

Original article

Effect of the Northern Sea Route Opening to the Shipping Activities at Malacca Straits

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Abstract

The opening of the Northern Sea Route as an alternative route for transporting cargoes between the Far East and Europe seems highly acceptable by shipping companies due to the great saving in fuel consumption, bunker cost, operating cost, emissions and journey time. This situation will not only affect the maritime business activity in the Straits of Malacca but also, the Malaysian economy in different perspectives when the vessels sail via the Suez Canal and the Indian Ocean are expected to decrease. The objective of this study is to analyse the implication in the opening of the Northern Sea Route on Maritime Sector of the Malaysian economy by using PESTEL analysis. The main scope is focusing more on the Malacca Straits shipping activity by using a number of parameters that have been obtained from Port Klang and Port Klang Authority through a set of questionnaires and interview sessions with industrial experts.

Keywords: Northern Sea Route; Malacca Straits; Maritime Sector; Malaysia Economy; PESTEL Analysis; SWOT analysis.

I. Introduction

Malaysia as a leading maritime nation is surrounded by a sea much larger than its land mass. Ports and shipping are recognized as essential contributors to facilitating Malaysia's trade, hence crucial to its economic prosperity. In 2008, the country's total trade was valued at US\$335 billion, an increase of 6.8 percent from 2007. Exports rose by 9.6 percent to US\$187 billion, while imports increased by 3.3 percent to US\$147 billion, resulting in a trade surplus of US\$40 billion (Khalid, 2009). According to Khalid (2007), Malaysia has emerged as one of the world's most significant maritime nations, but not all activities in the maritime sector in the country are conducted in line with the concept of sustainable development. The particular emphasizes on major aspects which should be given attention to with the stakeholders in the effort to introduce the philosophy of sustainable development in the local maritime sector. It underlines the need to heed environmental protection in developing maritime infrastructures such as a port in the advancement of maritime economic activities such as transportation, fishery and offshore oil and gas exploration and production. The set of initiatives recommended in the articles gives strategic focus to maintaining harmony between the Malaysia maritime environment and those involved in the maritime industry. It also takes into account the legal framework and the economic interest of the stakeholders in the sector toward finding convergence between exploiting the nation's maritime riches and protecting the integrity of the maritime environment in line with the concept of sustainable development.

II. Literature Review

2.1. The Importance of Malacca Strait

The Straits of Malacca is an international navigation waterway and is crucial in the world of trading whether for international trade or local trade (Singapore Journal of International & Comparative Laws, 1998). According to IMO (2003) more than 60,000 ships pass through the Straits of Malacca every year by carrying various cargoes, from raw materials to finished products from all over the world (Forbes, 2004) and 80% of vessels passing through the Straits annually carry oil to Northeast Asia (Gilmartin, 2008). The Malacca Straits is one of the most important shipping waterways in the world from both an economic and strategic perspectives (Gilmartin, 2008).

Figure 1 shows that the total number of vessels navigating to the east-bound region from the west-bound region and vice versa that is reported to Marine Department of Malaysia, from year 2000 until 2012. The total number of vessels navigating through the Malacca Straits increased from 2000 to 2008 with a slight decrease in 2005. The total percentage of vessel across the Malacca Straits from 2004 to 2005 decreased by 8.15% from 26871 units in 2004 to 24584 units in 2005 due to the lack of security in the Straits. Safety of navigation focuses on issues of security, loss of life, property and environmental protection. Due to cases of piracy, shippers take other

alternative, longer route, to avoid navigating through the Malacca Straits. Result shows, decreasing in number of vessel from the east region to the west region. Therefore managing and reducing risks in the Straits will require concerted efforts among user and bordering littoral states. After the Malaysian Maritime Enforcement Agency (MMEA) was introduced in May 2004, the percentage of vessels crossing the straits increased by about 10.23% from 24584 units in 2005 to 27100 units in 2006 and the piracy cases was decreased in 2006.

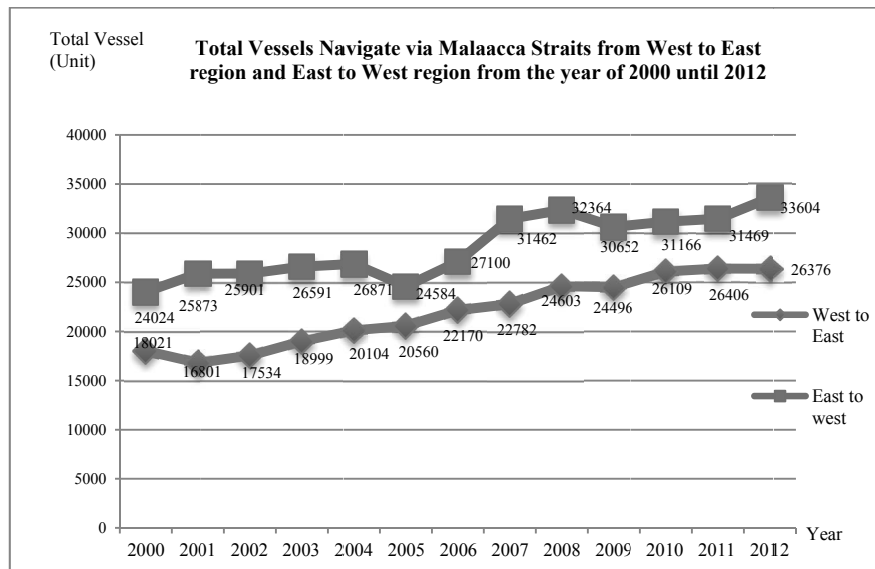


Figure 1: Vessels crossing Malacca Straits from year of 2000 until 2012

2.2. Opening of Northern Sea Route

Global climate change is offering new opportunities for international transportation networks, notably with a trend of receding ice around the North Pole. If this trend continues parts of the Arctic could be used more reliably for navigation, at least during summer months and for longer periods of time. The main trans-Arctic routes include the Northern Sea Route (NSR) and the Northway Passage. The Northern Sea Route along the arctic coast of Russia is the maritime route that is likely to be free of ice and would reduce the maritime journey between East Asia and Western Europe from 21,000 km using the Suez Canal to 12,800 km, cutting transit time by 10-15 days (Paul Rodrigue, 2013) and The Northwest Passage crossing Canada's Arctic Ocean could become usable on a regular basis by 2020, lessening maritime shipping distances substantially. The maritime journey between East Asia and Western Europe would take about 13,600 km using the Northwest Passage, while taking 24,000 km using the Panama Canal (Paul Rodrigue, 2013).

According to Halvor Schoyen and Svein Brathen 2010, studies about benefits achievable through energy efficiency improvements due to a shorter route (the NSR) might offset the disadvantages caused by uncertainty linked to both the NSR and the route via the Suez Canal. The difference in navigational distance from North West Europe (London) to Far East (Yokohama) is 4,200 nm, which for 15 knots sustained speed equals a difference in time at sea of about 12 days, all other factors being identical for the two routes

According to the Congressional Research Service report, China runs a trade surplus with the world's three major economic centres: 1) The United States, 2) The European Union, and 3) Japan. Since 2000, the United States has incurred its largest bilateral trade deficit with China (\$201 billion in 2005, a 25% rise over 2004). In 2003, China replaced Mexico as the second largest source of imports for the United States. China's share of U.S. imports was 14.6% in 2005, although this proportion still falls short of Japan's 18% of the early 1990s. The United States is China's largest overseas market and second largest source of foreign direct investment on a cumulative basis. U.S. exports to China have been growing rapidly as well, although from a low base. In 2004, China replaced Germany and the United Kingdom to become the fourth largest market for U.S. goods and remains the fastest growing major U.S. export market. China is purchasing heavily from its Asian trading partners particularly in precision machinery, electronic components, and raw materials for manufacturing. China is running trade deficits with Taiwan and South Korea and has become a major buyer of goods from Japan and Southeast Asia. This scenario shows that the active trade activity between Europe and Far East and Far East to Pacific.



Figure 2: China's New Shipping Frontier

Source: Northern Sea Route Information Office; National Snow and Ice Data Center; Cosco; Lloyd's List (2013).

Figure 2 shows the comparison between two maritime routes for transporting cargoes from the Far East to Europe. The shortest route to travel from China to Rotterdam is by using the NSR which can save up to 13 days. The philosophy applied in the shipping industry is the reduction in route distance will automatically reduce the total travel time, ultimately reducing the total fuel consumption, bunker fuel cost and vessel operating cost respectively. Consequently, the amount of emissions produced by ships will definitely be reduced. Finally, the shipping companies' profit margin will dramatically increase without any argument.

2.3. Current Shipping Routes versus Alternative Routes

“The Northern Sea Route” by Claes Lykke Ragner¹, 2008 states that the NSR can offer great savings in distance and thus potentially also in time and expenses for transport between Europe and East Asia, with no countries being more conveniently located than the Nordic ones. In theory, distance savings can be as high as 50% compared to using the current shipping lanes via Suez or Panama Canal.

Researchers are studying the benefits of the NSR from Europe to the Far East without using the Suez Canal. The Malacca Straits will be affected because the current route from Europe to the Far East using the Suez Canal passes through Malacca Straits. Therefore, this paper studies the effect to Malacca shipping activities when the NSR officially opens.

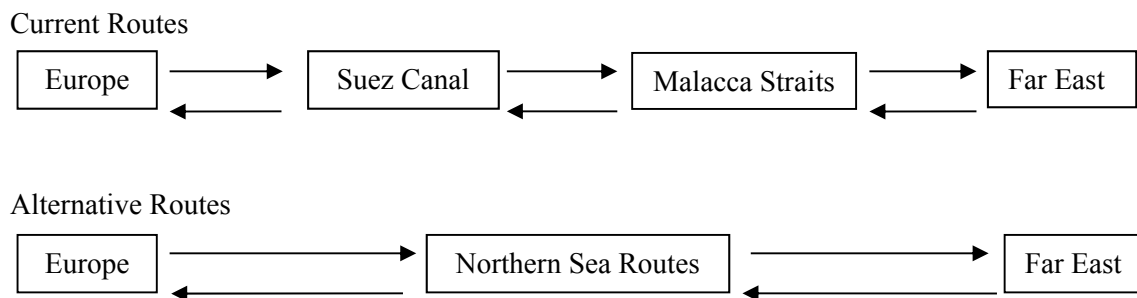


Figure 3: Current Shipping Routes versus Alternative Routes

Figure 3 shows that currently, cargoes are transported between Far East and Europe depends on the shipping route via Suez Canal which is located in Egypt. The canal was officially opened to the maritime transportation industry in November 1869 (Suez Canal Authority, 2013) and the length of the canal is 101 miles (163 kilometres) that connects the Mediterranean Sea with Gulf of Suez, Red Sea (Suez Canal Authority, 2013). By crossing the Suez Canal and Indian Ocean as a medium of connection between Far East and Europe, all ships will pass by the Malacca Straits and the highly potential ports to be the port of call are Northport and Westport of Port Klang. However, if shipping companies decide to use the NSR as the alternative route for transporting cargoes from and to both regions, the shipping activities and economics at the Straits of Malacca will definitely be affected. Table 1 shows the comparative study between both shipping routes. Obviously the NSR is classified as the best route for transporting cargoes from Asia to Europe. Thus, maritime activity at Malacca Straits will be affected when some shipping companies chose to navigate via NSR as the alternative maritime route due to the time and cost saving factors. Eventually, if the total number of ships crossing the Suez Canal decreases, the total number of ships crossing the Malacca Straits will also decrease.

Table 1: A comparative of two shipping routes for the Asia-Europe trade

Element	Maritime Routes (via)		Statement
	Suez Canal (SC)	Northern Sea Route (NSR)	
Distance (nm)	11585	7356	[Far East vs. N.W. Europe] Yokohama - Hamburg Suez Route (11,585 N.M.) vs. NSR Route (7,356 N.M./-36%) The navigation distance from Northwest European port to Far East via NSR is an approximately 36% shorter compared Suez Canal route.
Fuel Consumption	High	Low	Norway to China: Shipping via the NSR save \$550,000 in fuel costs compared to the journey via Suez Canal (Bulk Ship named MV Nordic Barents)
Journey Time	32 days (15 knots)	18 days (15 knots)	North West Europe (London) to Far East (Yokohama) Shipping via the NSR save 14 days on the journey compared to via the Suez Canal by using same speed
Speed (Knots)	15 knots 32 days	9 knots 32 days	North West Europe (London) to Far East (Yokohama) Shipping via the NSR using speed only 9 knots on the journey compared to via the Suez Canal by using 15 knots on speed
Piracy	Yes	No	There is also much reduced level of piracy through this northern route, compared to the risk of piracy for ships in the Indian Ocean that are using the Suez Canal
Fee	Low	High	A maritime route with transshipment (T/S) includes T/S charges at T/S ports. NSR Fee USD 674 per TEU Suez Canal Fee (SDR/GT) for the 1 st 5,000GTx USD7.88+ 2 nd 5,000GTx USD5.15+; 3 rd 10,000GTxUSD4.12+; 4 th 20,000GTxUSD2.88+; 5 th 30,000GTxUSD2.6+ 70,000GT(+)xUSD2.11
Transport Cost	High	Low	North West Europe (Hamburg) to Far East (Yokohama) Transport cost via NSR (USD/TEU) <1,123 Via Suez Canal (USD/TEU) 1,299
Cost Saving	Low	High	Cost analysis may heavily depend on changes of bunker oil and ship-building prices as well as NSR, and Suez Canal fees. Thus, the shipping scenarios including navigation conditions would be a key factor to the cost analysis here. Severe competition will be expected among NSR and Suez Canals in the near future

III. The Implication in the Opening Northern Sea Route to Maritime Sector of Malaysia Economy

PESTEL analysis

The PESTEL framework is designed to provide managers with an analytical tool to identify different macro-environmental factors that may affect business strategies, and to assess how

different environmental factors may influence business performance now and in the future (Johnson et al, 2008). The PESTEL Framework includes six types of important environmental influences: political, economic, social, technological, environmental and legal.

PESTEL analysis is a simple and effective tool used in situational analysis to identify the key external (macro environment level) forces that might affect an organization. Therefore, the aim of using PESTEL in this paper is to identify the external factors that may change the maritime shipping activity in the Malacca Straits, consequently affecting the economy of the maritime sector of Malaysia.

According to the PESTEL analysis, it could help this paper to determine the implications in the opening of the Northern Sea Route to the maritime sector of Malaysia into different perspectives that are related to this study.

Below some characteristic of PESTEL analysis:

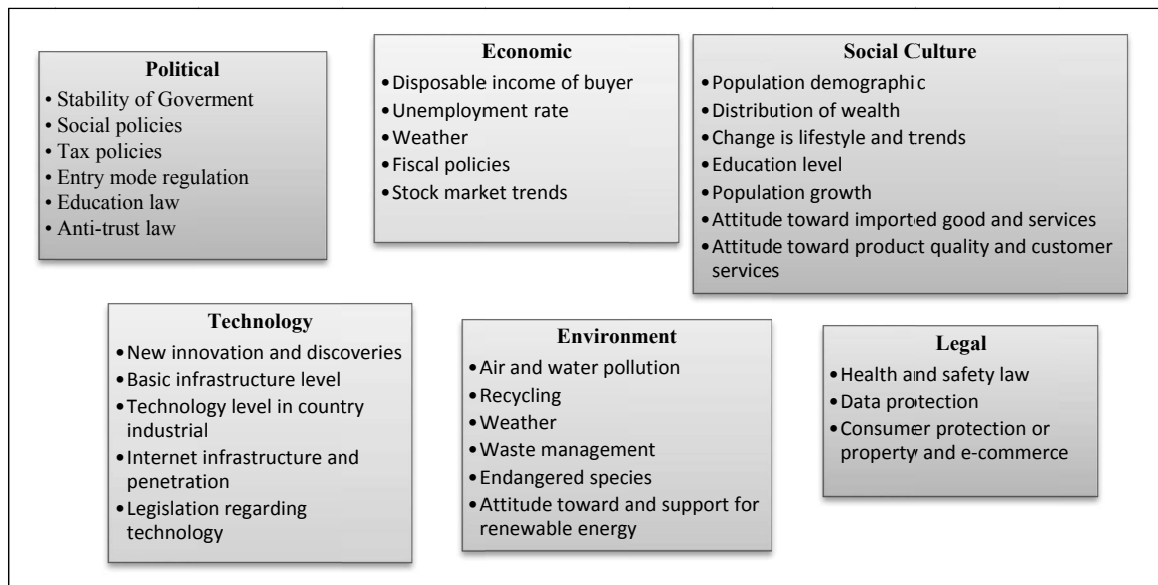


Figure 4: PESTEL analysis template

Source: Business Mate.Org; Great Business Resources

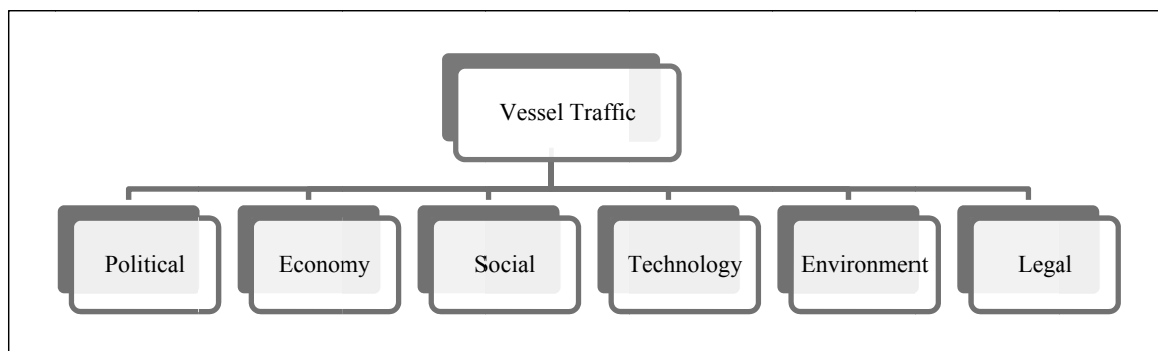


Figure 5: Conceptual Framework of the Implication in the Opening Northern Sea Route to Maritime Sector of Malaysia Economy

By using PESTEL analysis the implication in the opening of the NSR on maritime sector of Malaysian economy has been categorised into six factors 1) Political, 2) Economic, 3) Social, 4) Technology, 5) Environment and 6) Legal. Some of the implications give positive impacts or positive benefits which tend to be laudable to the maritime sectors. Vice versa, negative impacts to the Malaysian economy will have disadvantageous impact to community or surrounding environment. Based on Figure 4, the increase or decrease in the total number of vessel traffic across the Malacca Straits will automatically have an effect on maritime sector of Malaysia economy. Further detailed explanation of each element is discussed in Sections 3.1 through 3.6.

3.1. Political

Political factor is basically to what degree the government intervenes in the economy. Specifically, political factors include areas such as stability of the government, social policies, tax policies, entry mode regulation, education law and anti-trust law. Political factors may also include goods and services which the government wants to provide or be provided and those that the government does not want to be provided. Furthermore, governments have great influence on the health, education, and infrastructure of a nation. In this study, the parameter that was determined is the stability of the government. In Peninsular Malaysia, some of the key industries include rubber, oil palm processing and manufacturing, light manufacturing, pharmaceuticals, medical technology, electronics, tin mining and smelting, logging, and timber processing. The Eastern Malaysian states of Sabah and Sarawak are keenly focused on logging, petroleum production and refining and agricultural processing. Currently, Malaysia is stable with this entire industrial player and the government is committed to providing seamless and efficient maritime cargo transportation infrastructures and services. If the number of vessels navigating in the Malacca Straits is reduced, Malaysian economy will definitely be affected tremendously.

3.2. Economy

Based on PESTEL analysis, economic factors include disposable income of buyers, unemployment rate, weather, fiscal policies and stock market trends. These factors have major impacts on how businesses operate and make decisions. The exchange rates affect the costs of exporting goods and the supply and price of imported goods in an economy. There are a variety of modern definitions of an economy. Some of the differences may reflect evolving views of the subject or views among economists (Backhouse et al, 2008). Scottish philosopher Adam Smith (1776) defined political economy as “an inquiry into the nature and causes of the wealth of nations.” Economic factors include economic growth, interest rates, exchange rates and the inflation rate. These factors have major impacts on how businesses operate and make decisions. For example, interest rates affect a firm's cost of capital and therefore the extent a business can grow and expand. Exchange rates affect the costs of exporting goods and the supply and price of imported goods in an economy. This study focused on six parameter 1) employment rate 2) business trade 3) vessel traffic 4) ship call 5) port profit and 6) country income. Ship call is the total number of ships that go to the port for unloading and loading cargo. Port of call is more

about the ship port and arrival. According to Ministry of Transportation (2012) the total number of ship calls at Port Klang (Westport and Northport) has increased year by year starting from year 2000 until 2003 but decreased in 2004 and 2005 by almost 6.77% and 0.66% respectively from 15,150 unit vessel to 15,050 unit vessels. Malaysia ports act as gateways for the economy and facilitate much of the nation's trade, 95% of which is carried by seaborne transport. Together, ports and the shipping sector generate tremendous multiplier effects and create employment opportunities for many. The importance of port to nation 1) a vital aspect of a national transport infrastructure 2) main transport link with their trading partner in a focal point for motorways and railways system and 3) a major economic multiplier for nation's prosperity like a gateway for trade, attract commercial infrastructure and industrial activity. If the ships sailing via the Malacca Straits are reduced, the Malaysia economy will be negatively affected.

3.3. Social

Social factors include the cultural aspects like population demographic, distribution of wealth, change of lifestyle and trends, education level, population growth, attitude toward imported goods and services and attitude towards product quality and customer service. Trends in social factors affect the demand for a company's products and how that company operates. For example, an aging population may imply a smaller and less-willing workforce (thus increasing the cost of labour). Furthermore, companies may change various management strategies to adapt to these social trends (such as recruiting older workers) (Johnson et al, 2008). As known, the major import export goods and services in Malaysia are transported by sea. The products in Malaysia, like car, clothing and electrical goods are imported from other country because of the quality and the customers liking for imported goods. If the total number of vessels that transport imported goods decreases, the customer satisfaction or attitude towards imported product becomes lower.

3.4. Technology

Technological factors include technological aspects such as new innovation and discoveries, basic information level, technology level in industry, internet infrastructure, and penetration and legislation regarding technology. They can determine barriers to entry, minimum efficient production level and influence outsourcing decisions. From the technological perspective, in this paper, two parameters will be affected when the total number of vessels plying across Malacca Straits is reduced, i.e. 1) basic infrastructure level and 2) technology level in industry. The Transport Minister of Malaysia, Dato' Seri Kong Cho Ha stated that Malaysia has excellent port infrastructures and good maritime institutional and regulatory framework, Malaysia is poised to grab a bigger slice of intra-ASEAN and intra-Asian trade which present lucrative trades for our ports and shipping lines. With AFTA set to become a reality by 2015, Malaysia's ports, some of which offer world-class services at very competitive cost, are set to reap the opportunities presented by a huge and integrated regional market. The improvement of technologies will be upgraded when more competitors enter the same industry. Each company will upgrade their technologies or facilities to attract more customers. If the number of vessels passing through

Malacca Straits is reduced, the port service level and the technology level in the industry will remain unchanged.

3.5. Environment

Environmental factors include ecological and environmental aspects such as air and water pollution, recycling, weather, waste management, endangered species and attitude toward support for renewable **energy** which may especially affect industries such as trade and tourism. Environment means the physical factors of the surroundings of human being including land, water, atmosphere, climate, sound, taste, the biological factors of animals and plants (Environment Quality Act, 1974). On the scope of environment, there are two parameters involved 1) ship collision and 2) emission. Both parameters brought the environment risk which means risk, hazard or chances of bad consequences that may be brought upon the environment (Law of Malaysia, 1974). According to Tsz Leung Yip, (2006) port traffic risks are of certain pattern and vessels collision are the most popular incidents when port traffic is heavy. De and Ghosh (2003) evaluated the relationship between port performance and port traffic in the context of India by applying the unit root tests, co integration tests and Granger causality tests and found that a port with better performance (e.g., higher productivity) is likely to get higher traffic. From 2000 to 2012, Marine Department, Malaysia reported that between these years, there are an average number of 7 marine accidents per year in the Malacca Straits. In 2010, the highest total number of vessel accidents recorded is as many as 15, and around 46% of the total number of accidents was caused by the disunity between the two vessels. Hanizah Idris, (2001) estimated that for every two or three minutes, there is at least one vessel passing by the Malacca Straits. Ship collisions caused by navigational negligence could contribute to oil spills which in turn affect the marine life. The solution to decrease the number of oil spills is to reduce the number of accidents. The threat of ship-based pollution looms large with the increase risk of ship accidents as a result of increasing traffic in the Straits. Over the years, several incidents have occurred in the Straits involving ships releasing oil, hazardous and noxious substance (HNS) into the waters. If the ships that sail via Malacca Straits decrease, the number of ship collision incidents will surely be reduce.

3.6. Legal

Legal factors include health and safety law, data protection and consumer protection or property and e-commerce. The legal implication that Malaysia would face include 1) piracy and 2) safety and security. According to International Maritime Organization (IMO), a specialized agency within United Nations, "piracy" is defined as violence on the high seas or exclusive economic zones. It may not occur in territorial seas, archipelagic waters or internal waters. Malaysia is one of the key players in the Straits of Malacca security debate because almost half of the Straits lies in Malaysian territorial waters. For matters pertaining to policy and regulation, ports in Malaysia are established either as Federal or State Ports under the jurisdiction of the respective governments. Commercial ports and jetties are under the jurisdiction of the Marine Department, whereas fishing ports and jetties are under the jurisdiction of the Fisheries

Development Authority (MIMA, 2013). In Malaysian legal system, all port management and legal activities are under Act 488 Port Authorities Act 1963.

According to the PESTEL theory, it concludes that the implication of opening the NSR to maritime sector has positive and negative implications. Table 2 summarises the information based on both implications. Table 1 determines either positive or negative implication by using SWOT analysis. SWOT is an acronym which stands for Strength; Weakness; Opportunity and Threats (Lawrence G Fine, 2009). SWOT analysis will provide this study with a good foundation for strategy, position and directions, and discover which ideas are worth pursuing. According to Albert S. Humphrey 2005,

- Strengths** : characteristics of the business or project that give it an advantage over others.
- Weaknesses** : characteristics that place the business or project at a disadvantage relative to others
- Opportunities** : elements that the project could exploit to its advantage
- Threats** : elements in the environment that could cause trouble for the business or project

Table 2: The Implicaion of the opening Northen Sea Route to Maritime Sectors of Malaysia

Perspective	Parameter	Positive	Negative	Impact
Political	Stability of Government		/	Reduce
Economy	Employment Rate		/	Reduce
	Business Trade		/	Less Profit
	Ship Call		/	Reduce
	Port Profit		/	Less Profit
	Country Income		/	Less Profit
Social	Attitude Towards Imported Goods and Services		/	Reduce
Technology	Basic Infrastructure Level		/	Normal
	Technology Level in Country Industry		/	Normal
Environmental	Ship Collision	/		Reduce
	Emission	/		Reduce
Legal	Piracy	/		Reduce
	Safety and security	/		Increase
	Policy and regulation	/		Normal

Table 3: The implication in scope of SWOT

STRENGTH	S	WEAKNESSES	W
<u>Legal</u>		<u>Social</u>	
Piracy	Reduce	Attitude Towards Imported	Reduce
Safety and Security	Increases	Good & Services	Reduce
Policy and Regulation	Normal		
		<u>Political</u>	
		Stability of Government	
OPPORTUNITIES	O	THREATS	T
<u>Environmental</u>		<u>Technology</u>	
Ship Collision	Reduce	Basic Infrastructure Level	Normal
Emission	Reduce	Technology Level in Country Industry	Normal
		<u>Economy</u>	
		Employment Rate	Reduce
		Business Trade	Less Profit
		Ship Call	Reduce
		Port Profit	Less Profit
		Country Income	Less Profit

Table 3 shows the output of discussion with experts regarding each element that have a number of criteria between minimum and maximum such as strength; legal, weaknesses, social, political, opportunities; environmental, threats; technology and economy.

The opening of the Northern Sea Route as an alternative route will affect our maritime activities especially in the Malacca Straits. If the total number of vessels navigating in the Malacca Straits decreases, illegal activity such as piracy will be reduced. This situation gives strength to Malaysia as a maritime nation when the level of safety and security is improved. In Malaysia, there are two government agencies that are responsible to carry out enforcement at sea areas i.e Malaysia Maritime Enforcement Agency (MMEA) and Royal Malaysian Navy (RMN). In terms of the political and social perspective, if the total number of vessels is reduced, the government may become unstable due to the political implications which include customer's attitude toward imported goods and services. In similar situation, probability of ship collisions and smoke emissions will also be reduced and thus have a positive impact to the environment. Finally, when there are no new developments of basic infrastructure and technology in place, Malaysia will lose out to other countries that have better port and shipping facilities such as Melbourne Port. At present Melbourne port is capable of having Post Panamax Crane which can easily load and unload high volume of containers (Port Melbourne Authority, 2014).

IV. Conclusions

In all, the opening of the Northern Sea Route as an alternative route for transporting cargoes from the Far East and Europe will affect the maritime sector of Malaysia Economy in scope of 1) political, 2) economy, 3) social, 4) technology 5) environment and 6) legal. This situation will have positive and negative impact on the Malaysia economy especially in the maritime sector. Malaysia economic professional and maritime players should be aware and be prepared for any new business strategic options if this situation continues. Port authorities can no longer be just regulators, administrators and landlords. They have to play a variety of roles, which include marketing, attracting investors, financial planning, business development and even customer relations. They must act as strategic partners to the terminal operators and work in concert to ensure their ports remain highly competitive. All port management and operation in Malaysia need to be systematic, weighing not only economic, geographical and physical factors, but also political factors as well. Further, they need to be reasonably prepared for whatever changes to the industry and to the global economy in general. In terms of National Port Policy and National Port Authority, we suggest a study on the feasibility of establishing a proper national port policy, and even a national port authority. This will have the benefit of harmonizing cooperation between the various Federal ports, improving port planning and development, standardizing procedures and increasing competitiveness with other regional ports.

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