

2016

# Maritime Economics in a Post-Expansion Panama Canal Era

Grace W. Y. Wang

Wayne Talley

*Old Dominion University*, wktalley@odu.edu

Mary R. Brooks

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## Repository Citation

Wang, Grace W. Y.; Talley, Wayne; and Brooks, Mary R., "Maritime Economics in a Post-Expansion Panama Canal Era" (2016). *Economics Faculty Publications*. 39.  
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## Original Publication Citation

Wang, G. W. Y., Talley, W., & Brooks, M. R. (2016). Maritime economics in a post-expansion Panama Canal era. *Maritime Policy & Management*, 43(2), 161-163. doi:10.1080/03088839.2016.1133160

## EDITORIAL

# Maritime economics in a Post-Expansion Panama Canal Era

The 2016 opening of an expanded Panama Canal will allow for Post-Panamax container-ships up to 12 500 twenty-foot equivalent unit (TEU) in size to transit the Panama Canal. In response, some US East Coast container ports are having their channels and berths dredged deeper—to allow Post-Panamax container-ships from Asia (transiting the expanded canal) to call at their ports. What are the implications for the US West Coast ports? Will there be a cargo shift from West Coast to East Coast ports? These topics as well as the impacts of other changes in global shipping lanes (e.g., the Suez Canal and the Arctic shipping lanes) on global trade and ports in the Post-Expansion Panama Canal Era were discussed in various sessions of the International Association of Maritime Economists (IAME) 2014 Conference. This special issue is dedicated to the study of the above impacts. The goal of this special issue is to encourage research in this important area by highlighting the influence of the Panama Canal expansion to the global maritime sectors and examining the potentially dramatic changes in the Post-Expansion Era. Hence, five IAME conference papers and an additional paper by Ducruet are chosen for this reason.

The paper by Pagano et al., “The impact of the Panama Canal expansion on Panama’s maritime cluster,” provides new insights into the question about the relationship between economic clusters and economic development. The authors use a Computable General Equilibrium Model to estimate the impact of the expansion of the Panama Canal on the Panamanian economy; they use economic data to estimate the reaction of this economy to changes in government policy, technology, and/or other factors. After examining the assumptions inherent in the model, the authors develop scenarios to explore the question of impacts. The authors’ analysis has identified the Panama Canal and its associated ports as driver industries in economic development, and they conclude that public policies focusing on further development of the linkages in transport–port networks can stimulate economic growth and the competitive advantage for this particular cluster. Whether the results are applicable to other maritime clusters remain to be tested and provide an avenue for further research by other scholars.

The paper by Justice et al., entitled “US container port resilience in a complex and dynamic world,” makes a significant contribution as it gathers insights from the literature on complex adaptive systems, arguing that this literature may assist port managers in addressing adverse events, problems, and uncertain outcomes. The paper discusses how US container ports can build resilience into processes in order to address uncertainty. In the current environment of step change in vessel size and scarce resources for port investment to adapt, this is a welcome complement to the mainstream port literature. As resilience is greatest when port managers are free to innovate and reorganize, and through innovation resolve the elements feeding traditional and nonresilient behaviors,

the paper provides port managers, non-US and US, with encouragement to be entrepreneurial in the face of uncertainty. This contribution to the management literature is a positive one, a contribution through emphasis on the importance of resilience as a means of managerial approach to addressing disruptive change. Given the increasingly turbulent environment faced by port managers everywhere, the contribution is not US centric but global; the authors' conclusion that the current "business as usual" reactive approach may no longer be adequate to cope with unexpected change or operating environments involving nonlinear interactions between agents.

The paper by van Hassel et al., "Impact of scale increase of container ships on the generalised chain cost," provides new insights on the effects of the increasing return to scales of container ships (implying decreasing generalized cost) to the costs along the total supply chain involving maritime transport, port, and hinterland. Generalized cost is calculated using a given container liner loop to first measure maritime cost. The costs of associated aggregate hinterland and route of ports are then defined and calculated. Unlike most of the studies when maritime cost dominates, the paper concludes that the influence of port process charges and hinterland transport costs outweigh the importance of maritime costs in the supply chain when the ship size increases up to 18 000 TEUs. This paper contributes to the literature by providing a step-by-step way to configure total generalized chain cost that can be applied to different shipping companies with various hinterland connectivity and accessibility.

Due to its ability to capture strategic independence during vertical and horizontal alliances, mergers and consolidations, and concession contracts, game theory recently has received lots of academic attention in port literature. The paper by Liu et al., entitled "The impact of Panama Canal expansion on the container-shipping market: a cooperative game theory approach," contributes to the literature by proposing a way of using game theory to quantify possible competition and/or cooperation among the supply chain players. The authors conclude that in multiple scenarios, such as changes in rates, coalitions, and size of container vessels, the Panama Canal expansion creates synergy for the East Coast ports and further leads to ports' superior performance compared to those on the West Coast. In practice, sophisticated simultaneous and/or sequential moving games are a suitable methodology to quantify the behavior of contracting parties in a bidding process with asymmetric information.

Similar to the emphasis of other studies in the special issue on essential investment, the paper by Shi et al., "A cross-region analysis of the output elasticity of transport investment in China," provides lessons in how a well-built transport network benefits the sustainability of economic growth in China. Over the studied period of 1990–2010, China has experienced devolution of administrative ownership moving from the central government to the local governments and the corresponding corporations. In the analysis, transportation investment in infrastructure is estimated as part of the individual output elasticity under the production function. Regional diversification and competition in transport investments are found to be critical in balancing and maintaining long-term economic returns. Future research can be done to identify to what extent the ports in the adjoining sea cooperate and/or coordinate in lobbying transport investment.

The additional paper by Ducruet, entitled "The polarization of global container flows by interoceanic canals: geographic coverage and network vulnerability," studies network vulnerability of global maritime traffic flows. An earlier version of this work was

presented at the international conference of “Interoceanic Canals and World Seaborne Trade: Past, Present, and Future” in 2012. The paper identifies that between 1996 and 2006, Europe and Asia were the most canal-dependent regions, followed by North America. With regard to the most canal-dependent shipping routes, Europe–Asia traffic through the Suez Canal remains on top. However, the importance of canals in global shipping has declined. The analysis provides new insights in the distribution of vulnerability at the port level, showing that Asian ports are less dependent due to the increasing intra-regional traffic. The optimal network configurations with external shocks and the measurement gaps between vessel movement and trade versus distinctions between port calls and container handled are directions for future research.

The above research suggests that further research is needed to learn how port supply chains, vulnerability, and resilience are affected by the operations of mega-ships and mega-terminals and how to address environmental concerns, energy efficiency, shipping finance, risk assessment, and port strategies in the Post-Expansion Panama Canal Era.

GRACE W. Y. WANG

*Maritime Administration, Texas A&M University at Galveston*

*E-mail: [wangw@tamug.edu](mailto:wangw@tamug.edu)*

WAYNE TALLEY

*Old Dominion University*

MARY R. BROOKS

*Rowe School of Business, Dalhousie University*