



Port Significance

Contributions to Competitiveness in Latin America and Asia

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Abstract

This paper seeks to examine the significance of port placement relative to economic success. In our globalized world, companies look to expand their businesses overseas through export tactics. As a result, a country's GDP is significantly affected by the ability of companies to export their goods and services globally. Convenient, effective transportation ports have the potential to significantly increase economic growth and success of nations. Current literature examines the competitiveness of ports and provides cost/benefit analysis of construction, but fails to provide extensive case-specific examples of this important concern in the infrastructure.

The first section of this paper will describe general information concerning ports, including placement and economic consequences. The latter half of the paper will examine this topic in a global context, particularly focusing upon economy. Finally, it will examine how these topics interconnect, provide predictions and recommendations for the future of this concern, and describe specific examples of port projects in Brazil and China.

Current Status of Ports

As a result of intense competition in the port industry, the container shipping industry has changed significantly. Major shipping conglomerates have attempted to globalize their services through joint ventures, mergers, etc., facing slimmer profit margins. Concurrent with this movement has been an increase in deployment of larger vessels in order to enhance cost efficiencies through economies of scale.¹ Similarly, airports have continued to be utilized for their ability to secure or improve competitive positioning. As a result, previously domestic airports have been upgraded to international ones, resulting in significantly increased market shares globally.² Lack of relevant port services can potentially hinder economic growth and development, and as such many governments have sought to strengthen ports.

Ports continue to play an important role in the economic status of a country, and their effectiveness can lead to significant economic benefits or failures. As goods and services are continually being sourced from various countries, it has become of global importance that our network of ports be capable of meeting demand. Additionally, any country that wishes to increase its global economic footprint faces the challenge of constructing large, efficient ports for export purposes. Port construction is expensive and often requires the aid of development groups. The World Bank, a large development aid group, assists countries in mobilizing financial resources to improve port and waterborne transportation. They currently estimate investment totals over 1 billion USD, which can be seen by region below, and list 69 projects.³

Africa:

\$148.6 million

East Asia & Pacific:

\$475.9 million

Europe & Central Asia:

\$303.4 million

Latin America & Caribbean:

\$5.73 million

Middle East & North Africa:

\$7.25 million

South Asia:

\$76.5 million



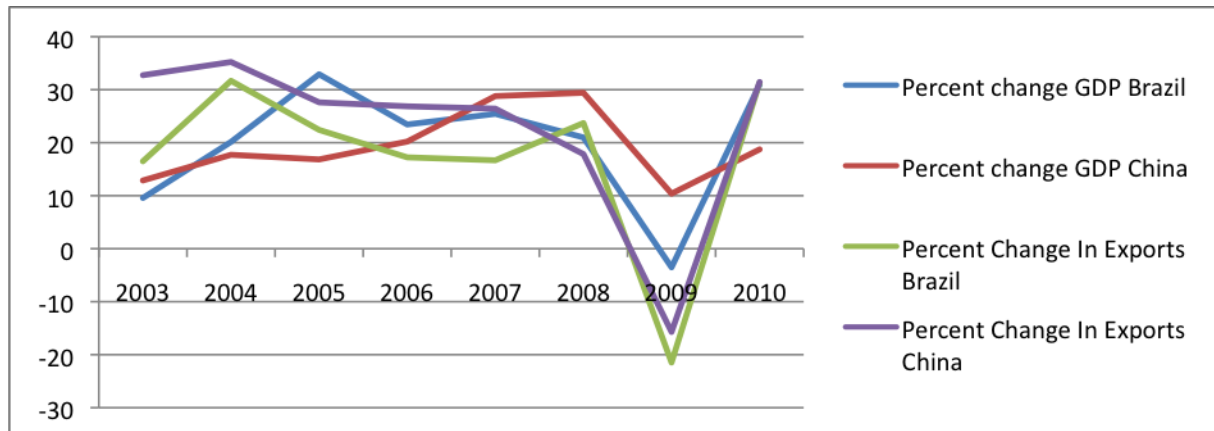
Economic Consequences

¹ Low, Joyce, Shao Lam, and Loon Tang. "Assessment of Hub Status Among Asian Ports from a Network Perspective." *Elsevier* (2009). Print.

² Leishout, Rogier, and Hidenobu Matsumoto. "New International Services and the Competitiveness of Toyko International Airport." *Elsevier* (2011). Print.

³ The World Bank, Ports and Waterborne Transport, Financing: <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTTRANSPORT/EXTPRAL/0,,contentMDK:22343179~menuPK:7987521~pagePK:210058~piPK:210062~theSitePK:338594,00.html>

Exports have a profound effect on a country's GDP. When comparing the change in percentage of China and Brazil's GDP and exports, there is a consistent trend that suggests a link between the two sets of data. Port efficiency, which ultimately affects total exports, is important when attempting to increase GDP. This is illustrated by the graph below, which charts percentage change in GDP and Exports for China and Brazil from 2003-2010.



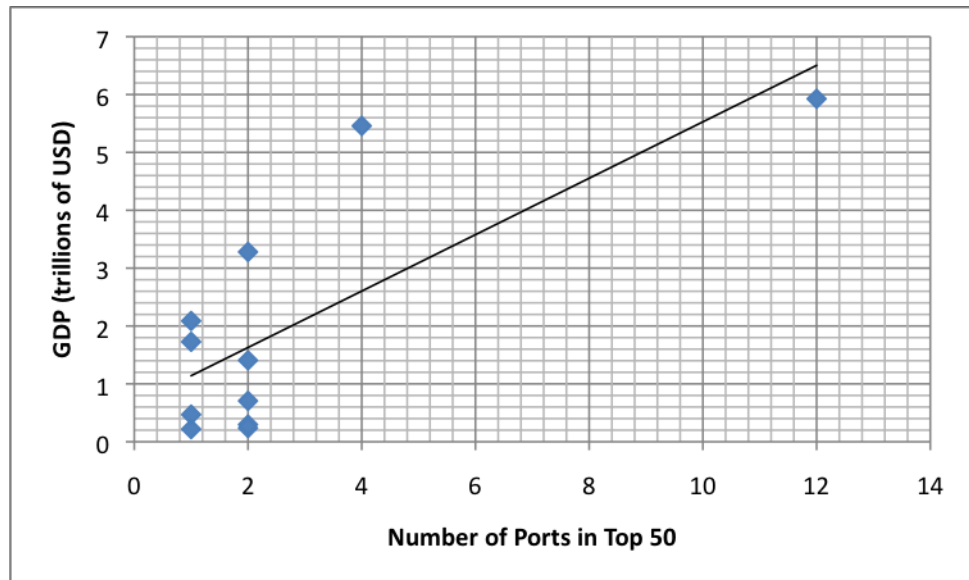
Countries with more efficient and/or numerous ports also tend to have higher overall GDP. China has 12 ports listed in the "Top 50 World Container Ports" ranking by the World Shipping Council in 2010⁵, where as Brazil only has one. Interestingly, China's GDP (5.926 trillion USD) was more than twice that of Brazil (2.087 trillion USD) in 2010.⁶ This trend is also prevalent in other countries.

⁴ The World Bank, Data: data available was manipulated in Excel in order to generate percent changes for each data set <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>, <http://data.worldbank.org/indicator/NE.EXP.GNFS.CD>

⁵ The World Shipping Council, Top 50 World Container Ports:

<http://www.worldshipping.org/about-the-industry/global-trade/top-50-world-container-ports>

⁶ The World Bank: GDP (current US\$): <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>



By examining the scatter-plot above, it can be determined that there is a positive trend in this relationship. That is, the greater number of highly recognized ports in a country, the higher the GDP. This information does not take into account the size of respective ports, which may have a positive or negative effect on the amount of goods that can be exported.

Latin American Ports

One of the most well recognized ports in Latin America is in Santos, Brazil. It ranks as number 44 out of 50 according to the World Shipping Council.⁸ In 2010, 2.72 million TEUs⁹ of goods were processed through this port. It continues to increase the amount of goods processed annually, and has strong ties throughout the world as a shipping hub.

When it was created, there were significant environmental concerns associated with dredging and other factors.¹⁰ Unfortunately, lasting damage did occur as a result of the construction of this port. Many environmental groups continue to reach out to port construction and upgrade project groups in order to mitigate future environmental harm.

⁷ Data from the World Shipping Council <http://www.worldshipping.org/about-the-industry/global-trade/top-50-world-container-ports> and The World Bank was used to generate this scatter-plot.

⁸ The World Shipping Council, Top 50 World Container Ports:

<http://www.worldshipping.org/about-the-industry/global-trade/top-50-world-container-ports>

⁹ TEU: 'Twenty-foot Equivalent Unit'. This is the industry standard to measure containers. A 20-foot container's dimensions are twenty feet long (6.09 meters), 8 feet wide (2.4 meters) and 8 feet six inches high (2.6 meters).

¹⁰ Torres R, Abessa D, Mozeto A, et al. Effects of dredging operations on sediment quality: contaminant mobilization in dredged sediments from the Port of Santos, SP, Brazil. *Journal Of Soils And Sediments* [serial online]. January 1, 2009;9(5):420-432. Available from: GeoRef In Process, Ipswich, MA.

A study conducted concerning this particular port indicated that with increased port efficiency, Santos has the potential to experience an achievement of international standards, efficiency gains associated with decentralization in port management, and regionally differentiated increases in port efficiency to reach the boundary of the national efficiency frontier.¹¹ As suggested by the aforementioned study, ports have the potential to operate far above their current level of efficiency, and management should continue to work to reach higher levels.

Asian Ports

Asia is home to a multitude of ports, which process and distributes goods globally. One of the most recognized ports is located in Shanghai, China, and was ranked 1 out of 50 by the World Shipping Council.

The Port of Shanghai in China processed 29.07 TEUs of goods in 2010.¹² This impressive port is operated by the Shanghai International Port Group (SIPG), which controls and facilitates access to oceangoing commerce in Shanghai.¹³ There are also a plethora of distribution centers that aid in the processing of goods.

Construction of this massive port did not come without certain costs, including environmental damage to the riverbed and surrounding area.¹⁴ When determining port locations, it is important to minimize damage to the ecosystem while maximizing the port's locational advantages. By consulting with environment experts prior to the implementation of this project, many delays and waste of resources might have been avoided.

Predictions of Future State and Recommendations

Port services are largely dependent upon fuel prices, and as a result will become less cost efficient as fuel prices continue to increase. Ultimately, ports will need to determine what alternative resources can be used to power their large transportation networks. In a cost-benefit analysis of using biodiesel as an alternative fuel study, biodiesel was recommended as an alternative to petroleum diesel due to its "superior fuel properties and lower pollutant emissions."¹⁵ This may be a temporary substitute to petroleum fuel due to the large quantity needed and negative environmental externalities in processing it. At the moment, there are not

¹¹ Haddad, E. A., Hewings, G. D., Perobelli, F. S., & dos Santos, R. C. (2010). Regional Effects of Port Infrastructure: A Spatial CGE Application to Brazil. *International Regional Science Review*, 33(3), 239-263.

¹² The World Shipping Council, Top 50 World Container Ports: <http://www.worldshipping.org/about-the-industry/global-trade/top-50-world-container-ports>

¹³ "Shanghai International Port (Group) Co., Ltd." (n.d.): *Hoover's Company Profiles*, EBSCOhost

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¹⁵ Cherng-Yuan Lin & Tsan-Huang Huang. Cost-benefit evaluation of using biodiesel as an alternative fuel for fishing boats in Taiwan. *Marine Policy*, doi:10.1016/j.marpol.2011.04.002

any long-term alternatives to current fuels, so the transportation industry remains unfortunately linked to oil/corn prices.

Another concern for most ports is aging. If systems are not continuously updated, they face the threat of becoming obsolete and eventually too inefficient to run. As a result, port owners need to constantly reserve funds for upgrades and maintenance costs. Due to the exorbitant nature of these projects, public-private partnerships are often pursued.¹⁶ Unfortunately, large infrastructure projects often face delays and unexpected cost increases, resulting in the inability to deliver completion by the original deadline or within budget constraints. Increased research into best practices in these endeavors would benefit the partnership greatly, and is a wise investment for contractors and governments alike.

¹⁶ Vining, A. R., & Boardman, A. E. (2008). The potential role of public-private partnerships in the upgrade of port infrastructure: normative and positive considerations. *Maritime Policy & Management*, 35(6), 551-569.