Competitive Uncertainty and the Widening of the Panama Canal

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Bottom Line Up Front (BLUF): Is the past prologue?

"The open, rules-based trading system has delivered immense benefits—for the world, for individual countries, and for average citizens in these countries".[1] The 'hyper-globalization of trade' over the past twenty years has seen a steady decline in ocean shipping costs for shippers and thus their customers. There is reason to be optimistic that this trend will persist. The widening of the Panama Canal can be viewed within the 'past is prologue' paradigm. Balance sheet investments by ocean carriers in bigger, faster, more fuel efficient ships, new infrastructure investments by ports, newly completed intermodal rail investments, and continued exploitation by all of IT and mobile communication advancements will continue the long run secular decline in shipping costs. But absent a significant increase in trade volume, this cost decline will be accompanied by potentially lower profit margins, lower revenues or both for all participants in the supply chain.

Hyper-globalization of trade has had some very positive consequences, deepening the interconnectedness of interests across countries, people, and companies. We must be cognizant, however, that the 20th century witnessed abrupt trade declines associated with two world wars that were largely unanticipated. Global trade did not recover to its 1914 level until 1970. We must be wary that potential alternative trade futures that can shape world trade and mitigate against the 'past is prologue paradigm' could arise from multiple sources: continued weak demand-side economics in the US; open and rules-based leadership declines as US trade dominance is replaced by the rise of China as the latter focuses on its domestic consumption issues; and territorial disputes that could lead to unanticipated conflicts and consequences such as the current Russia/Ukraine crisis and the maritime disputes between China and Japan.

To be sure, the expanded Panama Canal is one among several factors impacting the new competitive reality for West Coast ports. Indeed, some industry experts say that a confluence of factors – including all-water service from Asia to the East Coast via the Suez Canal—has

[1] http://www.gcf.ch/wp-content/uploads/2013/06/GCF_Subramanian-working-paper-3_-6.17.13.pdf, p 1

already begun to shift trade patterns.[2] While other such trends may be taking place, it is the intent of this paper to look specifically at the impact of the widening of the Panama Canal.

The analysis below concludes that the Panama Canal widening is likely to have a significant, and perhaps surprising, impact on global trading patterns. The global trading system will exploit the increased capacity provided by the widened Canal 3-7 years after it is in operation (initial effects felt by 2018/19)

The impact of Canal widening can be understood in terms of risk vs. uncertainty. Risk concerns balance sheet investments that will affect volumes and shipping rates. These major new investments may well continue the logic of rate decline. Uncertainty lies in the timing and economic geography of "winners" who particularly serve the Midwest market battleground.

The Panama Canal Retrospect and Prospect:

Will the widening of the Panama Canal create a new normal for world trade? As of February 28, 2014 the Canal overall expansion was 73% complete and the opening of the widened Canal was delayed to December 2015, with uncertainty continuing to surround the date of completion[3].

The West Coast Ports (WCPs) have benefitted enormously from the vast export volume generated from East Asia, and especially China, to the United States in the past two decades. The WCPs have been the primary gateway to the U.S. market, with roughly fifty percent of all goods received then trans-shipped by rail to major population centers in the Midwest, Southeast and Northeast. Will this pattern be sustained once the widened Canal creates greater opportunities for all-water transit from East Asia to the East, Southeast, and Gulf Coast Ports? What are key players—shippers, ocean carriers, ports, intermodal rail carriers—planning to do to take advantage of the increased capacity provided by the widened Canal? It should be noted that a number of shippers and ocean carriers are increasingly opting for the Suez Canal route to East Coast Ports (ECPs), especially for goods sourced west of Singapore[4].

A detailed and on-going literature review and interviews with fifteen leading industry officials were conducted to address these questions.

<u>Retrospect</u>

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[2] http://www.joc.com/port-news/panama-canal-news/production-shifts-mega-ships-challenge-panama-canal_20131108.html

[3] http://micanaldepanama.com/expansion/progress/;http://www.pancanal.com/eng/pr/press-releases/2014/03/20/pr508.html

[4] http://www.joc.com/maritime-news/container-lines/apl/demand-waning-premium-ocean-carrier-services_20131022.html

Canal construction was first begun by the French in the late 1800s, but ran into difficulty because of insufficient capital, malaria and yellow fever that made working conditions arduous, and an incorrect design that did not take into account that the Caribbean side of Panama was at a lower sea level than the Pacific side. In 1904 the United States purchased the Canal from Panama for $10 million, paying $40 million to the French company, Compagnie Nouvelle du Canal de Panama. The United States built the Canal, which opened in 1914 at a cost of $375 million; it ran Canal operations for 85 years until December 31, 1999 when the Panama Canal Authority took over operations.

The 51-mile long Canal connects the Caribbean Sea to the Pacific Ocean, with ships raised and lowered 26 meters as they transit through the locks from one ocean to the other. The average in-transit time was 13 hours in 2008, with some vessels requiring 35 hours because of construction for Canal widening.

The Canal is reaching maximum capacity, now carrying more traffic than it was designed for without the infrastructure necessary to handle the Post-Panamax vessels which account for 30% or more of the world's containerized maritime shipments. [Note: Post-Panamax ships include supertankers and the most modern container vessels that will be able to pass through the new lock dimensions of 1400 ft. in length, 180 ft. in beam, and 60 ft. in depth][5]. The current two locks are at or near capacity at almost all times, with long waiting periods for ships to enter the Canal, costing shippers millions of dollars annually.

In 2006 construction of a third set of locks was approved by the Panamanian government and its populace. It was originally proposed in the 1930s, but delayed by World War II, and not taken up again until recently for lack of funding and other reasons. The Canal is by far Panama's largest revenue source; some estimates suggest that, once expanded, it could vastly improve the economic well-being of most Panamanians.

The $5.25 billion project is financed by a 20-year loan; loan payments will start in 2018 due to a 10-year grace period. As noted earlier, the Canal expansion is now expected to be completed by mid-to-late 2015, one year later than the original date. The expansion would enable an additional 15 ships or more per day to pass through the Canal. But more importantly, it will most probably handle the Post-Panamax ships from the 8500 TEU average range up to 13.2K TEU ships.[6] The former ships are 25 percent longer and 50 percent wider than the ships currently traversing the Canal and could each carry two-to-three times the cargo.

This expansion has the potential to significantly transform global trade patterns. Currently, the Panama Canal faces direct competition from two main sources: the US intermodal system and

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[5] www.wikipedia.org/wiki/Panamax

[6] https://www.pancanal.com/eng/pr/press-releases/2013/04/10/pr469.html

the Suez Canal exports from South China and South Asia to the East Coast Ports. Currently, exports using a combination of ocean and intermodal transportation take 12.3 days to cross the Pacific, plus 6 days across the US by rail totaling 18.3 days. The Asia-Panama Canal-US East Coast route claimed 19% of Asian exports with an average navigation time of 21.6 days. The Asia-Suez Canal-US East Coast route handled 6 percent of Asian exports with average navigation time just in excess of 21 days.

Transportation and the Changing Nature of Trade:

The economist John Maynard Keynes observed that most firms project their current position into the future:

> "The power to become habituated to his surroundings is a marked characteristic of mankind. Very few of us realize with conviction the intensely unusual, unstable, complicated, unreliable, temporary nature of the economic organization… We assume some of the most peculiar and temporary of our late advantages as *natural, permanent, and to be depended* on, and we lay our plans accordingly"[7].

Keynes, writing from the perspective of a participant in crafting the WWI Armistice terms for Germany, known as the 1919 'Peace of Paris', was acutely aware of the changing nature of trade and economic activity.

Economists have since identified four periods in the 'globalization' of trade.

- The first was from 1870 and 1914 or the 'golden age of world trade'. World trade in 1870 was 9 percent of global GDP. By 1914, on the eve of World War I or the "war to end all wars", it had moved up to 16 percent of GDP. Keynes pointedly described this pre-war age that was about to come to an end:

  > "What an extraordinary episode in the economic progress of man that age was which came to an end in August, 1914! The greater part of the population, it is true, worked hard and lived at a low standard of comfort, yet were, to all appearances, reasonably contented with this lot. But escape was possible, for any man of capacity or character at all exceeding the average, into the middle and upper classes, for whom life offered, at a low cost and with the least trouble, conveniences, comforts, and amenities beyond the compass of the richest and most powerful monarchs of other ages. The inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth, in such quantity as he might see fit, and reasonably expect their early delivery upon his doorstep; he could at the same moment and by the same means adventure his wealth in the natural resources and new enterprises of any quarter of the world, and share, without exertion or even trouble, in their prospective fruits and advantages; or he could decide to couple the security of his fortunes with the good faith of the townspeople of any substantial municipality in any continent that fancy or information might recommend…But, most important of all, he regarded this state of affairs as ***normal, certain, and***

[7] Keynes, J.M. *The Economic Consequences of the Peace*. (New York, 1920) p.3.

permanent (emphasis added), except in the direction of further improvement, and any deviation from it as aberrant, scandalous, and avoidable"[8].

- The second period between 1914 and the end of World War II saw the collapse of globalized trade. World trade plunged to a low of 5.5 percent of world GDP just before World War II began.
- A third era, starting after World War II, saw the restoration of world trade, aided by declines in transport costs and trade barriers. Only by about the mid-to-late 1970s did world trade revert to the 16 percent of GDP peak that occurred before World War I.
- The current period of 'hyper-globalization' has seen trade outpace global GDP. Hard and soft goods exports-to-GDP ratios moved from 15 percent to 26 percent. Thus exports are growing faster than overall GDP growth, with goods and services exports rising to about 33 percent since the mid-1990s[9].

Some of the developments behind hyper-globalization include reduced transportation costs through containerization, rapidly declining air transport costs, and greatly expanded information and communications technologies (ICT), all leading to vertical disintegration of production around the world which is the opposite of the vertical integration of production that characterized most of the 20th century. Containerized shipping has lowered shipping costs significantly; however, ocean shipping costs dropped less dramatically, ranging from 3%-13% since its introduction in 1968. Investments in containerization, while dramatic, did not initially produce a drop in costs. Ocean shipping, which constitutes 99% of world trade by weight and a majority of world trade by value, exhibited little price change from 1952–1970, but substantial rate increases from 1970 through the mid-1980s. While containerization has dramatically decreased costs, the period 1970 through the 1980's is notable because ocean transport costs increased due to fuel cost increases and port infrastructure build-out expenses. <u>However, this was followed by a steady 20-year rate decline</u>[10].

<u>Prospect:</u>

The current widening of the Canal has stimulated infrastructure investments in bigger, faster more fuel efficient ships, deepened ports with expanded cargo handling capabilities, intensive rail investments in the US, Canada and Mexico, and "cloud"-based information and communication technologies (ICT). These continuing responses by key players in a pattern of

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[8] Ibid., pp. 11-12

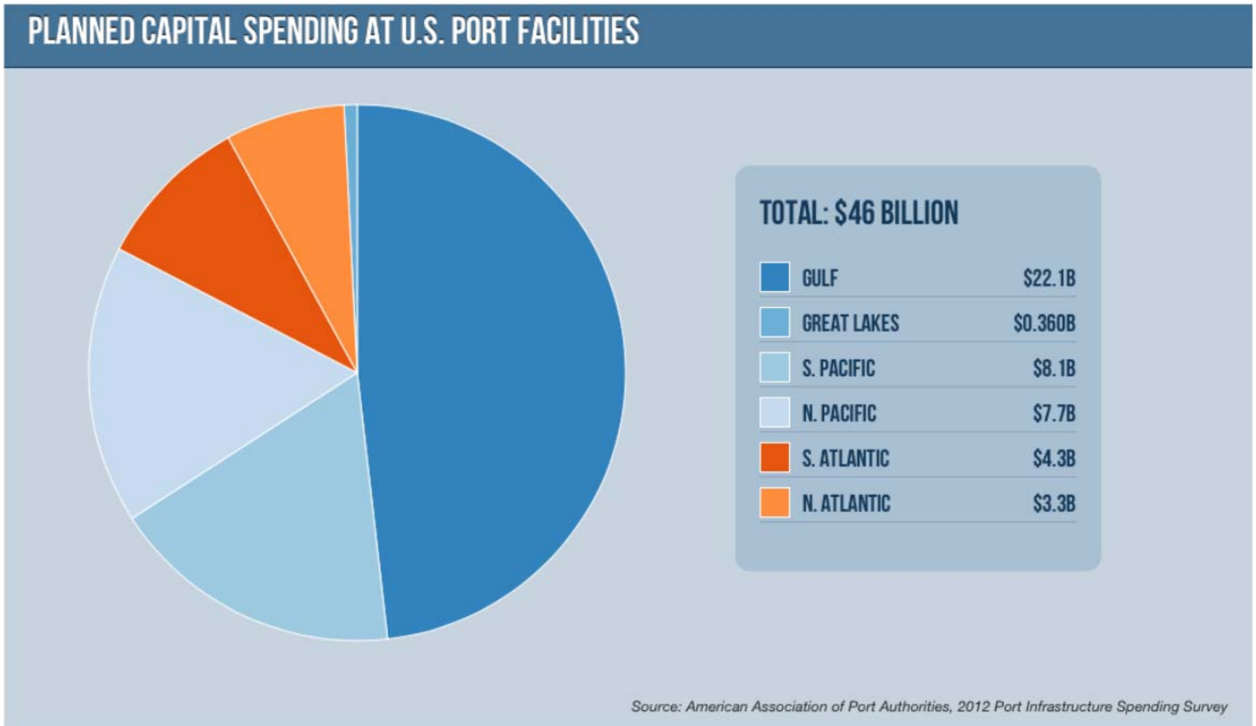
[9] Frieden, J.A. <u>Global Capitalism: Its fall and Rise in the Twentieth Century</u>. (New York, 2006); Hummels, D. 2007; "Transportation Costs and International Trade in the Second Era of Globalization" Journal of Economic Perspectives 21 (3): 131–54.; http://www.gcf.ch/wp-content/uploads/2013/06/GCF_Subramanian-working-paper-3_-6.17.13.pdf

[10] Hummel, D 2007, p. 152

"complex adaptive behavior," are all self-reinforcing actions based on rational, self-interested calculations, creating "competitive uncertainty" in the face of this hyper-globalization of trade.

One consequence of these trends has been an increase in US port infrastructure investments. These are currently projected for the period 2012-2020 to be forty-six billion dollars[11].

Current planned Capital Expenditures on Ports and Facilities 2012-2020:



Of the $46 billion capital investments, both public and private, nearly $30 billion or 65% will be in economic geographies encompassing the East and Gulf Ports.

From 2012 to 2020, it is estimated that 75% of the capital investment needs of U.S. ports will be for port expansion, with 25% for rehabilitation of existing assets. After 2040, the majority of investment needs are projected to shift to rehabilitation[12]. Highlighting a few examples of this activity, the Port of Savannah estimates that deepening the Savannah River channels by just six feet would reduce shipping costs by 15 to 20%, as larger container ships require fewer individual trips[13]. Coupled with port infrastructure automation, it is estimated the two measures will provide a $50 per cost advantage over WCPs to unload an individual container[14].

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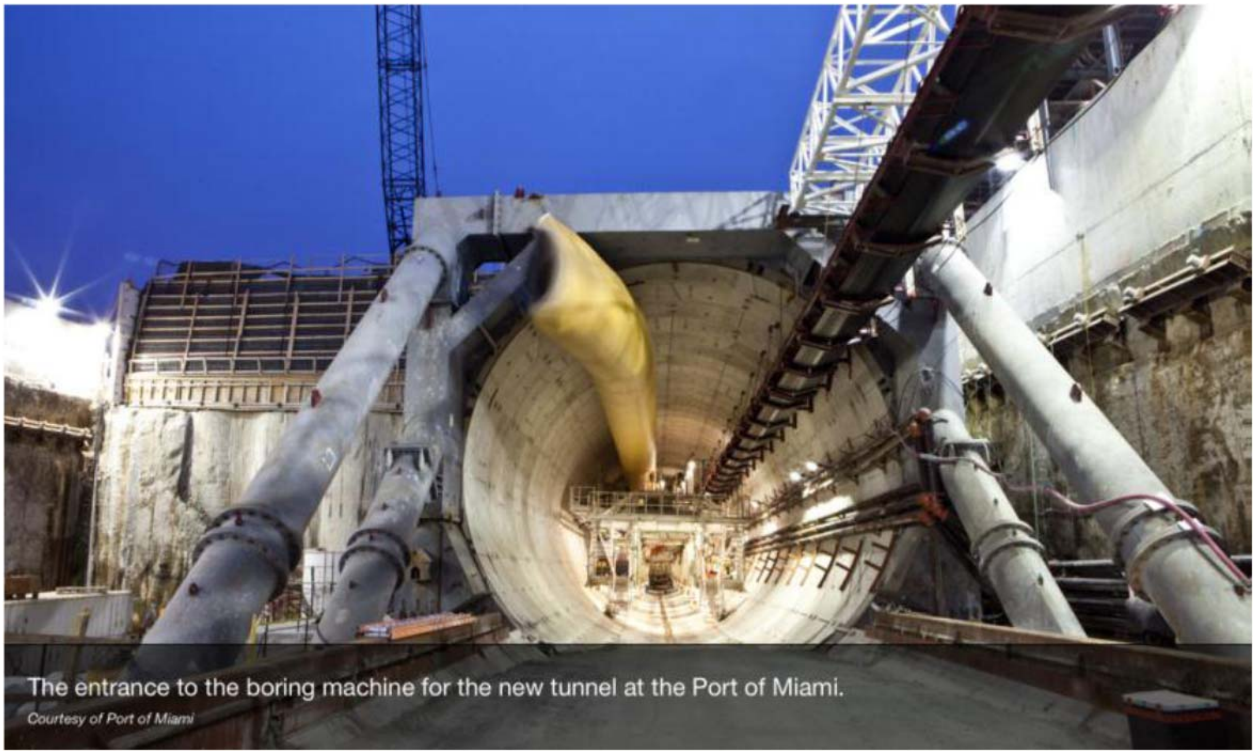
[11] American Association of Port Authorities http://www.aapa-ports.org

[12] America Society of Civil Engineers (ASCE), "2013 Report Card for Americas Infrastructure"

[13] Robert Leachman, Professor of Industrial Engineering and Operations Research at University California, Berkeley, has stated "if the cost of transportation from origin to destination on a certain route increases or decreases 10% or more, it will usually produce a noticeable shift in routing." Thus, if trends in declining transportation costs continue with the widening of the Panama Canal, significant shifts in routes are likely to occur. This projection is contrary to some industry leaders who do not



The entrance to the boring machine for the new tunnel at the Port of Miami.
Courtesy of Port of Miami

Port of Miami, FL is finishing $2 billion in infrastructure improvements including deepening waters to 50 feet, constructing a port tunnel for more efficient access to and from the island port facilities, and providing on-port rail linked to the national rail network to double trade after the Canal is widened. The photo above indicates the massive nature of this undertaking.

These investments are aimed especially at the Midwest battleground for all water service vs. the trans-Pacific service.[15]

Competitive Uncertainty

Because of this network of complex competitive behavior, all parties are required to understand the difference between risk and uncertainty. One classic means of understanding risk can be seen in the forecast that an earthquake of a magnitude of 6.8 or higher will hit San Francisco about once every thirty-five years. What is uncertain is *when* it will occur. [16] Uncertainty is what firms fear the most, because it cannot be measured or priced as risk can be. But when firms mislabel risk as uncertainty, they become vulnerable to the assumption that since it cannot be measured, they might as well ignore it. For example, the search for a

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see much change forthcoming. http://www.joc.com/maritime-news/trade-lanes/trans-pacific/tpm-panama-canal-expansion-no-game-changer_20140310.html

[14] Interview with GA Ports Authority Executive

[15] Drewry Supply Chain Advisors, "US Transpacific Intermodal – White Paper", Published 2008

[16] Silver, N *The Signal and the Noise*, (New York, 2012) pp.,149-152

“Northwest Passage is an age-old quest that may be a reality in the not too distant future”[17]. The US Department of Defense estimates we will continue to see a 10-to-20 percent increase each year in ship traffic through the region[18]. Uncertainty cuts both ways, however. The rapid decline of Arctic ice will enable a shorter route from China to East Coast Ports, but it cuts against us as the melting sheets are a sign that global warming is advancing more rapidly than our ability to take effective action to contain the negative consequences.

Is the Past Prologue?

Since 1990 as noted above, we have witnessed a steady decline in container rates. Will this decline continue and will trade volumes change from WCPs to East Coast Ports (ECPs) with all water routes to ECPs/Gulf Coast Ports (GCPs) as a result of the Canal widening? What will be the impact of $46B in infrastructure investments and 65% of them in non-WCPs? Will the volumes follow those with lower prices or are shippers and consumers the only winners? Many who study the industry claim that little will change. Others see no clear consensus on the effects of the Canal widening on trade volumes shifts[19]. Still others see “that up to 25% of the US West Coast ports’ current cargo base (primarily hinterland cargo) could be lost to the East Coast and Gulf ports in the decade to come…. a rejuvenated, aggressive and soon-to-be widened Panama Canal … is about to take that not-so-captive market away, possibly forever”[20]. In interviews with fifteen key executives in the transpacific supply chain, twelve projected that rates will go lower and produce a significant shift of volumes from WCPs to ECP & GCPs[21].

In an uncertain future, decisions must still be made or there is the risk of ‘stranded assets’ where these assets lose economic value well ahead of their anticipated useful life. As Keynes well understood, the past is not necessarily prologue. From a “risk” perspective, how likely is it that all these investments will be ineffective in the medium-to-long term? “Uncertainty” will lie in the “when” price and volumes shift and the “who” will accrue the benefit.

What do Industry Executives Believe?

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[17] http://www.theglobeandmail.com/report-on-business/international-business/european-business/bulk-carrier-capitalizes-on-arctic-shortcut/article14405743/;

[18] Maritime traffic through the Bering Strait shot up by about 50 percent between 2005 and 2012. In 2012, 483 ships moved through the strait separating Alaska and Siberia, some picking up cargo in the Arctic and taking it out, others use icebreakers to travel across the Arctic through what’s called the Northern Sea Route. - http://www.washingtonpost.com/world/the_americas/us-eyes-increase-in-arctic-operations/2013/11/22/865f7280-534e-11e3-9ee6-2580086d8254_story.html

[19] Rodrigue, J-P, “Factors Impacting North American Freight Distribution in View of the Panama Canal Expansion” The Van Horn Institute, 2010

[20] Drewry Supply Chain Advisors, “US Transpacific Intermodal – White Paper”, Published 2008 – N.B. half of the time period has elapsed for their prediction and the Canal is behind its original time schedule, with the widened Canal opening now delayed to December 2015.

[21] Twelve of the fifteen industry executives we interviewed believe that the widening will be significant in both price and volumes.

Certain players anticipating the Panama Canal widening, such as ocean carriers, are deploying bigger, faster ships or re-deploying assets to Colon, Panama that will optimize their returns. They seek to mitigate sharing transport revenues with intermodal carriers in their current proportions and seek to take advantage of new and emerging South American trade which is witnessing a growing middle class that demands more modern goods and services[22]. Other participants in the transpacific trade are studying the changes intensively. Shippers, in simple manufacturing or standard retail [but not non-fast fashion segments], await completion of these infrastructure investments and prices to be posted, before they commit to changing their "network" strategies. Rail carriers too are investing to gain and/or maintain their current positions in the supply chain[23]. Some ECPS, GCPs and WCPs are making investments to gain or maintain market share, but risk stranding current port infrastructure investments if container volumes do not increase as projected. WCPs in particular are subject to stagnating trade volumes or failure to keep pace with east-bound transpacific trade volumes, resulting in share decline.

As noted previously, the period from the 1970s to the mid-1980s saw ocean shipping costs increase due to fuel cost increases and port infrastructure build-out expenses. Currently, some of these same constraints still exist for all ports. Fuel bunker costs remain volatile, port congestion is still an issue, especially for the SuezMax (12-19 TEU) class of container ships, and new environmental regulations are a challenge to all ports. The WCPs' experience is particularly salient as congestion and environmental regulations are especially painful to the independent truckers servicing the ports[24]. Port congestion will require continued attention for all ports capable of handling 13+k TEU big ships. SuezMax big ships, which require longer quay crane reach and back reach facilities, experience 3-4 days unloading time to turn a ship around. Some consignees like big-box retailers observed that this congestion prevented them from automatically seeing value from big ship transit in terms of reliability and the timing of goods delivered.

STAKEHOLDERS PERSPECTIVES

Who We Interviewed: Participant Interviewees (45-90 minutes each)

- *Ocean Transportation*: Three Ocean Carriers Executives
- *Port Authorities*: Two East Coast Port Authorities Directors and One West Coast Port Authority Director
- *Industry Associations*: Retail Operations & Agriculture Transportation
- *Intermodal Rail*: West Coast Rail Executive & *East Coast Senior Executive and staff*
- *Shippers* - Retail Industry: *Global Retail Executive and Manufacturing Executives*
- *Maritime Consultants:*
- *Panama Cabinet Official*:

[22] Interviews with three Ocean Carriers top executives

[23] For example BNSF has invested more than $41 billion since 2000, including a record $4.3 billion in 2013. Some of this investment is intended to provide near-dock rail and quadruple tracking from the Los Angeles/Long Beach Ports for cargo headed east. http://domino.bnsf.com/website/updates.nsf/updates-customer-industrial/9BE932CA1B5C6E9686257BBE007A566D?Open

[24] http://www.sfgate.com/bayarea/article/Oakland-truckers-strike-to-protest-pollution-rules-4917925.php

Questions used to guide the discussions are included at the end of this paper

Shippers*:* Taking micro- and macro-level economic conditions and possible geopolitical obstacles into account, shippers can be expected to formulate their plans or 'network strategies' starting in the fall of 2015. Initially they expect to take advantage of the Canal's greater capacity through attention to cost, timing and reliability. Many retailer shippers are spending almost as much capital on new distribution centers and logistics technology as they are in new store openings. Shippers will adjust their behavior over time as other key players - retailers, ocean carriers, intermodal carriers, ports, and the Panama Canal Port authority--each adjust dynamically to the increased system capacity. One large retailer stated that a key is the response of intermodal carriers Union Pacific & BNSF to both price and service. This observation reflects the understanding that the rail carriers' response is affected by immunization from Federal anti-trust laws. Some shippers of high value goods cannot accept longer transit times and will continue to trans-load on the WCP; but these shippers recognize that this is not as large a segment of the overall market as many think.

The U.S. Department of Agriculture introduced the Ocean Shipping Container Availability Report (OSCAR) in July 2012. OSCAR helps distributors, retailers, and others to better manage transportation costs and increase "match-back" shipments. OSCAR provides shippers with three weeks of future estimates and projections of inventory of dry, high cube and refrigerated containers and thus will be a source for all strategic planners to understand the changing nature of competition by geographic area. Those retailers that are nimble enough to optimize their operations will be at a competitive advantage by 2015/2016, but ECPs will need to provide more services to make the switch.

Retailers will be watching the details of the ILWU contract for 'flexibility'. Retailers see WCPs gate congestion and turn times as areas needing special attention, especially with the additional days to unload the SuezMax class of big ships. While the 2002 ILWU contract "Technology Agreement" was trend setting, the fruits of that agreement will need to be implemented more completely to minimize yard congestion which would in turn help mitigate growing competition from ECPs, the local port truckers' economic viability, and environmental concerns[25].

Retailers normally require a lead time of 6 months to reconfigure their network strategies based on service levels, cost and reliability. However, in crisis situations such as Hurricane

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[25] The TraPac's Automated Stacking Cranes (ASC) ballooning cost investment by the Port of LA demonstrates the perils of finding the optimum investment balance of automation technologies and continuing productivity increases. http://www.worldcargonews.com/htm/w20131123.353336.htm; "Marine highway dedicated" Ports of Oakland and Stockton "green corridor" http://www.worldcargonews.com/htm/w20131125.268041.htm; http://www.insidebayarea.com/news/ci_24353992/some-oakland-port-truckers-stop-working-protest-rising?IADID=Search-www.insidebayarea.com-www.insidebayarea.com

Sandy, retailers demonstrated their capacity for much more rapid and effective response. Investments in infrastructure and new technologies will enhance shippers' choices. They will be able to divert to the most cost effective routes in a timely fashion. Turn time for product is a key issue as is "cost-to-hold inventory." A shipper can and will wait to see what the Panama Canal Authority rates will be over time which, at present, is an important variable in its projected cost calculations.

The real question is the cost of holding inventory. 'Fast Fashion' retailers will not hold inventory, so they will not use all water to ECP. However, 'value merchandise retailers' will see margin as key and are not as averse to longer transit times if reliability is assured. Value merchandise retailers are investing in distribution centers in Colon, Panama, as noted previously.

Houston is expected to benefit greatly over time from South American consumer trade. However, retail shippers to the Chicago statistical metropolitan area (SMA) see Gulf ports adding increased time to shipments given their greater distance and time to travel west from the Canal.

The environmental sustainability attributes for each mode of transportation are being studied and analyzed intensively by shippers/retailers. Rail is viewed as more environmentally sustainable than trucking. Thus the intermodal rail investments by East Coast rail carriers on the Ohio and Heartland upgrades will be attractive.

Retailers use a "China+1" approach to keep themselves from being strategically captured by their Chinese suppliers and thus source some of their required products outside China. Vietnam is able to produce low-cost soft goods, but a major constraint is lengthy transit times from production site in country to port for export, and that can be clearly problematic. India is seen by some to be burdened by highly inefficient bureaucracy and lack of effective transport infrastructure. Retailers and manufacturers sourcing business west of Singapore for ECP will ship goods through the Suez Canal (so long as it is reliable).

Changing factors of production and terms of trade are seen in Japan's slow trade growth. Japan has tried various strategies to mitigate its 20-year slow GDP growth in the face of hyper-globalization. It has shifted sourcing to India and Southeast Asia. More recently it has adopted 'Abenomics', or a monetary policy of 'Quantitative Easing' (QE) and fiscal stimulus to change the value of the Yen and the terms of trade. Hyper-globalization and the vertical disintegration of production is illustrated by Korea's Samsung that ships parts through the Ports of LA/LB to its Mexico maquiladora and back to U.S. markets.

Ocean Carriers*:* Initial estimates are that price levels on a Panama Canal water route for a Chicago-bound forty-foot equivalent unit (FEU) container will drop in the range of 12-14% from

$3200 to $2800 because of increased competition in the 3-7 years after the widened Canal is fully operational[26]. Ocean Carriers are diversifying balance sheet investments by establishing Big Ship trans-shipment hubs on the Atlantic side of the Canal encouraged by the PCA with a 'one-stop-shopping" administration for all participants in the supply chain.

Ocean carriers will trade off lower prices for increased revenues on all water routes for those products where speed is secondary (e.g., household goods, appliances and furniture) but 'fast fashion retailers' will remain in the domain of WCP as speed-to-market is still key. Shipping lines in the anticipated overcapacity situation will prefer to use their own assets, for which they have already paid, to avoid out-of-pocket inland costs on long-haul rail from WCP. Pricing is a key variable, but the Big Ships' stevedoring function can last 3-4 days. So even with lower pricing for the ocean transport segment, a particular shipper's goods may not be unloaded with timely assurance.

What about Caribbean trans-shipment? Will Kingston, for example, be a significant player? Mediterranean Shipping Company's standing strategy is to use Freeport and Kingston as trans-shipment points. However, some key retail players are skeptical of the impact of Caribbean trans-shipment because of projected added handling costs and time delays. Some claim that if these big ships, using the Caribbean ports as trans-shipment points, are not at greater than 80% of capacity, they will be not be economical for retailers to change their 'network strategies'.

The Ports of LA/LB are continuing to implement infrastructure improvements that will minimize throughput bottlenecks. More backland behind berths and larger capable cranes to speed up unloading/loading are forthcoming. Bigger 12k-13k TEU ships are docking there currently with more near-dock rail. Port permitting processes are being enhanced. WCP market share impact may be muted by the 10% market share loss that has already moved to the ECP attributed to the WCP 2002 work stoppage. The trans-pacific trade split between WCPs and ECPs now stands at 65/35% (although 70% of U.S. population is still east of the Mississippi river). Smaller WCPs are likely to be more adversely affected by the shift of some carriers to all-water routes. For Oakland it is all about capabilities, especially intermodal rail connections for East bound imports. For Seattle and Tacoma a rationalization of governance structures for such closely competing port entities may be necessary to remain competitive[27]. WCP labor issues are always

[26] A 40 ft. container destined for the Chicago SMA that is now $3200 will drop to $2800 or 14%. The ocean carriers traveling all water to ECPs will increase their topline revenues by $884 per container or a 74% increase. These are very compelling increases for those products that are not time sensitive to the additional 3-5 days for all water routes to ECPs. A central consideration will be to determine the size of that market on an incremental basis that is over and above the current trend line growth. The January 1, 2014 SCFI comprehensive reading was $1,176 per FEU; down 4.5% year-over-year. The spot rate for shipments to the U.S. East Coast was $3,137 per FEU, down 11% from the previous year. (Source: Shanghai Shipping Exchange | www1.chineseshipping.com.cn/en)

[27] http://www.joc.com/port-news/us-ports/port-tacoma/terminal-consolidation-seen-crucial-seattle-tacoma_20140421.html

an irritation to retailers. The Prince Rupert port is operating, but not as smoothly as expected because of cross-border customs issues.

Interviewees cited three additional factors that could affect the impact of the widened Canal: 1) Uncertainty about the European economic recovery and the projected value of the Euro; 2) Whether U.S. annual economic growth can move forward sufficiently to sustain container trade volumes; and 3) Outcome of the forthcoming labor negotiations with the West Coast ports.

One ocean carrier is deploying 34 new ships to WCPs and Colon, Panama. This ocean carrier will have 18 WCP trains each week that will provide frequency, coverage and speed that an all water route to ECP will not. However, this carrier is diversifying balance sheet investments by establishing a Big Ship trans-shipment hub on the Atlantic side of the Canal. This example illustrates how carriers are hedging their bets in case Panama Canal expansion has more immediate impact than some expect.

Trans-shipments will routinely pass through the Port of Colon in Panama. There will be projected substantial increases in North and South American trade using joint ventures, with Brazil a featured market. The growth of manufacturing capabilities and middle-income sectors in numerous Latin American countries could produce greater utilization of the expanded Canal for US exports to these countries. The US now has free trade agreements with the following Latin American countries: Mexico (as part of the North American Free Trade Agreement); Chile; Peru; Dominican Republic-Central America Free Trade Agreement (includes Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and the Dominican Republic); Panama; and Colombia. A Free Trade Areas of the Americas (including all Western Hemisphere countries) is being negotiated. The impact of growing Latin American export markets on WCPs, however, is not yet clear.

Ports: At present East Coast Ports /Gulf Coast Ports, intermodal carriers and ocean carriers focus on their balance sheet investments. But the emphasis will shift to their income statements once the new wider and deeper canal is operational, thus increasing their market geographic scale & scope.

Some of the balance sheet investments that are currently being completed on the East Coast ports to handle post-Panamax ships by 2015 are Baltimore (2013), Miami (2014), New York (2015) and Norfolk (complete). Savannah, Charleston and Jacksonville (the Southeast Coast Ports [SECPs]) all are moving to enhance their capacity to handle larger ships (from modal size of 4.5 TEU to 8.5k TEUs) by 2018. SECP officials believe these enhancements will provide a $50 per box competitive stevedoring advantage over WCPs. They argue that this will be a compelling value proposition when coupled with the ocean carriers' all water rate reductions to ECPs/SECPs.

Some SECPs with new 8,000 TEU ships see that they will have extended their competitive geographic reach from 800 to 875 miles that will encompass the SMAs of Memphis, Little Rock, St Louis, Indianapolis and Columbus, but not Chicago. Shippers see SECPs as more aggressive than WCPs as "not a week goes by that they are not contacting' shippers for their business."

While the trend toward more all-water ECPs has been developing over the last ten years, ECP port directors believe there is more potential, both for import and perhaps more importantly for heavy export cargo (e.g., Boeing). SECPs forecast a doubling of market growth for the years 2016-2020 compared to the previous five years.

Mexican ports were thought by most of those interviewed not to be a major factor affecting US container trade, despite the substantial growth of their manufacturing capabilities in recent years. They are experiencing double digit volume growth, but from a small base.

The Panama Canal Authority (PCA) is wooing assembly of products in Panama and building a new airport three times the current size to entice a one-stop shopping experience for potential shippers and ocean carriers.

Port perception by 'shippers' is differentiated by region. At the Port of Oakland, significant difficulties were cited in our interviews. The ILWU is seen as more problematic than at the other two major WCP regions; rail connections are not currently competitive with other WCPs; port management is new but well respected; funding sources for new port rationalization and reconfiguration are incomplete; and agriculture in some instances is moving to Los Angeles to avoid Oakland.

Some see agricultural patterns shifting from WCPs to the Ports of Prince Rupert, Vancouver and Lazaro Cardenas in Mexico, but sustaining these patterns will depend on the price competitiveness of Union Pacific and BNSF.

Potential competition to the Panama Canal within its own region is evidenced by the *announcement of investments approved by the Nicaraguan government for a new canal. This is* based on a proposal by Wang Jing, chairman and owner of the Hong Kong-based HKND Group. This development bears watching to determine its actual impact on the Panama Canal.

Overall, lower costs available through an all-water route using the Canal to ECPs should continue the twenty-year rate decline that containerization initiated, facilitating hyper-globalization. West coast ports are responding preemptively by increasing capacity to handle larger ships and by providing more near-dock rail and financial rebates to users to attract incremental business.

Intermodal Rail Carriers: East and Gulf Coast rail carriers have completed or will soon be finishing new rail investments for markets east of the Mississippi. The impact of these investments is that the widening of the Canal may not be as great as containerization but will be 'significant'. It is, however, important to note that rail investment and build-out to the Ohio Valley is seen by them as a '*risk*' based assessment or an 'entry ticket to remain competitive' and not a grand bet. The timing of these intermodal rail investments returns is '*uncertain*' but may become apparent by 2016-17. Rail carriers see retailers diversifying risk and will take full advantage of new freight efficiencies & services that may take 3-7 years to materialize.

- Stack trains could start rolling out of Baltimore by 2018 but could be delayed until 2022.
- Savannah has on-dock rail capacity by both major rail carriers that helps provide what it sees as a cost advantage over WCPs.
- Memphis touts that it has 2/3 of US population within 750 miles and rail carriers are completing new investments. The Memphis market is evolving as Canadian National Rail acquired the Illinois Central railroad that serves that market. Chicago sees Memphis as a rail hub threat. However, a West Coast rail carrier competitor observes that there are no distribution centers in Indianapolis, indicating his belief that intermodal rail competition has yet to effectively materialize in this corridor. Texas/Gulf Coast has a water depth problem and rail to Midwest is an issue, but rail carriers are investing in New Orleans and Mobile. There are no known signed contracts by shippers to move out of WCPs to ECPs, making a few interviewees still skeptical of the short-term impact of the widened Canal. However, several investments by large national retailers--Ace Hardware's recent selection of the Hampton Roads area for its East Coast import re-distribution center; Target's build-out of distribution centers in the Midwest and East Coast as a result of the 2002 WCP work stoppage; and Kohl's shift to ECPs as part of its national growth expansion plans–are all signs of change.
- Houston, some argue, will not be a big player as a result of the Canal widening as its infrastructure is not built for 12k-15k TEU ships, but will be able to support 8K TEU ships that will be calling on Savannah. One should expect rail carriers will maintain their single-line haul freight (e.g., Memphis to Chicago and Dallas to Chicago). But the two-line haul freight (e.g., Atlanta to the Gulf Coast and the Gulf Coast to Memphis) will be increased as a result of the capital investments by CSX and Norfolk and Southern.
- BNSF and UP are making capital investments and are well positioned with near-doc rail upgrades and quadruple tracking in some areas.

The rail carriers see the Chicago SMA as a major new incremental revenue opportunity and will price accordingly. Potential changes in the Chicago market were emphasized by virtually all interview participants.

What is apparent is the continuing projected increase of domestic container shipments by intermodal rail that is not ISO (water transport container shipments). “For the tenth quarter in a row, domestic container volume flexed its muscles and has outpaced international shipments driving the gains in total intermodal traffic ”; the third quarter also marked a milestone as “the first time seasonally adjusted domestic shipments exceeded international shipments” said Joni Casey, President and CEO of the Intermodal Association of North America (IANA). Domestic growth has outpaced the international market since the 2008 recession[28].

Third Quarter Totals

	2012	2013	Change
Trailers	406,648	411,659	1.2%
Domestic Containers	1,423,019	1,557,084	9.4%
All Domestic Equipment	1,829,667	1,968,743	7.6%
ISO Containers	2,001,850	2,041,839	2.0%
Total	3,831,517	4,010,582	4.7%

IANA

Source: IANA Intermodal Market Trends & Statistics Report

All these developments reflect a dynamic strategy by the intermodal carriers to be competitive in terms of cost and time-to-delivery as a response to the changing conditions of domestic and international trade.

Summary and Conclusions:

The Panama Canal widening is likely to have a significant, and perhaps surprising, impact on global trading patterns. The overwhelming view of those interviewed is that the system will exploit the new capacity provided by the widened Canal 3-7 years after it is in operation (initial effects felt by 2018). Forecasting short-term and medium-term timing is ‘uncertain’ because of the complexity of shifting operational and pricing strategies by numerous players each seeking competitive advantage. Most key players are studying their options intensively to optimize their financial returns.

The main findings of this study are:

1. While the widening of the Panama Canal has been delayed and is now expected to be completed by December, 2015[29], shippers can be expected to formulate their plans in the fall of 2015 on how they initially expect to take advantage of the Canal's greater capacity. They will be attentive to cost, timing and reliability and will adjust their behavior over time as other key players - ocean carriers, intermodal carriers, ports, the Panama Canal Port authority (PCA)--

[28] http://www.intermodal.org/information/statistics/index.php
[29] http://www.pancanal.com/eng/pr/press-releases/2014/03/20/pr508.html

each adjust to increased system capacity (a decision-making process of complex adaptive behavior).

2. The Statistical Market Area of greatest competitive intensity will be Chicago as East Coast Ports and Gulf Coast Ports expand their capabilities, more intermodal options become available from each area as ocean and rail carriers move off balance sheets onto their income statements, and as continued effects of global warming open greater utilization of Prince Rupert and other Canadian ports.

3. U.S. port elasticity studies demonstrate the crucial role of intermodal competition in the destination market.

4. Data from the Port Import/Export Reporting Service (PIERS) shows that, for the first time since World War II, the East Coast surpassed the West in container traffic growth. Eastern ports saw traffic grow by 5.5 percent in Q1 2012 over the same quarter in 2011, as compared with 3.0 percent in the western ports. Eastern traffic growth will accelerate further after the 2015 Panama Canal expansion is complete.

5. Initial estimates are that prices on a 40 ft. container (FEU) destined for Chicago will drop 12-14% because of increased competition in the 3-7 years after the expanded Canal is operational.

Conclusions

The impact of Canal widening can best be understood in terms of risk vs. uncertainty. The risk concerns balance sheet investments that will affect volumes and shipping rates (except for certain commodities such as fast fashion and electronics). Containerization has by-and-large produced a steady decline in shipping rates for more than two decades. These major new investments may well continue the logic of rate decline. The uncertainty lies in the timing and economic geography of "winners" who serve the Midwest market battleground. West Coast Ports will need to respond with aggressive and innovative measures to avoid losing significant market share once the widened Canal is fully operational.

Uncertainty, as many economists recognize, is thus a reason for action, not inaction, and for thinking through in advance the impact of plausible alternative futures on current practices.

Appendix

Participant Interview Questions:

- Do you think widening of the Canal will have a major impact on global trading patterns?
- Some claim this could be the most significant development in maritime trade since the widespread introduction of container shipping in the 1960s. Do you agree? If so, what specific changes do you visualize? If not, why not?

- Do you think there will be a consistent response among shippers using the land bridge between the West Coast and the Midwest and East Coast? Or, will issues of cost, speed to market, and reliability differentiate shippers' behavior?
- If you think shippers will react differently, how do you anticipate individual segments--electronics, vehicles, soft goods, wood products--responding?
- Do you anticipate that Houston and/or particular East Coast ports--such as Charleston--will be beneficiaries of changing trade patterns? And which West Coast ports would be most adversely affected?
- How significant will shifts in price and transportation routes by UP, CSX and other intermodal carriers on shipping strategies? Is this a crucial variable in anticipating future change?
- Will new trans-shipment capabilities in the Caribbean be significant? If so, how?
- Do you foresee different patterns among major East Asian states--Japan, China, South Korea, and Vietnam? What about anticipated manufacturing shifts from Southeastern China to Northern India?
- What about the influence of other considerations: for example, climate change opening up northern routes to Canadian ports? Egyptian political uncertainty affecting Suez Canal usage? Widening of Mexican ports? Labor strategy adjustments? New US government funding or legislation?
- Whom do you suggest we interview for this project--carriers, shippers, terminal operators, individual analysts? Could you provide introductions? Could we receive candid, not-for-attribution feedback from individual shippers on their future plans?
- Do you think a scenario-planning exercise--to identify possible alternative futures and their implications--would be useful for contingency planning?