

The aftereffects from the Suez Canal blockage: a brief investigation into supply shortage, container shipping freight rate and oil price

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December 2021

Abstract

Maritime transportation and global trade faced a severe challenge in March 2021 due to the blockage in Suez Canal by an 20,000 TEU ultra large container ship (Ever Given). The blockage continued for about a week and caused significant vessel congestion and costs. The negative impacts did not end immediately after the ship had released, the disruptions from the blockage were continuing and caused the aftereffects on many areas, such as supply shortage, increased container freight rate and the fluctuation of the crude oil price. This paper briefly explored how the blockage affected those three areas and predicted the Suez Canal's threat from the aspect of the fuel price, innovative vessel technologies, and how the Suez Canal has the potential to be replaced by the alternatives.

1. Introduction

The Suez Canal is the key shipping route of Eurasian seaborne trade, and it is the shortest maritime route connecting Europe and Asia. There are approximate 50 container vessels transit though the canal daily and it is about 30% of the world's shipping container volume [1]. The Suez Canal accounts for 12% of global trade [1]. and 10% of total seaborne oil trade [2]. In just one week, the incident caused more than 450 ships [3] to be blocked and triggered a series of the aftereffects. There are three main ships were blocked: container ship, oil tanker and the break bulk ship. This paper is focusing on the aftereffects of the blockage in supply shortage, container shipping freight rate, oil price and alternatives those four areas. Section 2 raised the research questions, and section 3 discusses the questions by using the supportive data, and section 4 is the author's personal prediction of the Suez canal's future by comparing the alternative routes.

2. The Aftereffects

2.1 Supply Shortage

The delay of the ships had the direct impact of the supply shortage. The global supply chain has shown fragility under the impact of the Covid pandemic, and the recovery has been facing a bottleneck. Some

well-known companies like Nike, Costco, Honda, and Samsung have all made the announcement that the supply chain problem is hurting their business in the first quarter of 2021 [4]. The blockage of the Suez Canal has made the supply chain problem even more prominent. Some ships choose to take alternative routes to avoid the traffic in the Suez Canal, and it added the lead time for the delivery/replenish goods, in some cases the lead time could be added to two weeks [4].

What companies were hurt more by the blockage? The answer could be explored by looking at company's supply chain strategy. Supply chain strategy can be categorized into two categories. One is efficient supply chain strategy, and the other one is responsive supply chain strategy [5]. Responsive supply chain strategy is a strategy that responds quickly to demand, and an efficient supply chain aims to have the lowest supply chain cost. Responsive supply chain requires companies to have faster and more flexible production capability than efficient supply chain because their customers are more sensitive to lead time [6], and the reduced lead time can be one of their competitive strategies. Hence, due to the increased lead time from the blockage, it hurts the most to the companies which implements the responsive supply chain strategy. Those companies are more likely producing innovative products, like Cars, laptops etc., and implement make to order (MTO) and assemble to order (ATO) production strategy.

This theory is confirmed by the data found by Dun & Bradstreet data company from E2open map. Those data track the shipping vessels and materials that transit through the Suez Canal from both west and east countries. According to the data, the top 10 industries that will be affected the most in Europe are: automotive repair services, construction, food retailers, chemicals and allied product-related businesses, health services, industrial and commercial machinery and equipment, metal production, eating and drinking establishments and wholesale trade [7]. In the United States(Fig 1&2), the top 10 industries will be affected are: auto and home supply stores, hardware stores, surgical and medical equipment suppliers, plumbing, heating and air-conditioning, semiconductor, grocery stores, department stores, general warehousing and storage, trucking and sporting goods [7]. Most of the industries in the list are ATO/MTO industrial companies and implementing a responsive supply chain strategy.

Fig 1: Impacted Cargo for Westbound Shipping Lanes



Fig 2: Impacted Cargo for Eastbound Shipping Lanes



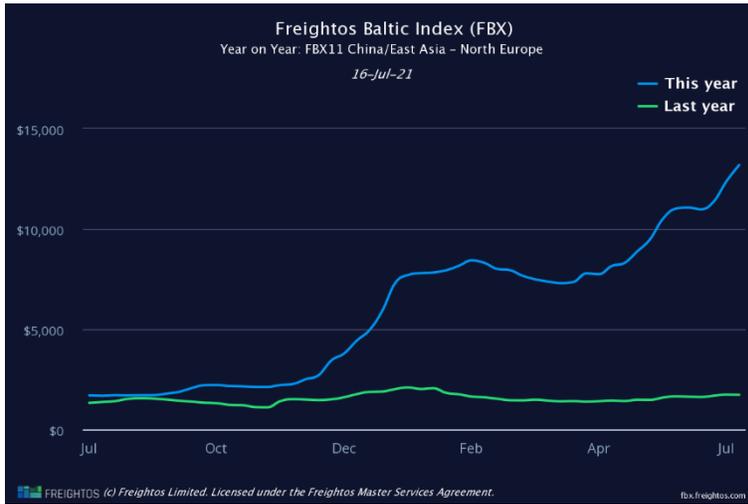
Using the car industry as an example. Most of the car manufacturers implement the just-in-time theory for their inventory management, which is also a responsive supply chain strategy. This implementation pulls the inventories as needed and maintains the minimum inventories. Therefore, any major delays in delivery could delay the production lines. The global automotive supply chain is currently at a very sensitive stage. The shortage of semiconductors and petroleum-based materials from COVID have already put car manufactures' supply chain in crisis [8]. With the delay of the Suez Canal, the crisis can be even greater. Car manufactures and buyers have made their effort on inventory and risk management. One spokesman from KIA said they are aware of the delays and will keep monitoring the situation and take appropriate response depending on the time to free the Ever Given [8]. Other manufacturer like Caterpillar, the world's largest machinery manufacturer, even used air freight to complete the delivery when necessary.

Like every coin has two sides. On the bright side, the public society feels the importance of shipping, the fact that the world relies on the shipping industry to maintain a normal supply of goods has been magnified by the Suez Canal incident. This may be the only positive effect brought by this incident.

2.2 Container Shipping Freight Rate

There is about one-third of the world's container ships pass through the Suez Canal daily, and the main routes are China/East Asia to North Europe, China/East Asia to Mediterranean and the reverse routes accordingly. The container shipping freight rate have been rapidly increasing since November 2020 because of the increased amount of the trade and the container shortage, with the impact of Suez Canal blockage, the freight increase is even higher. According to the Freightos Baltic Index (FBX)[9], a global container freight index(Fig 3), the containers freight from China/East Asia to Europe have soared to \$13,000 USD per container, which is six times more the price a year ago. Similarly, the freight rate from China/East Asia to Mediterranean have also soared to \$12,000 USD per container.

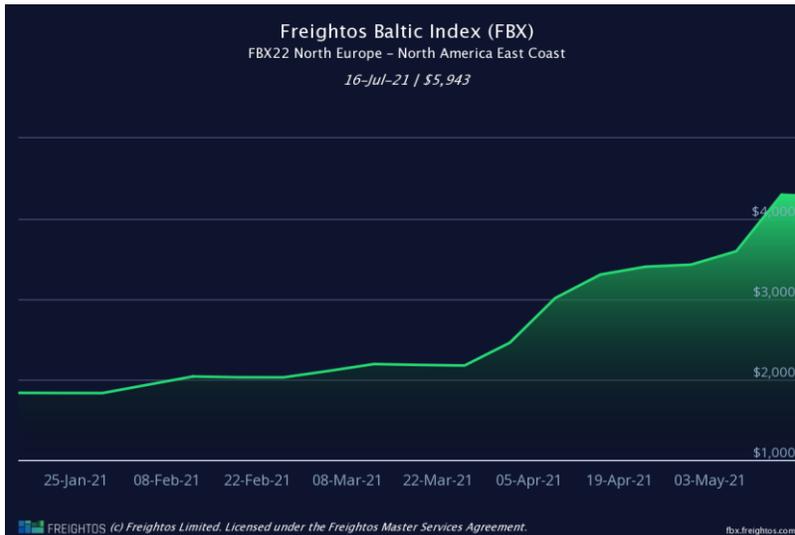
Fig 3. Freightos Baltic Index



Source:FBX (container freight index): China/East Asia to Europe, Bloomberg

The blockage (Fig 4) was not only affecting the freight rate from China/East Asia to North Europe and China/East Asia to Mediterranean, but also affected the freight rate globally. For example, the freight rate of North Europe to North America East coast and Europe to South America East coast increased double from end of March to May 2021. Even if one were investigating the vastly different shipping routes, they will find the effects of this freight rate increase was felt by all.

Fig 4. FBX: North Europe to North America East Coast.



Source: Bloomberg

2.3 Oil price

There are 10% of total seaborne oil trade transported through the Suez Canal [2]. Although the congestion has alleviated within a week, it was still enough to cause bullwhip effects and have an adverse impact on the global energy supply chain. The reason for that is European and American refineries are heavily relying on the Suez Canal to transport oil from the Middle East [9]. Even though the blockage was in a short term, the importers still had to find alternative supplies or seek the alternative shipping route, thereby rose the price of alternatives.

Fig 5:U.S WTI & Brent crude Oil Price (Jan- Jul)



Source: Trading Economics

The linear graph (Fig 5) exhibited two benchmark crude oil prices for the future contract: U.S West Texas Intermediate crude (WTI) and Brent crude[10], both of their prices experienced an obvious fluctuation when the ship was still stocked in the canal. The graph exposed a climbing number one days after the blockage. WTI’s price rose 4.12% and finished at \$60.97 per barrel, and 4.23% increase for Brent and reached \$64.57 per barrel [2], but the prices also dropped around 3% a day later. Both of them were bouncing back and forth during the blockage but have gradually risen for 4 months afterwards.

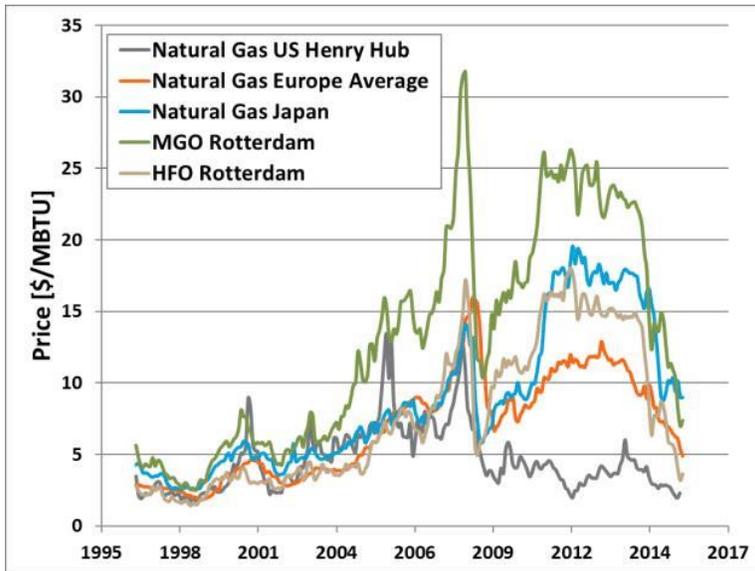
3. Alternatives

Two alternatives have raised the attention from the public that compare to the Suez Canal. One is the Cape of good hope, and the other is the One Belt One Road (OBOR) initiative from China.

For the Cape of good hope, if a vessel travels from Asia to Europe, a detour around the Cape of Good Hope in South Africa will add 6000 miles and at least one week of time [11] . The additional mile also means the extra fuel cost. Both time cost and the fuel cost are the two main reasons that ship line companies choose to pass through Suez Canal. Hence, if either fuel or time cost is no longer a consideration, Suez Canal will start to lose its competitive advantage. The data from World Bank (Fig.6)[14]shows a declining price for vessel fuels in the recent years, Also, with the awareness of the environmental impact of shipping, shipping companies have been putting the effort to the technologies

of reducing the fuel, like the current slow steaming, and the future zero emission vessels. Hence, with the decreasing fuel price and the ship innovations, there will be more shipping companies to choose the cape of good hope instead of the Suez Canal.

Fig.6 Fuel Prices (1997-2015)



Source: Word Bank

As we mentioned earlier, time and fuel costs are the reasons that shipping companies choose the Suez Canal. For the time being, China’s one belt and one road initiative dedicates the railway building and trade between Asia and Europe in order to improve the shipping efficiency [12]. High-speed railway projects are already at completion [13]. It is not hard to predict that OBOR will be a threat for the replacement of the Suez Canal if compared for the efficiency.

4. Conclusion

This paper has discussed three aftereffects from the Suez Canal blockage and predicted the Suez Canal’s future from the aspect of the fuel price, innovation technology and the alternatives routes. The main conclusions in this article are:

- a. A company which implements a responsive supply chain strategy will hurt more from the blockage than a company which implements an efficient supply chain strategy.
- b. Container freight rates have a rapid increase globally due to the blockage and affects the container from Asia to Europe/Mediterranean the most. Asia to Europe have soared to \$13,000 USD per container and Asia to Mediterranean have also soared to \$12,000 USD, which is six times more the price a year ago.
- c. The crude oil prices have an obvious fluctuation during the blockage and have gradually risen for 4 months afterwards. However, this research paper only explored the fluctuation, and further research is needed to explore if the increased oil prices were caused by the blockage.

d. The decreased fuel price and the innovative vessel technologies (slow steam, zero emission vessels, etc.) will decrease the needs for ship line companies choosing the Suez Canal, instead, they will choose to pass through the Cape of good hope for economic reasons. And China's OBOR initiative also will be a threat for the Suez Canal if compared for the efficiency.

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