

The Implications of One Belt One Road (OBOR) Strategy on Malaysian Seaport Capacity

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Abstract

Analysis on the implication of One Belt One Road (OBOR) on Malaysian seaport capacity is the main agenda of this paper. OBOR initiative is a win-win cooperation between China and 65 countries around the globe including Malaysia. This initiative connecting Asia, Europe, Africa and the Middle East which comprising two routes including 'Silk Road Economic Belt' and '21st Century Maritime Silk Road'. Some projects that will be develop in Malaysia under OBOR are Malaysia-China Kuantan Industrial park (MCKIP), Melaka Gateway (seaport), East Coast Rail Link (ECRL), and Iskandar Malaysia (industrial park). Currently, Malaysian seaports are facing an imbalance in capacity due to the unpredictable trend in maritime logistics, severe competition with inter/intra regions seaports and preserving a steady momentum in trend of seaport competitiveness. Hence, this research has been conducted to analyse the impact of OBOR initiative on Malaysian seaport capacity and to evaluate the preparation of Malaysia to comply with it. This paper employs quantitative approach via regression analysis to validate the impact of OBOR on seaport capacity especially in peninsular Malaysia. Questionnaires have been distributed to 30 respondents including experts from seaports and their respective clients. Regression analysis has been conducted to evaluate the impact of OBOR on Malaysian seaport capacity proposing substantial preparation for Malaysia to cope with this global plan. The outcome of this paper indicates that the establishment of OBOR will affecting Malaysian containerised trade, seaport infrastructure and hinterland area. Hence, government policy, port expansion, investment, strategic planning, and investment on new equipment need to be revisited to ensure a progression of symbiotic relationship between Malaysia and this global investment plan

Keywords: One Belt One Road, Seaport Capacity, Malaysia, Regression, Imbalance Capacity, Impact, Strategies

Introduction

One Belt One Road (OBOR) has been proposed by Xi Jin Ping, the president of China in 2013. This initiative focuses on connectivity enhancement between 65 countries around Asia, Africa, China and Europe. The objective of OBOR is to promote economic prosperity of the countries along the belt and road in order to strengthen exchanges and mutual learning. Besides, this strategy also aiming to

spur world peace and expedite the development between the countries involved [1]. OBOR initiative consists of two mega plan including the Silk Road Economic Belt and Maritime Silk Road. The ‘belt’ refer to Silk Road Economic Belt which is land based, while the ‘road’ refer to the 21st Century Maritime Silk Road which is sea based and it connects China to South-East Asia, Africa, and Central Asia [2]. The Silk Road Economic Belt plays it role as the mega hinterland for China to connect with other countries from Europe to Central Asia while the 21st Century Maritime Silk Road aiming a fast-growing development in seaports and railways network from South-east Asia region to China’s Southern provinces. Figure 1 shows the route of ‘Silk Road Economic Belt’ and ‘21st Century Maritime Silk Road’.



Figure 1. The connectivity coverage of China via OBOR initiative
Source: CPEC-China Pakistan Economic Corridor in OBOR, 2017.

Due to our strategic location, One Belt One Road plan in Malaysia will only focuses on Maritime Silk Road. It justifies the aim of this paper which will discuss on the implication of OBOR strategy in term of seaport capacity. Seaport capacity refers to draft of seaports, berth length, and facilities of certain seaports to carter cargo by specific operating hours [3].

A study about the impact of OBOR strategy to Malaysian seaport capacity, and how we need to comply with the OBOR strategy are needed. It is required as platform to propose possible policies in order to prepare this region to assimilate with this project which is considered as mega transition of China on strategy, foreign policy and collective development. Therefore, the aim of this paper is to

examine the impact of OBOR to the seaport capacity and to evaluate the preparation of Malaysia towards this initiative.

For data collection and analysis procedures, quantitative approach will be employed. Questionnaires have been distributed to industry personnel especially experts who attached to Malaysian seaports, clients of seaports such as shipping lines and the government agencies.

Seaport Capacity: Malaysian Perspectives

Maritime Silk Road that proposed under OBOR strategy includes Malaysia as one of the 65 participated countries that can make this strategy successful. It is because Malaysia plays an important role in Maritime Silk Road due to strategic location that connecting coastal China to the Mediterranean via Singapore and Malaysia, Hindi Ocean, Arabian Sea and Straits of Hormuz. Major projects that will be constructed under OBOR strategy in Malaysia are including East Coast Rail Link (ECRL), Malaysia-China Kuantan Industrial Park (MCKIP) in Pahang, Malacca Gateway National Maritime Park, and Iskandar Malaysia development in Johor.

At present, Kuantan Port handles bulk cargoes for nearby industrial areas. In order to meet the increasing demand in the future, Kuantan Port is currently expanding its bulk cargo terminal. It is developing a new deep-water terminal (NDWT) which aims to become a container port for trans-shipment cargoes

[4]. Some seaports in Malaysia are facing imbalance in capacity to cater increasing volume of cargo [5]. Figure 2, shows the total container throughput (TEU's) by Malaysian seaports from 2007-2016.

Ports	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<u>Klang</u>	7,118,714	7,973,579	7,309,779	8,871,745	9,603,926	10,001,495	10,350,407	10,945,804	11,886,685	13,209,577
<u>Penang</u>	925,991	917,631	958,476	1,106,098	1,202,179	1,165,733	1,237,713	1,265,712	1,317,352	1,437,120
<u>Johor</u>	927,284	934,767	844,856	876,268	830,340	801,058	757,023	792,501	800,524	827,011
<u>Kuantan</u>	127,600	127,061	132,252	142,080	132,796	136,101	126,548	131,244	140,959	141,639
<u>Tanjung Pelepas</u>	5,297,631	5,466,191	5,835,085	6,298,733	7,302,460	7,493,805	7,416,518	8,232,113	8,798,747	8,280,710

Figure 2. Total Container Throughput (TEU's) by Malaysian seaports (2007-2016)

Source: Ministry of transportation (2017)

Port Klang, Penang Port, and Port of Tanjung Pelepas show an increasing number of container throughput. For example, TEU's handled in port Klang increased from 7,118,714 TEU's to 13,209,577 TEU's in ten years. In Penang port, the volume of container has increased from 925,991 TEU's to 1,437,120 TEU's from 2007 to 2016. The trend is similar in PTP by recording 5,297,631 TEU's to 8,280,710 TEU's in ten years. Johor Port and Kuantan Port show fluctuating trend of container throughput from 2007 until 2016. Most of the seaports facing an increasing number of cargo throughput, while the other facing fluctuated number of cargo throughput.

To study whether seaports in Malaysia is ching it capacity or not, Table 1 shows the current capacity of ports in Malaysia and the container throughput that each seaport handled in 2016. Port Klang and Kuantan Port are facing limited capacity when the containers that have been handled in Port Klang is 13.2 million TEU's while the seaport capacity is 8.4 million TEU's to cater the containers annually. Kuantan Port face the same issue where the current seaport capacity is 3,000 TEU's and the containers throughput that the port handled is 141,639 TEU's in 2016. In comparison, Penang port, Johor port and Port of Tanjung Pelepas are

facing under capacity issue. Penang Port can cater 2 million TEU's of container throughput. However, Penang port only cater 1.4million container throughput in 2016. Besides, Johor port's capacity is 1.2 million while the container handled is only 827,01 TEU's, while Port of Tanjung Pelepas can cater 10.5 million TEU's annually but the container throughput of the port in 2016 is only 8.3 million. This study has been conducted to know whether OBOR strategy can give an impact to seaport capacity and does it can overcome imbalance capacity issues of seaports in Malaysia.

Table 1. Current capacity VS Throughput 2016

Ports	Current Capacity (TEU's)	Container Throughput handled (TEU's) - 2016	Status of port capacity
Klang	8.4 million	13,209,577	Under capacity
Penang	2 million	1,437,120	Over capacity
Johor	1.2 million	827,01	Over capacity
Kuantan	3,000	141,639	Under capacity
PTP	10.5 million	8,280,710	Over capacity

Source: Authors

Currently, Malaysians seaports are facing imbalance in seaport capacity. For example, Port Klang and Kuantan Port facing an under-capacity issue in handling cargo. In comparison, Penang port, Johor port and Port of Tanjung Pelepas facing an over-capacity issues. Malaysia is facing this imbalance situation in seaport capacity. However, the global container throughput is expected to multiply in the future (see figure 3). Global container throughput has projected to increase from 650 million TEU's in 2013 to 985 million TEU's in 2020, achieving a 6.1% compound annual growth rate (CAGR) which has been forecasted based on a projection of international imports & exports (IMEX) of manufactures [6].

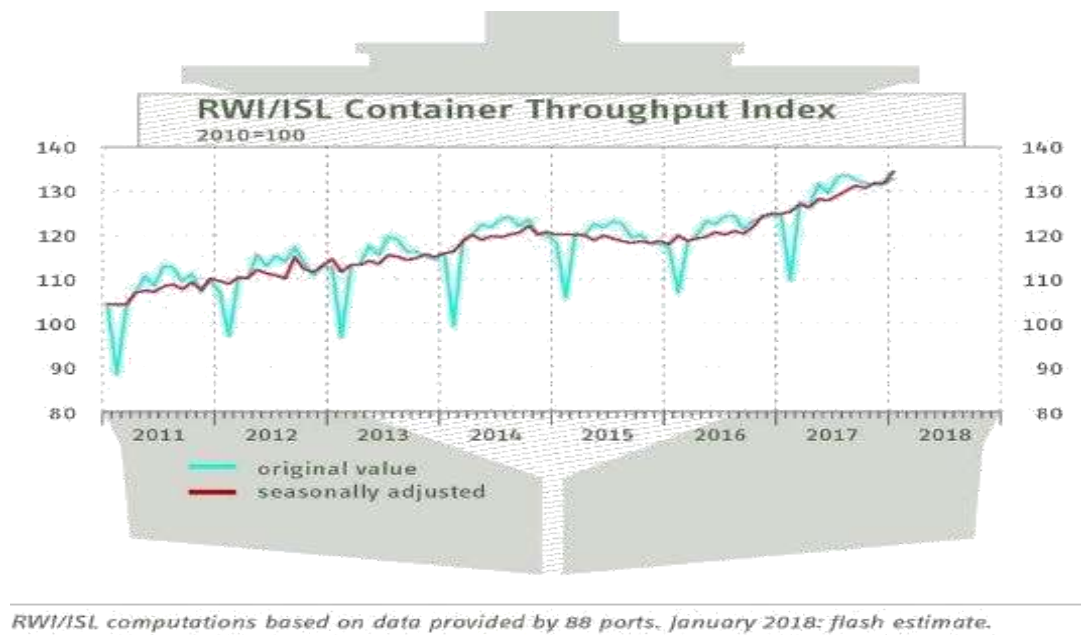


Figure 3. Global Container Throughput 2011-2017 Source: Innovation report (2018).

Based on figure 3, Institute of Shipping Economics and Logistics recorded a strong increase during January 2018, climbing from a value of 131.9 in December 2017 to 134.4 in January 2018 [7]. Due to the increasing trends of global container throughput, Malaysia's container throughput also expected to increase due to their geographical factor, supply and demand of containers as well as emergence of competitive seaports in intra and inter regions

In a nutshell, Malaysia seaports are facing the imbalance rate of seaport capacity, while the trends of total container throughputs are keep increasing year by year. Based on the present scenarios and aligning with multinational global planning this study has been proposed to evaluate the impact of OBOR initiative on Malaysian seaport capacity and to strategies the preparation of Malaysia to comply with this global connectivity strategy.

Method

Quantitative approach was used to quantify the problem by way of generating numerical data into useable statistics. Time series data based on volume of container handled in Port Klang, Kuantan Port, Port of Tanjung Pelepas, Penang Port, and Johor Port had been collected from self-administered questionnaire survey. Then, regression analysis had been conducted to determine the relationship of OBOR and the implications on the Malaysian seaport capacity. Multiple regression had been employed because this analysis was suitable statistical process to estimate the relationship among variables. Hence, more than one independent variables (X) had been evaluated via regression analysis to empirically validate the effect towards one dependent variable (Y). Independent variables in this study were the implications of OBOR strategy consisted of containerised trade, port and shipping services, port infrastructure, logistic connection, and development of hinterland area.

The Implications of OBOR Strategy on Malaysian Seaport Capacity

From regression analysis, F test and coefficient value has done to know whether all of the independent variables have a simultaneous relationship to dependent variable, and to know how much the percentage of the impact. T test has been done to know whether each one of independent variables have partial impact to dependent variable. If the significance value is < 0.05 , then the variable x is significance correlated to variable y. Table 2, 3 and figure 4 show the F test, coefficient value table, and T test to study the implications of OBOR strategy on Malaysian seaports capacity.

Table 2 F-test (simultaneous relationship of dependent variables to independent variables).

Model	Sum of Squares	Df	Mean Square	F	Sig
Regression	31.950	5	6.390	204.5	.000b
Residual	.750	24	.031		
Total	32.700	29			

Table 3 Percentage of simultaneous impact of independent variables to dependent variable.

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	.988 ^d	.977	.972	.17676

Table 2 determines that significance value of hinterland area, port infrastructure, logistic connections, port and shipping services, and containerised trade are $0.000 < 0.05$. Thus, it can be concluded that all independent variables are simultaneously give impact to seaport capacity. While table 3 shows that R value is 0.988 which mean that the development of hinterland area, port infrastructure, logistic connections, port and shipping services, and containerized trade simultaneously give 98% impact to Malaysian seaport capacity.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.313	.468		.689	.510
	Containerized trade	.217	.072	.216	3.026	.006
	Port and shipping services	.112	.077	.110	1.466	.156
	Port infrastructure	.117	.051	.134	2.304	.030
	Logistic connections	.041	.064	.041	.643	.526
	Hinterland area	.505	.091	.543	5.529	.000

Figure 4. T-test (significance value of each independent variable)

Figure 4 indicates, containerized trade, port infrastructure and hinterland are significant ($p \text{ value} \leq 0.05$). Thus, it is partially give an impact to Malaysian seaports capacity. Moreover, the Cronbach alpha value which has been derived via reliability analysis shows that containerized trade, hinterland area, and increasing number of port facilities is 0.924.

Analysis to Evaluate The Preparation Of Malaysia To Comply With OBOR.

In this section, same method has been used, which is multiple regression analysis, been used to evaluate the preparation of Malaysia to comply with OBOR strategy. Table 4 shows the F test that calculates the simultaneous relationship of independent variables to dependent variable. While table 5 shows the percentage of independent variables that contributes simultaneously to the preparation of Malaysia to gain more benefits via this initiative.

Table 4 The outcome of F-test

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	20.392	5	4.078	60.872	.000b
Residual	1.608	24	.067		
Total	22.000	29			

Table 4 determines that value government policy, port expansion, investment, strategic planning, and new equipment are simultaneous to the preparation of Malaysia in order to comply with OBOR strategy is $0.000 < 0.05$. Thus, it can be concluded that all independent variables are significantly contribute to the preparation of Malaysia to comply with OBOR strategy. Table 2.4 shows the percentage of independent variables that contribute simultaneously to preparation of Malaysia to comply with OBOR strategy.

Table 5 Percentage of independent variables that contribute to Malaysian preparation towards OBOR

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	.963 ^d	.927	.912	.25884

R value is 0.963 which mean that the government policy, port expansion, investment to port, strategic planning of port and add new equipment to the port are simultaneously give 96% contribution to Malaysian preparation to comply with OBOR strategy.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.063	.521		3.963	.001
	New equipment	.377	.119	.465	3.159	.004
	Port expansion	.486	.132	.630	3.696	.001
	Strategic planning	-.342	.119	-.364	-2.867	.008
	Investment	-.117	.110	-.131	-1.061	.299
	Government policy	.386	.076	.476	5.073	.000

Figure 5. T-test (Significance value of each independent variables).

From figure 5 above, the significance value of new equipment, port expansion, strategic planning of port, and government policy stated 0.004, 0.001, 0.008, and 0.000 which indicates that p values are ≤ 0.05 . The Cronbach Alpha value shows that port expansion, government policy, strategic planning of port and providing more port equipment is 0.895.

Discussion and Result

The results from the analysis show that Malaysian seaports capacity are significantly impacted by increasing number by containerised trade, development of hinterland area, and improvement in seaport infrastructure. The discussions on outcomes of regression analysis are discussed in the following section.

Containerized Trade

OBOR plan is expecting to boost the containerized trade and broaden the container network within the network [8]. Containerised trade will make the trans loading operation at seaport more effective due to the standard cargo handling equipment and standardize structure of container which based on ISO regulation.

Containerised cargo handling is a way faster than other type of cargo, thus it cut the time consuming of cargo at port, and more cargo can be handle by the port at one time. Furthermore, the increasing number of containerised trade also will increase the number of cargo handle by seaport in Malaysia. According to UNCTAD [9], containerised trade projected to be expanded, with volumes growing at an estimated compound annual growth rate of 3.2 per cent between 2017 and 2022 [8]. Based on this statistic, cargo volume are set to expand across all segments including containerised trade and bulk commodities recording the fastest growth. In Malaysia, the major transshipment hub of containerized trade is Port of Tanjung Pelepas. As a result, ports in Malaysia that face over capacity issues like PTP, can fully utilize their port capacity during this cargo expanding period. Further, OBOR strategy will be an opportunity to overcome an imbalance capacity issues in Malaysian seaports.

Seaport Infrastructure

Malaysia is spurred by investment through China's OBOR strategy which lead to development of various infrastructures to support the expansion in its increasing trade with the world's nations. According to Kakalis [10], OBOR development project in ASEAN Free Trade Area will increase seaport facilities, transportation and communication, attract Foreign Direct Investments. Besides, increasing number of cranes, terminal berth and facilities, and development of automation system will be major factor in increasing Malaysian seaports capacity. Under Malacca Gateway project, the facilities that will be develop include a container and bulk terminal, shipbuilding and repair services, and marine engineering and manufacturing services. The development of new infrastructure and development in deep-seaport will increase the capability of Malaysian seaports to cater bigger ship and more cargo in the future. This situation provides significant possibility to increase Malaysian seaport capacity and providing a rewarding benefits to Malaysian trade.

Hinterland Area

The development of hinterland area through OBOR strategy will affect seaport capacity. According to Farr [11], OBOR strategy will include the construction of industrial parks, agriculture farms, railways, airport, roads, fiber-optic network and it will expanding the port to cope with the industrial needs. For example, the development of Malaysia China Industrial Park (MCKIP) will provide a big steel industry near Kuantan Port, thus it will give the seaport more cargo to handle at one time. As a result, to cater more cargo in the future, several preparations in term of space and capacity of Malaysian seaports can be provided.

In addition, the progress on OBOR initiative provides a solid opportunity for Malaysian seaport hinterland development. Currently, the connectivity for seaport hinterland is highly depends on road network. Further, this initiative could provide additional opportunity for rail network development for seaport-hinterland connectivity. It could happen whereby the connectivity between Singapore-Malaysia-Thailand via rail transport will improve the trade between these nations. This because Thailand and Singapore are main Malaysian traders therefore, the development of rail network via OBOR may enhance inland trade volume between neighboring regions.

Logistic Connections, Port and Shipping Services

The result shows that logistics connection, seaport and shipping services are not significant in order to give impact to Malaysian seaport capacity. According to the participants, logistic connections in Malaysia are not ready to cater high volume of cargo go. As an example, rail gauges in Southern Peninsular area are out dated and too small to carry higher volume of cargo. Due to this problem, many accidents of rail freight occurred which cause damages to cargo. Besides, seaports and shipping services also not significance in giving impact to seaport capacity. This because, multimodal transportation and strict documentation procedure in dry port operations can influenced the efficiency of the supporting process [12].

Seaport Equipment

Port equipment is an important element to ensure effectiveness and efficiency of seaport operations in handling cargo. Current development of facilities and port equipment need to speed up in order to comply with OBOR strategy [12]. This is because, some seaport with under capacity issues will face limited space, inadequate equipment to handling cargo, due to increasing number of cargo caused by OBOR. Due to this issue, seaport should be prepared by providing more quay crane for container seaport, provide more tractor-trailers, lift trucks, rubber-tired gantries and rail-mounted gantries for ports. Besides, the implementation of green technology in port operations is very crucial to ensure efficiency in transporting cargo and at the same time sustaining the natural environment. In addition to that, the execution of various infrastructure development will be a trigger point to implement artificial intelligence in seaport sector. Therefore, the introduction of unmanned Rubber Tyre Gantry (URTG), unmanned Quay Crane (UQC) and others in the Malaysian seaport will be introduced which aligned with 4th industrial revolution.

Seaport Expansion

In this research, strategic planning means a plan needed by seaports to overcome competition issues among Malaysian seaports. Too much competition in a competitive market could lead to overcapacity issue [14]. Thus, strategic planning including seaport alliances are needed in order to share the risks and benefit, prevent too many competitions in selling rivalry services, and at the same time achieving the seaport's goal and objectives in certain time-frame. Furthermore, seaport alliances between Malaysia and China also needed to reduce custom bottleneck and boost trade fluidity between these nations [15]. This situation will reflect to the efficiency of seaports performance and growth in international trade. As a result, the implementation of strategic planning in seaport operation and management may overcome imbalanced capacity issues facing by seaports in Malaysia.

Strategic Planning

In this research, strategic planning means a plan needed by seaports to overcome competition issues among Malaysian seaports. Too much competition in a sluggish market could lead to overcapacity [14]. Thus, strategic planning like port alliances needed in order to share the risks and benefit, prevent too many competitions in selling rivalry services, and at the same time achieving the seaport's goal and objectives. Furthermore, port alliances between Malaysia and China also needed to reduce custom bottleneck and boost trade [15]. This situation will reflect to the efficiency of

seaports performance and growth in international trade. As a result, the implementation of strategic planning in port operation and management can overcome imbalanced capacity issues facing by seaports in Malaysia.

Government Policy

Expansions of seaports are determined by the decision made by the government at a national level and subject to national planning policy [16]. To lead all the development of seaport infrastructure, space and system, the improvement of government policy need to be undertaken. Reduce bureaucracy problem in seaports operation system especially in documentation system is very important in order to ensure efficient performance of seaports. An efficient performance of seaport will increase customer satisfaction and will lead to the loyalty of customer, thus will generate profit to the seaport. Besides, government policy should provide investment and encourage scientific research in innovation and automation in term of seaport operation. For example, research and exploring cutting edge technology like driverless automated guided vehicles or smart sensors are necessary to detect shipping anomalies like piracy or collision.

Conclusion

As a conclusion, OBOR strategy can give impact to Malaysian seaports capacity by various projects that will be develop in Malaysia. OBOR strategy will increase seaport capacity by the development of port infrastructure that can make the trans loading process at seaport more efficient and effective. It increases the capability of seaports to handle more cargo at specific time. On the other hand, OBOR strategy also increase containerized trade and develop wider hinterland area. The development of hinterland area will increase the input, output of seaport, thus more cargo will be handled by seaports, and it will overcome the overcapacity issue face by the seaports. In order to get prepared for a big change in maritime trends caused by OBOR, Malaysia need to be prepared in term of port equipment and facilities, port expansion to cater more cargo in the future, strategic alliance of ports, and improvement in government policy through transparency and digitalization in port operation.

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