conducted by following the suggestions made by Tranfield et al. (2003) and Thorpe et al. (2005).

In the first part of this research project, the questions 1.1. asks the question ‘how do ship owners foresight and make sense of the future’. The same question was recently attempted to be answered by Tapinos and Pyper (2018). They employed a practise lens and focused on the micro level practise, and analysed the interview data by coding and interpretation based on the recommendations given by Gioia and Chittipeddi (1991). Thus, this research is an expansion on that research in terms of number of cases that are going to be built. In their research they used single case study methodology and investigated and a single IT consultant company. Another difference in this research is the industry in which the research will be applied on.

However, as mentioned earlier, the authors also aim to gather expert knowledge and conduct a Delphi survey to investigate the ship owners’ future perception and vision. Although this part of the research could be a Delphi forecast including expert stakeholders from a wider range of sub-maritime industries, the research question does not aim to forecast the future of a specific shipping industry but the shipowner’s and ship owning company strategy managers’ future visions. Due to this reason, rather than doing a study similar to Ariel (1989), and including different stakeholders, which was suggested by Duru et al. (2013), the authors will limit the sample inclusion criteria based on the research aim. What is still unclear is the sub-industry this research will focus on. This is still uncertain due to data availability uncertainty. Traditionally, bulk shipping is a market that is comprised of companies that own two or three to dozens of bulk cargo vessel owners. Another potential industry that can be chosen, the container shipping, is predominantly made up by multinational companies. It is hard to successfully anticipate whether the smaller companies or the bigger companies would be more willing to take part in such research. The initial contacts with some container shipping company strategic planning managers appear to be positive and there is a promising degree of interest to this research. However, it is still early to decide and propose what exact sub industry the research focus will be on.

The second main research question aims to measure the impact of scenario planning on the stakeholders in the shipping. To do that, the first author conducted a systematic literature review and evaluated the future scenarios developed for industry and further conducted a meta-analysis (see table 1). The resulting meta-shipping scenarios will be used in this research. Thus, unlike most research conducted in the last few years, the participants will not actually develop but be presented with the meta- scenarios.

3. Reviews of the Literature

3.1.Scenarios for the shipping industry

The review has revealed that the earliest use of scenario technique in shipping was in 2005. Although its popularity did not gain pace until 2013, before the 2009 economic crisis, scenario-based studies in marine transport research were almost non-existent. One explanation for that might be due to the shipping market’s unpredictability. Researchers and practitioners in the field started to turn to scenario planning and scenario-based research in the last years, after the sudden unexpected and crushing impact of the economic crisis on the shipping industry. The declining trend of scenario-based studies in shipping could be due to theoretical saturation. As will be mentioned in detail, most shipping scenarios were aimed for the development of the next 20 to 30 years and most scenarios pointed out similar futures.

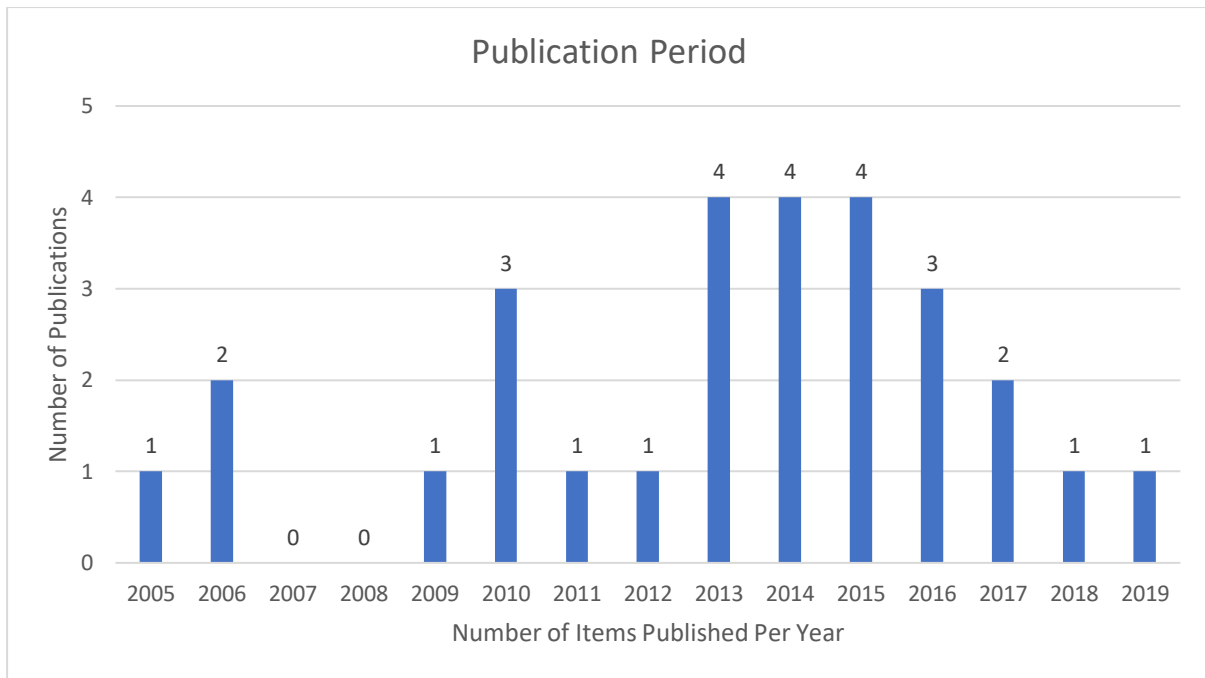


Chart 1: Publication period

The review found that eighteen studies aimed at developing future scenarios for the shipping and logistics industry (see Chart 2 below). Six out of eighteen studies focused on the future of global shipping whereas the same number of publications covered Europe exclusively or some parts of Europe. Due to the growing concerns regarding global warming and emissions generated by ships as a contributing factor, they were manifested in another research stream. This stream which investigated the future of maritime shipping and the Arctic region was consisted of three studies. Other three scenario studies focused on the USA, China-Pakistan transport corridor, and Indonesia.

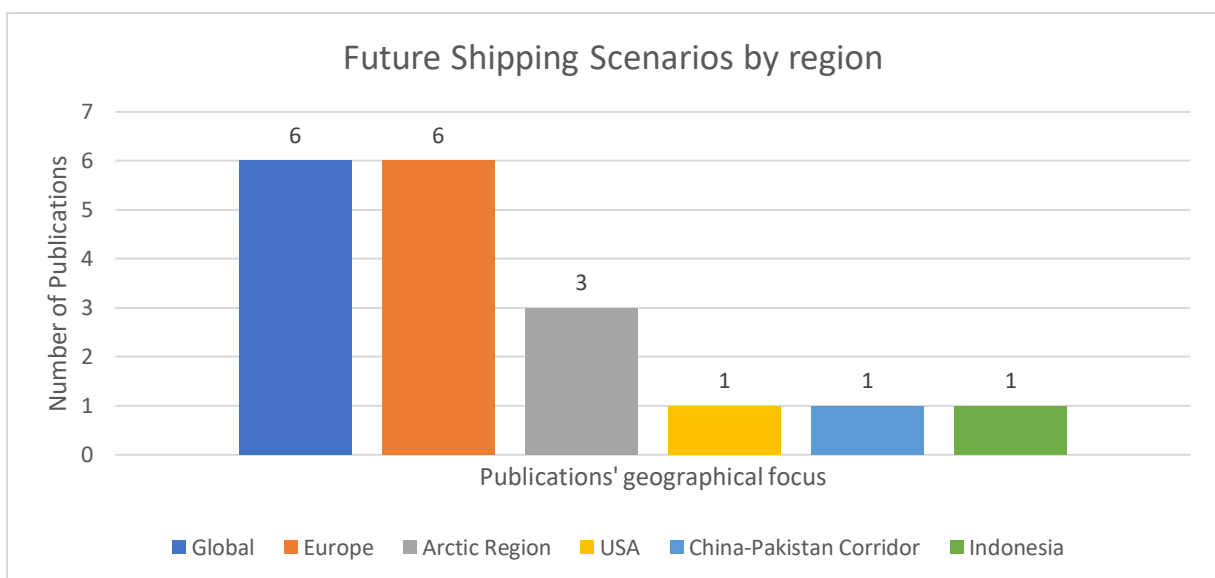


Chart 2: Geographical Distribution of Shipping Scenarios

Most studies in the review utilised key drivers and key uncertainties before scenario development. Global economics was chosen in sixteen studies as a key driver and five of which later considered it as part of key uncertainties and further was considered during scenario building (see Chart 3). This was not a surprise since shipping in a demand-derived business (Stopford, 2009) and affected by any changes in the global economy. Technology and resources were, followed global economics, the second and the third mostly evaluated key drivers, respectively. Technology plays an important role in shipping from design to construction, fuel types in use to efficient and capable engines. However, it was chosen as a key uncertainty in only one study, and the rest considered technology as an element helped them to build the scenario narratives. The 90% of the world trade is shipped by seaborne transport (International Chamber of Shipping, 2018) meaning that the resources have been predominantly distributed across the globe by shipping and this relationship seems to be reflected in scenario studies and in three studies it was chosen as a critical uncertainty. Environment and politics, each accounted for a major part of key drivers in reviewed publications after technology and resource. Lastly, social dynamics and fuel prices were other elements considered in scenario studies. Other various key drivers were as follows, speed, traffic, changes to transport modes, ship size changes, containerisation and safety.

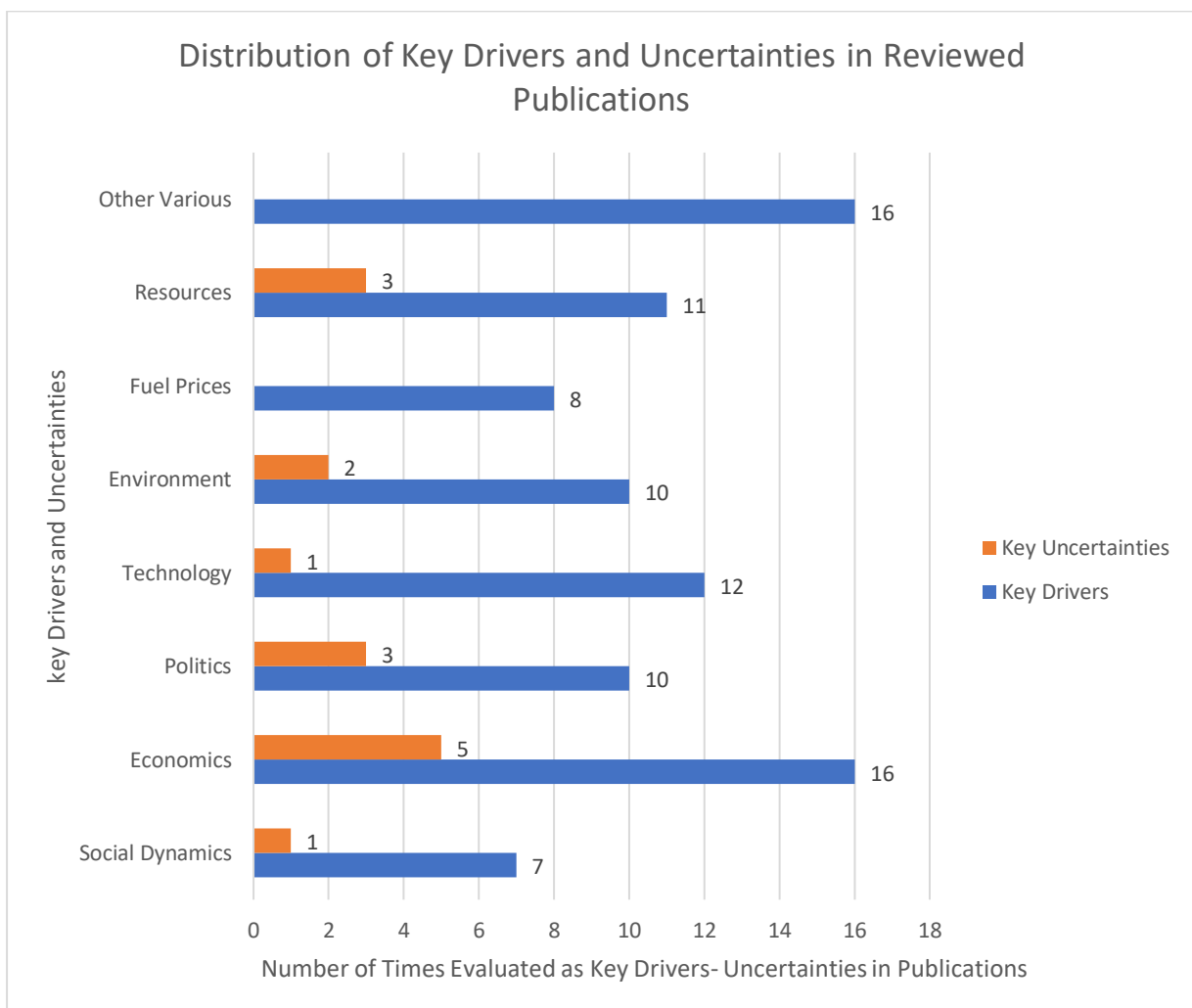


Chart 3: Common Key Drivers and Uncertainties in Reviewed Publications

3.1.1. The Future of the Shipping Industry by Scenarios

The analysis has revealed that the future of the shipping industry has been envisaged mostly in a set of three to four scenarios. Most of these studies were published between 2010 and 2015 (see Figure below), and around half of them included a business-as-usual scenario. Those BAU scenarios allowed the author to control the structure of scenario mapping. Having analysed the key uncertainties that the scenarios were based on; the left-hand side of the map was assigned to the scenarios in which free trade and the improved economy were the main characteristics. The right-hand side of the map is based on the scenarios which were characterised by slow economic growth and de-globalisation. The scenarios positioned on the leftmost that indicate a future that is consumption driven and unconcerned with environmental issues. On the contrary, the rightmost side represents a de-globalised world where economic growth is sluggish, and the environmental issues are negligible.

Having decided on the main structure of scenario mapping, the author positioned the BAU scenarios in a theme order. The themes were as follows,

- Global Shipping Scenarios
- Regional Shipping Scenarios
- Shipping Emissions Scenarios including the Arctic Region.

As illustrated in the scenario map, the global commons scenario of Global Marine trends study falls between the pursued growth and sustainable growth scenarios of the E.U. study and, in the same way, the Status quo scenario falls between sustainable growth and fragile recovery, and the competing nations scenario between fragile recovery and boom and bust.

3.2.The Impact of Scenario Planning Literature

The systematic review of the literature on the effectiveness of scenario planning on participants gathered nineteen peer-reviewed publications. The earliest publication in the field was published in 1987 by Schnaars and Topol (1987) but the highest number of publications were made in 2012 with six studies. (see Chart 4).

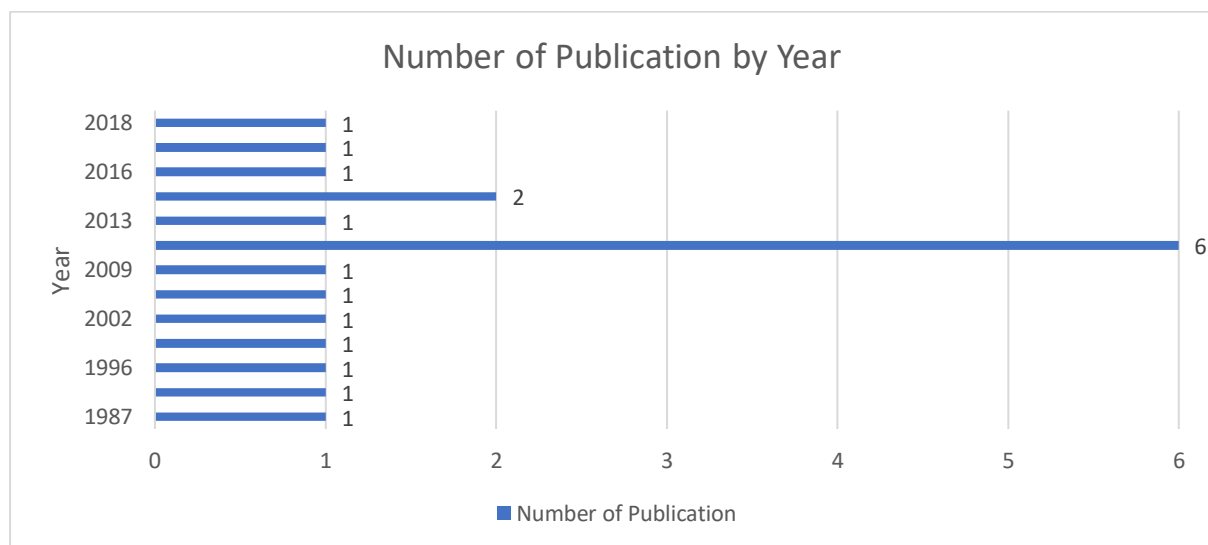


Chart 4: The Impact of Scenario Planning Literature by Years

Themes	Author	Scenarios			
		Global – Fast Economic Growth		Deglobalised – Slow Economic Growth	
Emissions – Fuels	Smith et al. (2014b)	Global Commons	Status Quo	Competing Nations	
	Lloyd’s Register and UMAS (2017)	Green Electricity	Green Ammonia	Green Hydrogen	
	Lloyd’s Register (2016) ¹	High-offsetting	High Bio	High Hydrogen (based on RCP 2.6)	BAU
Shipping Emissions incl. Arctic	Smith et al. (2014a)	SS5 – RCP 8.5 – Fuel Mix – Efficiency improvement	SS1 – RCP 6.0 – Fuel Mix – Efficiency improvement	SS4 – RCP 2.6 – Fuel Mix – Efficiency improvement	SS3 – RCP 4.5 – Fuel Mix – Efficiency improvement
	Eyring et al. (2005)	DS4	DS3	DS2	DS1
	Dalsøren et al. (2013)	In-Arctic high-growth impact	In-Arctic BAU		

¹ The current positioning of this set of scenarios is highly loose and will be subject to further analysis.

	Corbett et al. (2010)	In-Arctic high-growth	In-Arctic BAU			
	Arctic Council (2009)	Arctic Race	Arctic Saga	Polar Preserve	Polar Lows	
Regional Shipping Scenarios (Excluding the Arctic Region)	Kovacic et al. (2015)	No-constraints Scenario	Intensive Development	Sustainable Development	Special-interest Tourism	
	Zulfitri et al. (2015)	Conventional Marine Tourism	Advanced marine Ecotourism	Pre-Advanced Marine Ecotourism	Under-developed Marine Ecotourism	
	Ministry of Transport New Zealand and Deloitte Touche Tohmatsu (2014)	Single Hub & Spoke	Hub & Spoke	Partial Hub & Spoke	Emerging Trends	Status Quo
	Hamburgisches WeltWirtschafts Institut and Berenber Bank (2006)	E.U. Ports High Scenarios	E.U. ports BAU Scenario			
	European Commission DG Mobility and Transport (2015)	SSS High Scenarios	SSS Baseline Scenario	SSS Low Scenario		
	Storgård et al. (2012)	Model Region for Safe Shipping	BAU in the Baltic Sea	Major Disasters in the Baltic Sea		

	Chris Caplice and Shardul Phadnis (2013)	Global Marketplace	One World Order	Naftastique!	Millions of Markets
	Wolters et al. (2013)	Pursued Growth	Sustainable Growth	Fragile Recovery	Boom & Bust
Global Maritime Shipping Scenarios	Fang et al. (2013)		Global Commons	Status Quo	Competing Nations
	Wärtsilä Corporation (2010)		Open Oceans	Yellow River	Rough Seas
Global Transport Scenarios	World Energy Council (2011)		Freeway		Tollway
Global Logistics – SCM	Ruske et al. (2010)	The Careless and Globalised World	The Eco-aware, but tempted world	The Restricted, but still ignorant world	The deglobalised and Clean World

Figure 1: Scenario Map

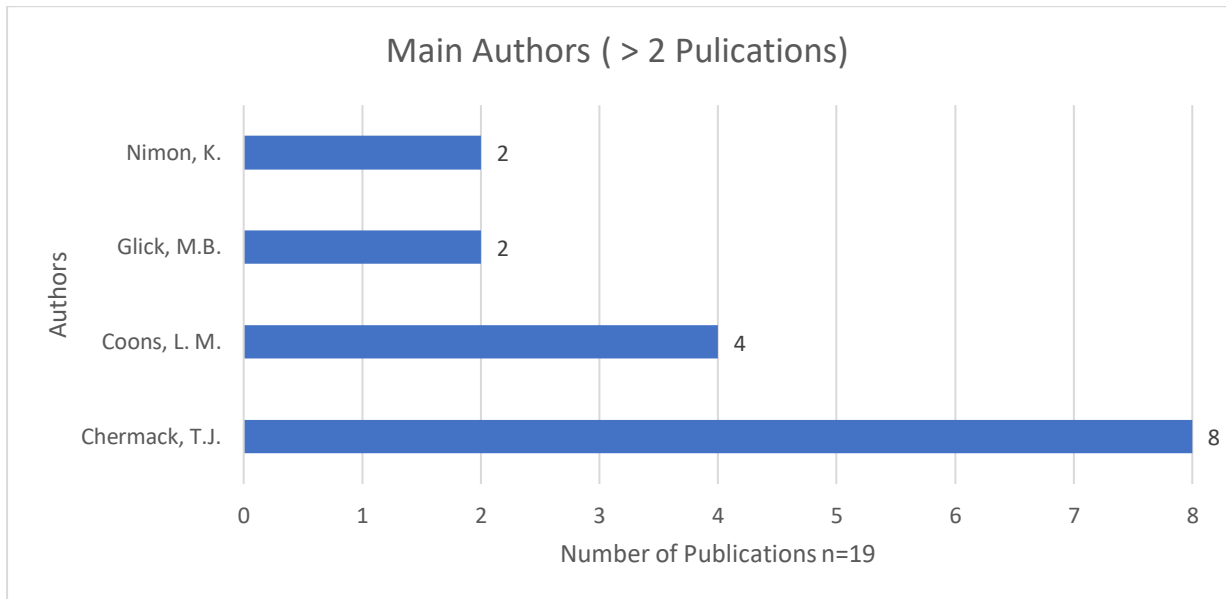


Chart 5: The Impact of Scenario Planning Literature by Author

The most notable author was Chermack with eight publications (see Chart 5) (Chermack and Nimon, 2008, Glick et al., 2012, Chermack et al., 2015, Marquitz et al., 2016, Haeffner et al., 2012, Chermack et al., 2017, Veliquette et al., 2012, Visser and Chermack, 2009).

3.2.1. Scenario Planning Effectiveness Empirical Findings

Similar to Balarezo and Nielsen (2017), the author’s systematic review on the scenario effectiveness literature generated the following impact areas, ‘learning’, ‘thinking’, ‘cognitive biases’, ‘judgement, belief, decision making’ and ‘performance’ (see table 1). Although the findings of the studies in the review are preliminary and each impact area requires further research, there seem to be positive outcomes of scenario planning.

Authors	Impact on	Findings
Totin et al. (2018), Haeffner et al. (2012), Johnson et al. (2012)	Learning	Reportedly, during scenario workshops, learning is encouraged, and group learning in the forms of “learning from others”, “knowledge building”, and increased knowledge occurred
Totin et al. (2018), Phadnis et al. (2015), Chermack et al. (2015), Haeffner et al. (2012), Johnson et al. (2012)	Thinking	Analysis on workshop participant statements have revealed an enhanced understanding of others’ perspectives and increased systematic and flexible thinking. Mental models of participants changed after taking part in scenario workshops.

Kuhn and Sniezek (1996), Meissner and Wulf (2013), Min and Arkes (2012), Schomaker (1993), Sedor (2002)	Cognitive Biases	The application of scenarios suggest a reduction on the framing bias (Torsten Wulf et al., 2013) and optimistic prediction bias (Min and Arkes, 2012).
Chermack and Nimon (2008), Min and Arkes (2012), Phadnis et al. (2015), Schomaker (1993), Sedor (2002)	Judgement, belief, decision making	<p>Higher impact on subjects' judgements who received scenarios than the ones who developed (Schomaker, 1993). Another study where subjects received two scenarios depicted less change in their decisions than who received only one (Kuhn and Sniezek, 1996). Another research, where participants developed scenarios, has looked into the application of single and multiple scenarios and the majority of subjects' judgement changed after scenario evaluation after both single and multiple scenarios at similar rates (Phadnis et al., 2015).</p> <p>Regarding the impact of scenario content, when scenarios were presented to participants, some forecast variables seemed to be more likely to shift participant answers on a topic provided (Kuhn and Sniezek, 1996). On this matter, however, Sedor (2002) argued that the differences did not arise from content but the scenario information structure. Joining in the discussion, more insight has come from another research suggesting that rather than content, participants' interpretation of the process, the feeling of ease in their study, is the significant factor (Min and Arkes, 2012).</p>
Phelps et al. (2001), Visser and Chermack (2009)	Performance	Preliminary evidence for organisational and financial performance increase.

Table 1: Empirical Evidence on Scenario Planning Effectiveness

REFERENCES

- ARIEL, A. 1989. Delphi forecast of the dry bulk shipping industry in the year 2000. *Maritime Policy & Management*, 16, 305-336.
- BALAREZO, J. & NIELSEN, B. B. 2017. Scenario planning as organizational intervention: An integrative framework and future research directions. *Review of International Business and Strategy*, 27, 2-52.
- CHEN, S., MEERSMAN, H. & VOORDE, E. 2012. Forecasting spot rates at main routes in the dry bulk market. *Maritime Economics & Logistics*, 14, 498-537.
- CHERMACK, T. J., COONS, L. M., NIMON, K., BRADLEY, P. & GLICK, M. B. 2015. The Effects of Scenario Planning on Participant Perceptions of Creative Organizational Climate. *Journal of Leadership & Organizational Studies*, 22, 355-371.
- CHERMACK, T. J., COONS, L. M., O'BARR, G. & KHATAMI, S. 2017. The Effects of Scenario Planning on Participant Reports of Resilience. *European Journal of Training and Development*, 41, 306-326.
- CHERMACK, T. J. & NIMON, K. 2008. The effects of scenario planning on participant decision-making style. *Human Resource Development Quarterly*, 19, 351-372.
- CHISTÈ, C. & VAN VUUREN, G. 2014. Investigating the cyclical behaviour of the dry bulk shipping market. *Maritime Policy and Management*, 41, 1.
- CHRIS CAPLICE & SHARDUL PHADNIS 2013. Strategic Issues Facing Transportation, Volume 1: Scenario Planning for Freight Transportation Infrastructure Investment.
- CORBETT, J. J., LACK, D. A., WINEBRAKE, J. J., HARDER, S., SILBERMAN, J. A. & GOLD, M. 2010. Arctic shipping emissions inventories and future scenarios. *Atmos. Chem. Phys.*, 10, 9689-9704.
- DALSØREN, S. B., SAMSET, B. H., MYHRE, G., CORBETT, J. J., MINJARES, R., LACK, D. & FUGLESTVEDT, J. S. 2013. Environmental impacts of shipping in 2030 with a particular focus on the Arctic region. *Atmospheric Chemistry and Physics*, 13, 1941.
- DRUCKER, P. F. 1988. *Management*, Oxford, Oxford : Butterworth Heinemann.
- DURU, O., BULUT, E. & YOSHIDA, S. 2011. A fuzzy extended DELPHI method for adjustment of statistical time series prediction: An empirical study on dry bulk freight market case. *Expert Systems With Applications*.
- DURU, O., BULUT, E. & YOSHIDA, S. 2013. Delphi forecasting for shipping industry and technology: Performance and validity. Available at SSRN 2239723.
- EUROPEAN COMMISSION DG MOBILITY AND TRANSPORT 2015. Analysis of Recent Trends in EU Shipping and Analysis and Policy Support to Improve the Competitiveness of Short Sea Shipping in the EU.
- EYRING, V., KÖHLER, H. W., LAUER, A. & LEMPER, B. 2005. Emissions from international shipping: 2. Impact of future technologies on scenarios until 2050. *Journal of Geophysical Research: Atmospheres*, 110.
- FANG, I., CHENG, F., INCECIK, A. & CARNIE, P. 2013. Global Marine Trends 2030.
- GIOIA, D. A. & CHITTIPEDDI, K. 1991. Sensemaking and sensegiving in strategic change initiation. *Strategic Management Journal*, 12, 433-448.
- GLICK, M. B., CHERMACK, T. J., LUCKEL, H. & GAUCK, B. Q. 2012. Effects of Scenario Planning on Participant Mental Models. *European Journal of Training and Development*, 36, 488-507.
- GOMEZ PAZ, M. A., CAMARERO ORIVE, A. & GONZÁLEZ CANCELAS, N. 2014. Use of the Delphi method to determine the constraints that affect the future size of large container ships. *Maritime Policy & Management*, 1-15.

- GOULIELMOS, A. & PSIFIA, M.-E. 2009. Forecasting weekly freight rates for one-year time charter 65 000 dwt bulk carrier, 1989-2008, using nonlinear methods. *Maritime Policy and Management*, 36, 411-436.
- GOULIELMOS, A. & PSIFIA, M.-E. 2011. Forecasting short-term freight rate cycles: do we have a more appropriate method than a normal distribution? *Maritime Policy and Management*, 38, 645.
- HAEFFNER, M., LEONE, D., COONS, L. & CHERMACK, T. 2012. The Effects of Scenario Planning on Participant Perceptions of Learning Organization Characteristics. *Human Resource Development Quarterly*, 23, 519-542.
- HAMBURGISCHES WELTWIRTSCHAFTS INSTITUT & BERENBER BANK 2006. Maritime Trade and Transport Logistics Strategy 2030.
- INTERNATIONAL CHAMBER OF SHIPPING. 2018. *Shipping and World Trade* [Online]. Available: <http://www.ics-shipping.org/shipping-facts/shipping-and-world-trade> [Accessed 24.02.2019].
- JOHNSON, K., DANA, G., JORDAN, N., DRAEGER, K., KAPUSCINSKI, A., OLABISI, L. & REICH, P. 2012. Using Participatory Scenarios to Stimulate Social Learning for Collaborative Sustainable Development. *Ecology and Society*, 17, 1.
- KOUFOPOULOS, D. N., LAGOUDIS, I. N. & PASTRA, A. 2005. Planning practices in the Greek ocean shipping industry. *European Business Review*, 17, 151-176.
- KOVACIC, M., GRACAN, D. & JUGOVIC, A. 2015. The scenario method of nautical tourism development - a case study of Croatia. *Pomorstvo-Scientific Journal of Maritime Research*, 29, 125-132.
- KUHN, K. M. & SNIEZEK, J. A. 1996. Confidence and Uncertainty in Judgmental Forecasting: Differential Effects of Scenario Presentation. *Journal of Behavioral Decision Making*, 9, 231-247.
- LLOYD'S REGISTER 2016. Low carbon pathways 2050.
- LLOYD'S REGISTER AND UMAS 2017. Zero-Emission Vessels 2030. How do we get there?
- MARQUITZ, M., BADDING, S. & CHERMACK, T. J. 2016. The effects of scenario planning on participant perceptions of grief in organisational change. *International Journal of Technology Intelligence and Planning*, 11, 1-19.
- MEISSNER, P. & WULF, T. 2013. Cognitive benefits of scenario planning: Its impact on biases and decision quality. *Technological Forecasting and Social Change*, 80, 801.
- MIN, K. S. & ARKES, H. R. 2012. When Is Difficult Planning Good Planning? The Effects of Scenario-Based Planning on Optimistic Prediction Bias. *Journal of Applied Social Psychology*, 42, 2701-2729.
- MINISTRY OF TRANSPORT NEW ZEALAND & DELOITTE TOUCHE TOHMATSU 2014. Future Freight Scenarios Study.
- NIELSEN, P., JIANG, L., RYTTER, N. G. M. & CHEN, G. 2014. An investigation of forecast horizon and observation fit's influence on an econometric rate forecast model in the liner shipping industry. *Maritime Policy & Management*, 41, 667-682.
- OMRANI, H. & KESHAVARZ, M. 2015. A performance evaluation model for supply chain of shipping company in Iran: an application of the relational network DEA. *Maritime Policy & Management*, 1-15.
- PHADNIS, S., CAPLICE, C., SHEFFI, Y. & SINGH, M. 2015. Effect of scenario planning on field experts' judgment of long-range investment decisions. *Strategic Management Journal*, 36, 1401-1411.
- PHELPS, R., CHAN, C. & KAPSALIS, S. C. 2001. Does scenario planning effect performance? Two exploratory studies. *Journal of Business Research*, 51, 223-232.

- QINGCHENG, Z., CHENRUI, Q., ADOLF, K. Y. N. & XIAOFENG, Z. 2015. A new approach for Baltic Dry Index forecasting based on empirical mode decomposition and neural networks. *Maritime Economics & Logistics*.
- ROHRBECK, R., BATTISTELLA, C. & HUIZINGH, E. 2015. Corporate foresight: An emerging field with a rich tradition. *Technological Forecasting and Social Change*, 101, 1-9.
- RUSKE, K., KAUSCHKE, P., REUTER, J., MONTGOMERY, E., VON DER GRACHT, H., GNATZY, T. & DARKOW, I. 2010. Transportation & Logistics 2030 Volume 1: How will supply chains evolve in an energy-constrained, low-carbon world? *PriceWaterhouseCoopers, Germany*.
- SCHNAARS, S. P. & TOPOL, M. T. 1987. The use of multiple scenarios in sales forecasting: An empirical test. *International Journal of Forecasting*, 3, 405-419.
- SCHOMAKER, P. J. H. 1993. MULTIPLE SCENARIO DEVELOPMENT: ITS CONCEPTUAL AND BEHAVIORAL FOUNDATION. *Strategic Management Journal*, 14, 193-213.
- SEDDOR, L. M. 2002. An Explanation for Unintentional Optimism in Analysts' Earnings Forecasts. *The Accounting Review*, 77, 731-753.
- SMITH, T., JALKANEN, J., ANDERSON, B., CORBETT, J., FABER, J., HANAYAMA, S., O'KEEFFE, E., PARKER, S., JOHANSSON, L. & ALDOUS, L. 2014a. Third imo ghg study 2014. In: (IMO), I. M. O. (ed.). London.
- SMITH, T., RAUCCI, C., SABIO, N. & ARGYROS, D. 2014b. Global Marine Fuel Trends 2030.
- STOPFORD, M. 2009. *Maritime economics*, London, London : Routledge.
- STORGÅRD, J., LAPPALAINEN, J., WAHLSTRÖM, I. & KAJANDER, S. 2012. Scenarios for the Development of Maritime Safety and Security in the Baltic Sea Region. Centre for Maritime Studies, University of Turku.
- TAPINOS, E. & PYPER, N. 2018. Forward looking analysis: Investigating how individuals 'do' foresight and make sense of the future. *Technological Forecasting and Social Change*, 126, 292-302.
- THORPE, R., HOLT, R., MACPHERSON, A. & PITTAWAY, L. 2005. Using knowledge within small and medium-sized firms: A systematic review of the evidence. *International Journal of Management Reviews*, 7, 257-281.
- TORSTEN WULF, PHILIP MEISSNER, CHRISTIAN BRANDS & STUBNER, S. 2013. Scenario-based strategic planning: A new approach to coping with uncertainty. In: SCHWENKER, B. & WULF, T. (eds.) *Scenario-based strategic planning : developing strategies in an uncertain world*. Wiesbaden : Springer Gabler.
- TOTIN, E., BUTLER, J. R., SIDIBÉ, A., PARTEY, S., THORNTON, P. K. & TABO, R. 2018. Can scenario planning catalyse transformational change? Evaluating a climate change policy case study in Mali. *Futures*, 96, 44-56.
- TRANFIELD, D., DENYER, D. & SMART, P. 2003. Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review. *British Journal of Management*, 14, 207-222.
- VELIQUETTE, A. J., COONS, L. M., MACE, S. L., COATES, T., CHERMACK, T. J. & SONG, J. H. 2012. The effects of scenario planning on perceptions of conversation quality and engagement. *International Journal of Technology Intelligence and Planning*, 8, 254-277.
- VISSER, M. P. & CHERMACK, T. J. 2009. Perceptions of the relationship between scenario planning and firm performance: A qualitative study. *Futures*, 41, 581.
- WÄRTSILÄ CORPORATION 2010. Shipping scenarios 2030.

- WOLTERS, H. A., GILLE, J., DE VET, J. M. & MOLEMAKER, R. J. 2013. Scenarios for selected maritime economic functions. *European Journal of Futures Research*, 1, 11.
- WORLD ENERGY COUNCIL 2011. Global Transport Scenarios 2050.
- ZULFITRI, S. M., KHAIRUL MULUK, M. R. & HERMAWAN 2015. Scenario Planning for the Development of Maritime Eco-tourism Object. *Bisnis & Birokrasi*, 22, 88-99.