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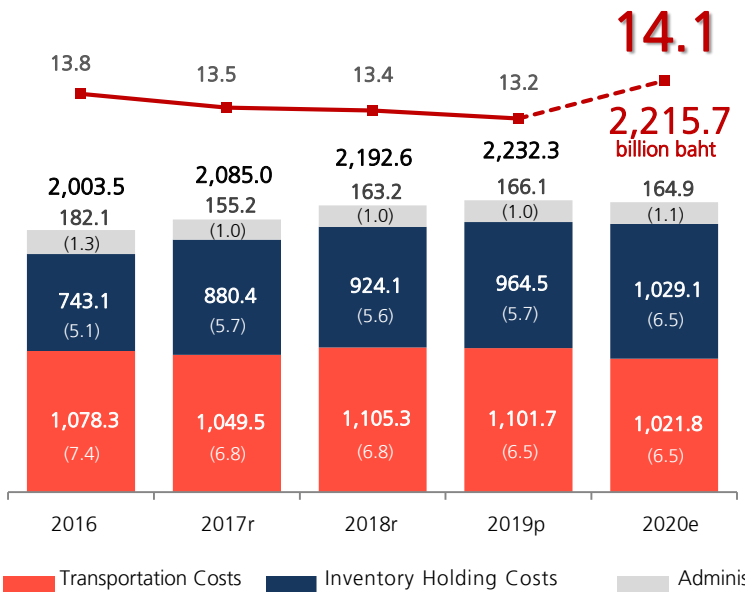
THAILAND'S LOGISTICS REPORT 2020

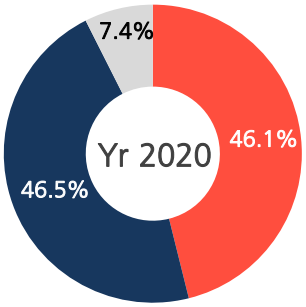
Office of the National Economic and Social Development Council

2020

AGENDA



Logistics Cost Structure



Total Logistics Cost

2,215.7

Billion Baht **- 0.7%** ▼

Total logistics cost in 2020 drops from last year, in accordance with the recession of Thai economic activity due to the spread of COVID-19.

Logistics Costs to GDP at Current Prices

14.1%

+ 0.9% ▲

The logistics costs-to-GDP ratio in 2020 increases. The negative growth rates of GDP are higher than those of logistics costs partly owing to tourism and other service sectors severely affected by the COVID-19.

LOGISTICS SNAPSHOT 2020

Transportation Cost Analysis

Shipment Index

93.47

- 9.0% ▼

Road Freight Transport Index

104.4

- 2.3% ▼

Overall transport in 2020 drops from last year
as evidence through a decrease in both shipment index - reflecting freight volume trends - and road freight transport index - reflecting service costs of road freight transport (a national main mode).

Inventory Holding Cost Analysis

Inventory Ratio Index

155.8

+ 16.1 ▲

Capacity Utilization Rate

61.0

- 8.0 ▼

MLR

5.41-5.78

Inventory carrying costs increase as inventory ratio index – a proxy for a change of finished goods inventory to number of goods distributed – increases while capacity utilization rate declines. Entrepreneurs are having difficulty in managing existing inventory although they have reduced their production capacity after witnessing slow economic growth.

MLR is Reduced
by the policy rate decisions of Monetary Policy Committee.

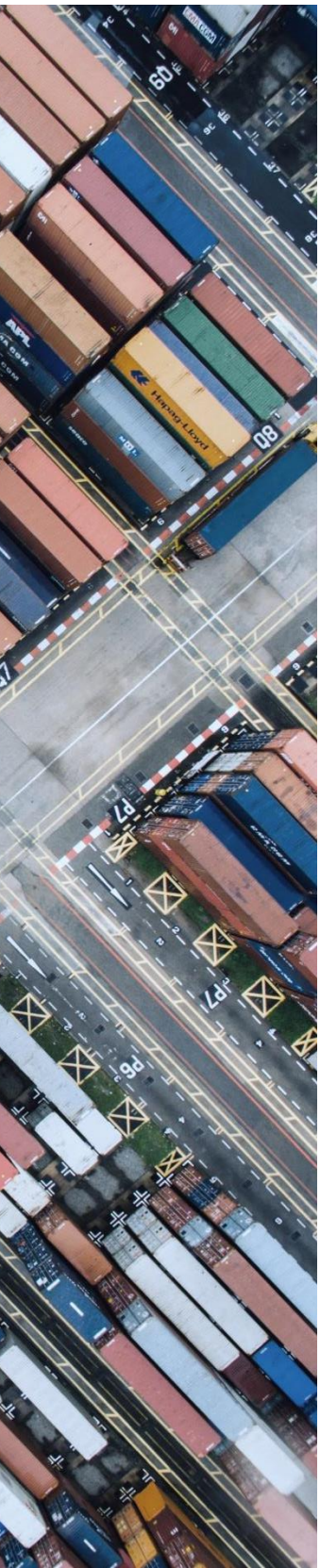
Value Added of Logistics Businesses

477.4 Billion Baht

- 2.0% ▼

Value added of logistics businesses declines from last year,
which amounts to 477.4 billion baht or reduces by 2.0% from 487.0 billion baht in 2019.

Logistics Report
Executive Summary



Part 1 Thailand's Logistics Costs

- Overview of Thailand's Logistics Costs
  - **In 2019, Thailand's logistics costs were 2,232.3 billion baht and equivalent to 13.2% of Gross Domestic Product at Current Prices (Nominal GDP).** The costs slightly increased from last year or accounted for a 1.81% growth rate, in line with the national economic slowdown due to the impacts of the US-China trade war on the global economy.
  - **In 2020, Thailand's logistics costs are estimated to amount to 2,215.7 billion baht and to equal to 14.1% of Nominal GDP.** The costs scantly decline from the previous year or account for a 0.7% decrease. The cost reduction is affected by the contraction of both national economic activity and global economy as a consequence of the coronavirus disease 2019 (COVID-19) outbreak. Besides, the negative growth rates of GDP are higher than those of logistics costs, partly because of tourism and other service sectors severely affected by the COVID-19.

- **Logistics Costs-to-GDP Estimates for 2021** are envisioned to improve owing to the growth of domestic economic activity and demand along with the global economic recovery. Thailand's logistics costs are expected to be 13.8%-14.0% of GDP. Still, assessment of potential risk factors, especially for the ongoing COVID-19 pandemic, and the rise in oil prices and shipping rates are still of importance.

- **Value Added of Logistics Businesses** in 2020 is estimated to be 477.4 billion baht declining from 487.0 billion baht in 2019 (or accounting for a slight decrease of 2.0%) due to the COVID-19 pandemic. Entrepreneurs have to adjust their strategies to align with the current situation, which causes them extra costs and expenses.

Part 2 Global Logistics Costs

- **Global Logistics Costs to GDP** The survey results from Armstrong & Associate Inc., a third-party logistics (3PL) and market-research-consulting expert, reveal that 2019 global logistics costs as a percentage of global GDP were 10.7%. North America and Europe had the least logistics costs as a percentage of GDP accounting for 8.4% and 8.7% consecutively while the Asia-Pacific region had logistics costs to GDP of 12.8%.

- **Agility Emerging Markets Logistics Index (AEMLI)** In 2021, Thailand ranks 11th from 50 countries worldwide, dropping from the 9th in the previous year. It is noteworthy that Vietnam ranks 8th moving up three places from last year because of its promising alternative as its geographical proximity to China, a large and key market; and successful COVID-19 control leading to rapid manufacturing and export recovery.

- **US Logistics Costs** In 2020, US logistics costs are 1,557.5 billion USD, a 4.0% drop from last year, or equal to 7.4% of GDP. During the first half of the year, US logistics businesses are affected by the cessation of economic activity due to the spread of COVID-19, which impacts their inventory carrying costs. Then, in the second half of the year, the businesses begin to revive through government support and business strategy adjustment.

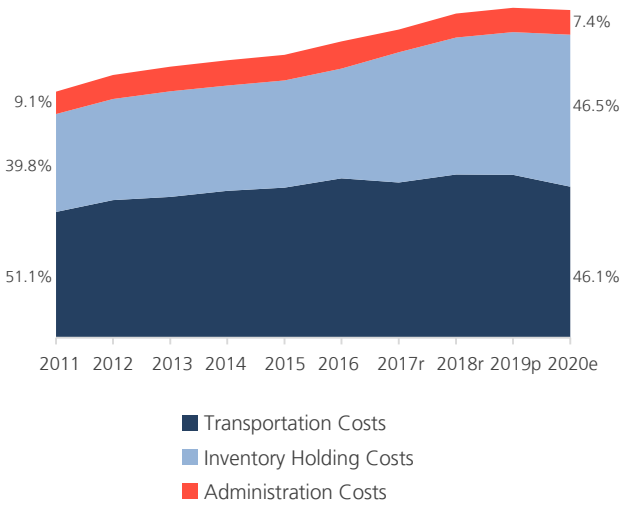
Part 3 Recommendations and Way Forward

1. **Adopt technology and innovation to enhance logistics management efficiency, and adapt business operations and services to align with e-commerce strategies.** Promote Thai entrepreneurs to adopt technology and innovation to enhance efficiency in their business operations and logistics management. Encourage the entrepreneurs to adapt their operations and logistics services to align with e-commerce trends.
2. **Integrate and facilitate up-to-date logistics information exchanges especially in the times of crisis.** Develop a logistics information exchange platform to provide Thai entrepreneurs with up-to-date global logistics situations, and laws and regulations of their trading partners, especially during a crisis in preparation for unexpected changes.
3. **Manage and increase the utilization of infrastructure, logistics facilities, and supporting factors.** Promote the efficient use of railway systems as the main mode of national freight transport along with supporting systems and other logistics facilities. Encourage private sector involvement in infrastructure management and service development. Develop electronic information exchange systems of import and export procedures. Expedite the development and utilization of a complete National Single Window (NSW) solution that enables all business-to-government (B2G) transactions and links to Thailand's National Digital Trade Platform (NDTP).

Part 1 Thailand's Logistics Costs

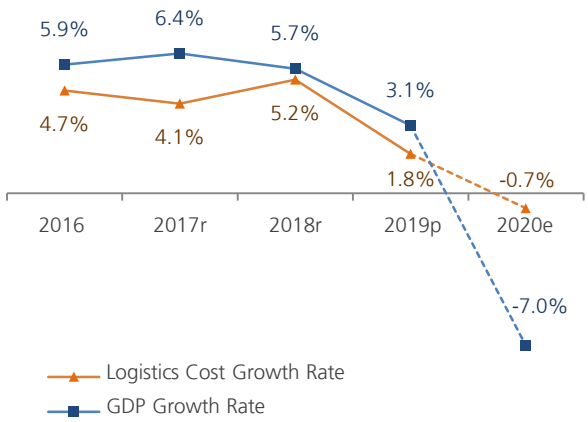
1. Logistics Cost Overview

Figure 1 Thailand's Logistics Costs



Source: Logistics Development Strategy Division, NESDC

Figure 2 Trends of Logistics Costs and GDP at Current Prices



Source: Logistics Development Strategy Division, NESDC

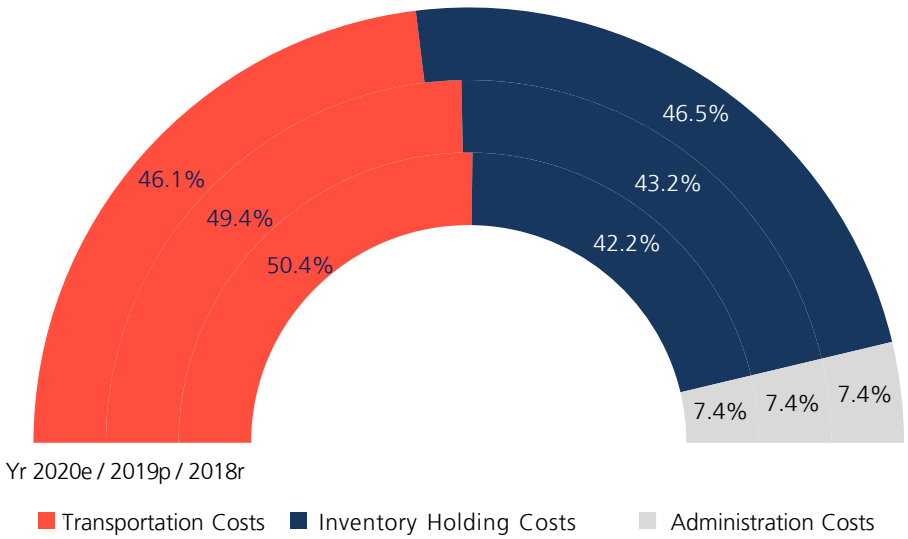
In 2019, Thailand's logistics costs were 2,232.3 billion baht increasing from 2,192.6 billion baht in 2018 – which accounted for a 1.8% increase - or **equivalent to 13.2% of Gross Domestic Product at Current Prices (Nominal GDP).** The total cost included 1,101.7 billion baht of transportation costs (or equal to 6.5% of GDP), 964.5 billion baht of inventory holding costs (or equal to 5.7% of GDP), and 166.1 billion baht of logistics administration costs (or equal to 1.0% of GDP). The cost slightly increased from last year, in line with the national economic slowdown as a consequence of global economic volatility due to the US-China trade war.

In 2020, Thailand's logistics costs are estimated to amount to 2,215.7 billion baht reducing from 2019 - a 0.7% decline - or **equal to 14.1% of GDP** - which increases from last year. The total cost includes 1,021.8 billion baht of transportation costs (6.5% of GDP), 1,029.1 billion baht of inventory holding costs (6.5% of GDP), and 164.9 billion baht of logistics administration costs (1.1% of GDP). The cost reduction is in accordance with the cessation of economic activity translated into the national economic downturn as a consequence of the global economic disruption from coronavirus disease (COVID-19). The COVID-19 has severely affected many countries worldwide, including Thailand. Besides, trends in Thai logistics costs as a percentage of GDP are quite volatile. The negative growth rates of GDP are higher than those of logistics costs, partly owing to tourism and other service sectors severely affected by COVID-19.

2. Logistics Cost Structure

In 2020, inventory holding costs as the largest cost component, replacing transportation costs last year, account for 46.5% of total logistics cost (increasing from 43.2% in 2019), followed by transportation costs contributing to 46.1% (declining from 49.4% in 2019), while logistics administration costs remain unchanged at 7.4%. The main factors include the cessation of domestic economic activity and export contraction as a result of the COVID-19 outbreak. These factors have an influence on entrepreneurs' inventory management efficiency.

Figure 3 Logistics Cost Structure



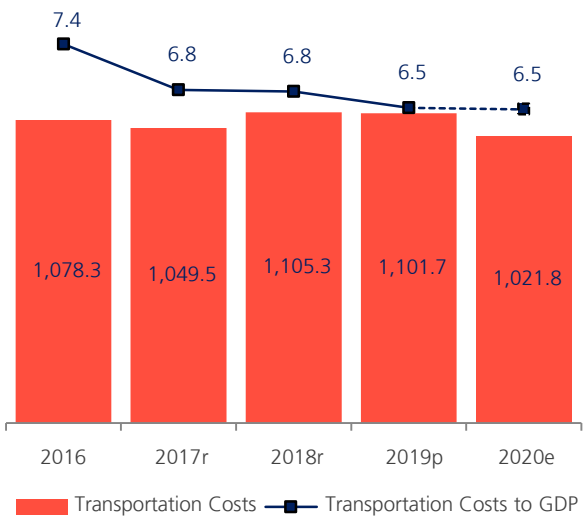
Source: Logistics Development Strategy Division, NESDC

3. Logistics Cost Components

1) Transportation Costs

In 2020, transportation costs are 1,021.8 billion baht reducing from 1,101.7 billion baht in 2019 or account for a 7.3% decline. The costs are equivalent to **6.5% of GDP.** The cost decline is due to overall freight volume contraction and decreasing freight transport service prices, in accordance with the national economic trends. More detail is provided in the following section.

Figure 4 Transportation Costs (Billion Baht)

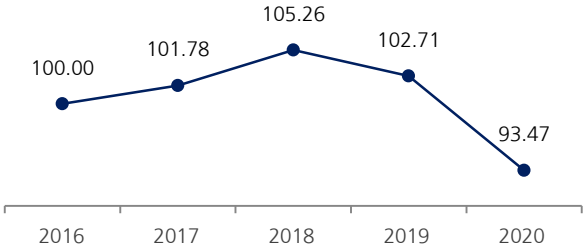


Source: Logistics Development Strategy Division, NESDC

(1) Freight Volume Overview

Overall freight volumes in 2020 fall from last year. The shipment index is 93.47 dropping from 102.71 in 2019, or a 9.0% fall, aligning with domestic economic activity deceleration. The analysis is provided below.

Figure 5 Shipment Index

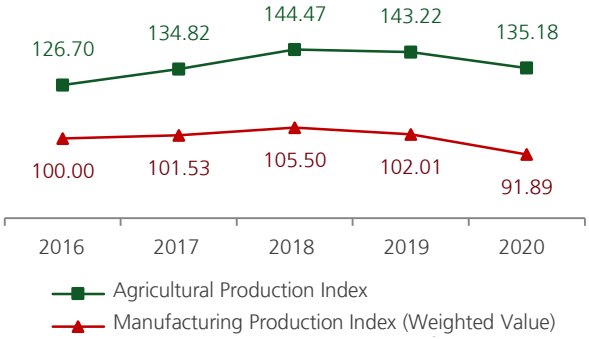


Source: The Office of Industrial Economics, Ministry of Industry

• Industrial Production

Overall industrial production level in 2020 is lower than last year. The agricultural production index is 135.2 reducing from 143.2 in 2019 - or a 5.6% drop – especially in paddy, sugarcane, pineapple, palm oil, orchid, and white shrimp. And, the manufacturing production index is 91.9 falling from 102.0 in 2019 - or a 9.9% decline - especially in sugar, alcoholic beverages, clothing and textiles, leather, rubber and plastics, motor vehicles, and machinery.

Figure 6 Agricultural and Manufacturing Production Index

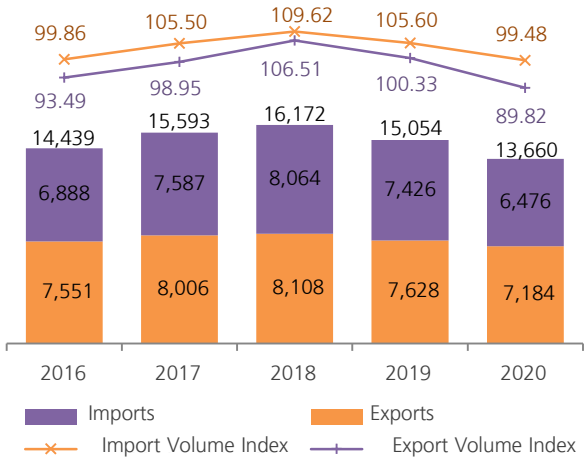


Source: Office of Agricultural Economics, Ministry of Agriculture and Cooperatives and The Office of Industrial Economics, Ministry of Industry

• International Trade

Overall volume and value of both imports and exports in 2020 decrease from last year. The import volume index is 89.8 falling from 100.3 in 2019 – or a 10.5% decline. And, the export volume index is 99.5 dropping from 105.6 in 2019 – or a 5.8% fall. Additionally, the value of Thai foreign trade is around 13,660 billion baht dropping from 15,054 billion baht in 2019 – or a 9.3% decrease - especially in major country groups, namely, the European Union, ASEAN, the Middle East, and BIMSTEC.

Figure 7 Import and Export Volume Index

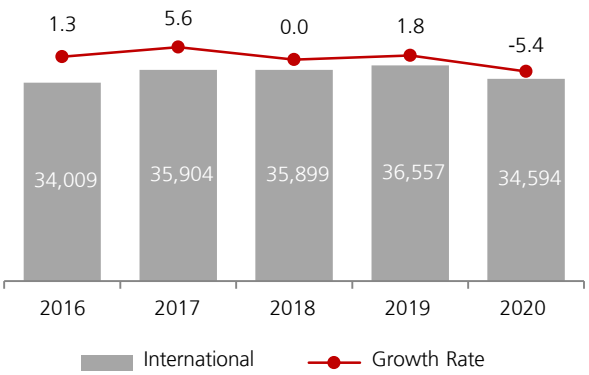


Source: Ministry of Commerce and Bank of Thailand

• Freight Shipments by Mode

Road Freight Transport shows a decreasing trend due to the spread of COVID-19, and the effect of import and export restrictions and temporary closure of border checkpoints. In 2020, international road freight volumes are 34,594 thousand tons falling from 36,557 thousand tons in 2019 – or a 5.4% decrease.

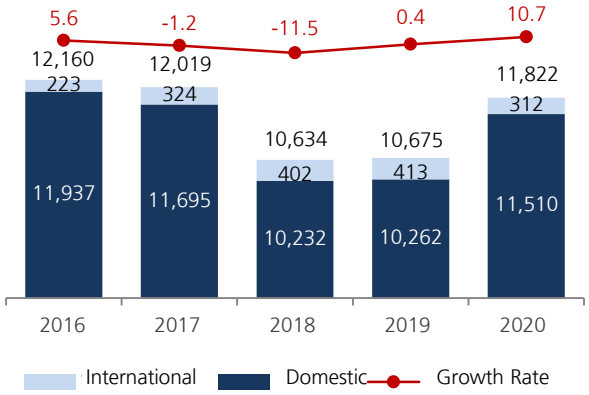
Figure 8 Road Freight Volumes (Thousand Tons)



Source: The Customs Department Processed by Ministry of Interior

Rail Freight Transport in 2020 has a volume of 11,822 thousand tons, rising from 10,675 thousand tons in 2019, or accounts for a 10.7% increase. The government has continuously emphasized railway development to further support freight transport, including double-track railway development, Single Rail Transfer Operator (SRTO) project, and freight cost reduction.

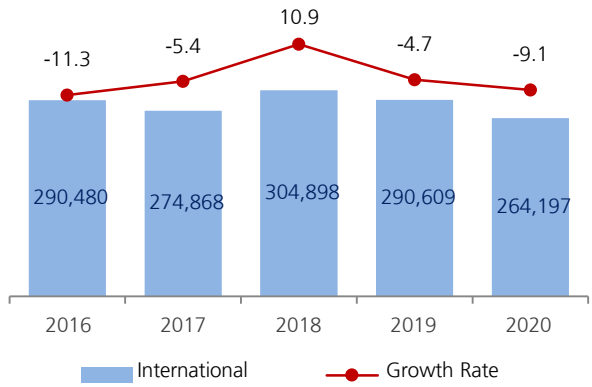
Figure 9 Rail Freight Volumes (Thousand Tons)



Source: State Railway of Thailand and The Customs Department Processed by Ministry of Interior

Water Freight Transport shows a declining trend. In 2020, international water freight transport has a volume of 264,197 thousand tons falling from 290,609 thousand tons in 2019, or a 9.1% drop, as trading partners impose temporary import/export restrictions. Also, entrepreneurs are facing shipping container shortage problems owing to limited shipping schedules and routes, and a shipping backlog at the destination (as a result of COVID-19). In 2020, Laem Chabang port handles 5.60 million TEU falling from 7.98 million TEU in 2019 – or a 29.8% decline.

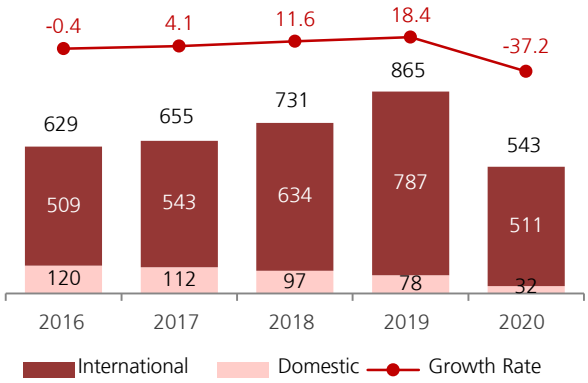
Figure 10 Water Freight Volumes (Thousand Tons)



Source: The Customs Department Processed by Ministry of Interior

Air Freight Transport in 2020 has a volume of 543 thousand tons falling from 865 thousand tons in 2019 or accounts for a 37.2% decline. The cause is partially from travel restriction measures to prevent the COVID-19 outbreaks, which leads to domestic and international flight reduction affecting overall transport competitiveness.

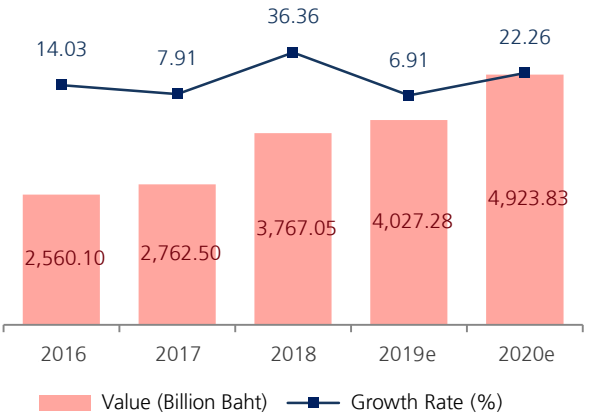
Figure 11 Air Freight Volumes (Thousand Tons)



Source: Department of Airports, Civil Aviation Authority of Thailand, Airports of Thailand, and The Customs Department Processed by Ministry of Interior

However, the COVID-19 pandemic affects online consumer behavior shifts along with rising door-to-door and last-mile delivery demand leading to a growing number of e-commerce businesses. In 2019, Thai e-commerce market was valued at 4,027.28 billion baht, or equivalent to a 6.91% annual growth. In 2020, the Thai e-commerce market is valued at 4,923.83 billion baht, or equal to a 22.26% growth rate. Hence, entrepreneurs have to adjust their strategies to support changing consumer behavior and align with the e-commerce trends.

Figure 12 E-Commerce Market Value



Source: Electronic Transactions Development Agency (ETDA)

LOGISTICS INSIGHT 1: Laos-China Railway

Laos-China railway is one of the project development of the China-Indochina Peninsula Economic Corridor (CICPEC) under China's Belt and Road Initiative (BRI) to transport passengers and goods from Southern China (Kunming) to Laos (ending in Vientiane) with total distance of approximately 422 kilometers. The single-track rail network with the standard 1.435-meter gauge is constructed to travel at a speed of 160 km/hour. The railway with over 90% of engineering work completed is expected to open on December 2nd, 2020. This project could increase passenger and freight travel; reduce freight costs and transit times from China to Thailand; and promote future trade, investment and tourism.

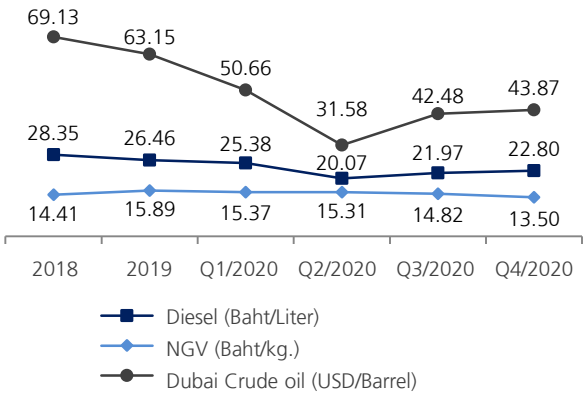
Source: http://www.xinhuanet.com

(2) Factors Affecting Freight Prices

• Retail Oil Prices

The average retail oil price in 2020 for diesel is at 22.56 baht/liter decreasing from 26.46 baht/liter in 2019 or accounts for a 14.7% decline, especially in the 2nd quarter as global crude oil price falls because of a decline in economic activity leading to dropping oil demand. Meanwhile, the average retail NGV price in 2020 is at 14.75 baht/kg. declining from 15.89 baht/kg - or a 7.2% decrease - partially owing to government regulation on NGV price ceilings and structural pricing changes in the 2nd half of 2020.

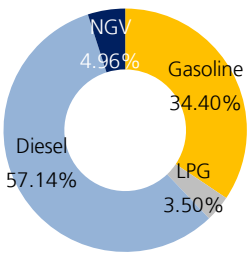
Figure 13 Average Retail Fuel Price



Source: Bank of Thailand and Federal Reserve Economic Data

In 2020, total diesel consumption accounts for 57.0% of total fuel consumption in the land transport sector while total NGV consumption accounts for 5.0%.

Figure 14 Total Fuel Consumption in the Transport Sector (%)

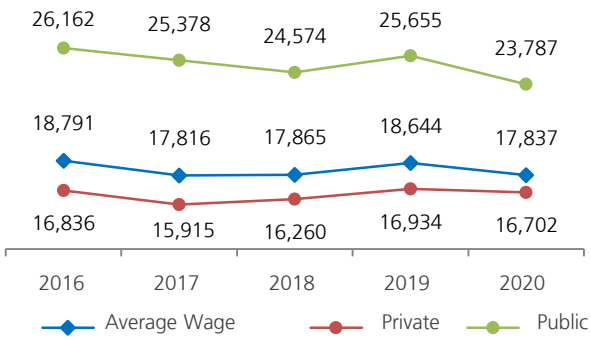


Source: Energy Policy and Planning Office, Ministry of Energy

• Average Wage

The average wage of transportation and storage in 2020 is 17,837 baht/month declining from 18,644 baht/month in 2019 or accounts for a 4.3% drop - owing to working hour reduction as a consequence of curfew and work-from-home policy to curb the spread of COVID-19. Likewise, the national statistical survey shows that public wages (including state enterprises) are higher on average than the private ones (including laborers who receive a minimum wage).

Figure 15 Average Wage of Transportation and Storage (Baht/Month)



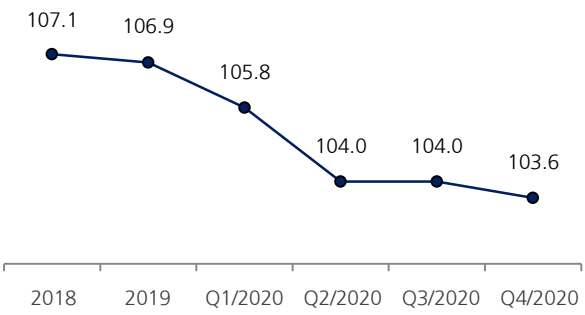
Source: National Statistical Office of Thailand

However, total employment in the transportation and storage sector in 2020 accounts for 1.33 million people slightly increasing from 1.30 million people in 2019 or equal to a 1.94% increment. The increment is partially from the adjustment of transport-related business strategy that aligns with consumer behavioral shifts to online shopping channels.

• Road Freight Transport Index (RFTI)

The 2020 Annual Road Freight Transport Index (RFTI) (104.4) falls from last year (106.9), a 2.3% drop. The RFTI drops quarterly owing to falling oil prices and lower freight transport demand from a reduction of industrial production, and importing and exporting. Also, all components of RFTI: agriculture, mining, and manufacturing (e.g., agricultural products, livestock and forestry; metals and other minerals; and food, beverages and tobacco) decline.

Figure 16 Road Freight Transport Index

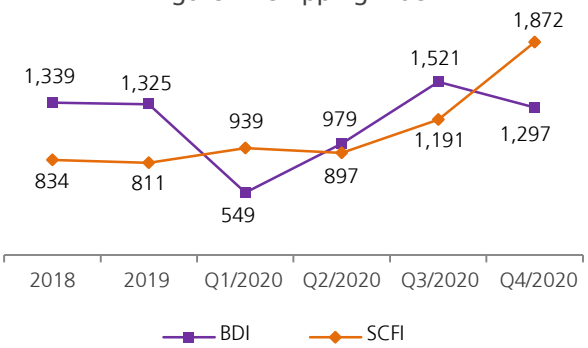


Source: Trade Policy and Strategy Office, Ministry of Commerce

• Shipping Index

In 2020, the shipping index increases in the 2nd half of the year and still shows a rising trend. The Baltic Dry Index (BDI), a proxy for an average dry bulk shipping cost of major shipping routes, in 2020 reveals a declining trend in the 1st quarter as the COVID-19 outbreak starts to spread, which leads to global supply chain disruption. Likewise, many countries ban travel and freight transport, especially from China. However, the BDI starts to rise since the 2nd quarter as many entrepreneurs worldwide are adapting to the COVID-19, together with China's successful COVID-19 control, which leads to global economic recovery. A growing number of agricultural commodities from the agricultural growing season also causes the rising BDI.

Figure 17 Shipping Index



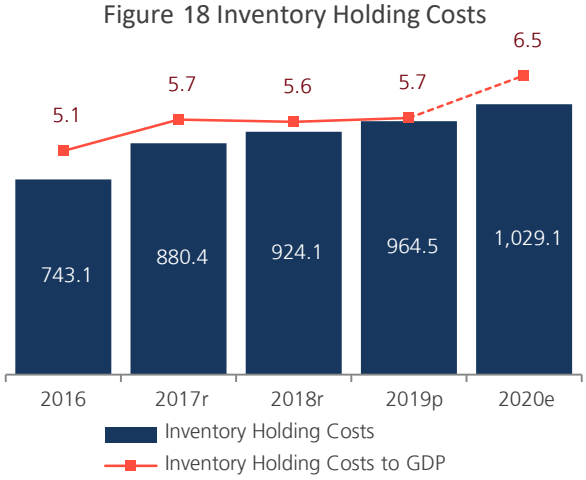
Source: www.tradingeconomics.com and Shanghai Shipping Exchange (SSE)

Likewise, the Shanghai Containerized Freight Index (SCFI), a proxy for an average container shipping cost of major shipping routes, in 2020 shows a continuous growth trend especially in the 2nd half of the year. The higher shipping rates are due to several reasons. Shipping lines have to reduce their sailings to cope with the situation, along with the effect of easing lockdown measures in many countries, which leads to higher freight demand. Additionally, top export regions (e.g., United States, European Union) experiencing an ongoing COVID-19 outbreak struggle to return the empty containers to the origin on time causing container shortages.

2) Inventory Holding Costs

In 2020, inventory holding costs are 1,029.1 billion baht increasing from 964.5 billion baht in 2019, which accounts for a 6.7% decrease. The costs are equivalent to **6.5% of GDP.** The costs comprise 839.4 billion baht of inventory carrying costs (increasing from 773.4 billion baht in 2019 or a 8.5% increase) and 189.7 billion baht of warehousing costs (falling from 191.0 billion baht in 2019 or a 0.7% decrease). Factors affecting the inventory holding costs are summarized below.

Figure 18 Inventory Holding Costs



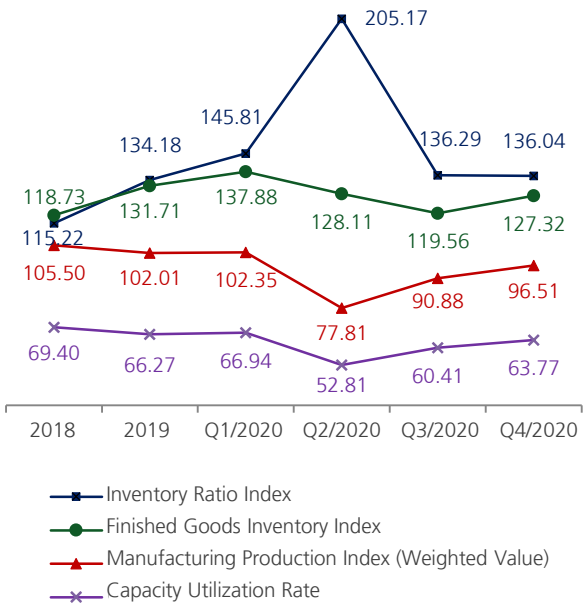
Source: Logistics Development Strategy Division, NESDC

(1) Rising Inventory Carrying Costs

The inventory ratio index in 2020 is 155.8 increasing from 134.2 in 2019 or equal to a 16.1% increase. The result reflects the difficulty that entrepreneurs are facing by holding excess inventory that is unable to distribute to the market, which affects inventory management efficiency - the main cause of inventory carrying cost increment.

However, **the finished goods inventory index is 128.2** falling from 131.7 in 2019 (or dropped by 2.7%); **the capacity utilization rate is 61.0** dropping from 66.3 in 2019 (or fallen by 8.0%). The results reflect that entrepreneurs reduce their production capacity leading to a slight fall of inventory levels after witnessing slow economic growth, especially in the 2nd quarter.

Figure 19 Industrial Indices

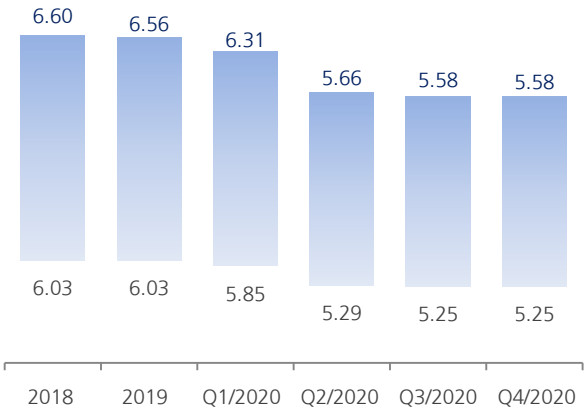


Source: The Office of Industrial Economics, Ministry of Industry

(2) Decreased Minimum Lending Rate (MLR)

The 2020 Minimum Lending Rates (5.41% - 5.78%) are lower than those of the previous year. The trend is in line with the policy of the Monetary Policy Committee (MPC) which intends to utilize expansionary monetary policy to support national economic recovery under global economic and fiscal uncertainty. Other fiscal measures to support entrepreneurs in response to COVID-19 include soft loans as financial rehabilitation measures aiming to maintain SMEs liquidity.

Figure 20 Minimum Lending Rate (MLR)

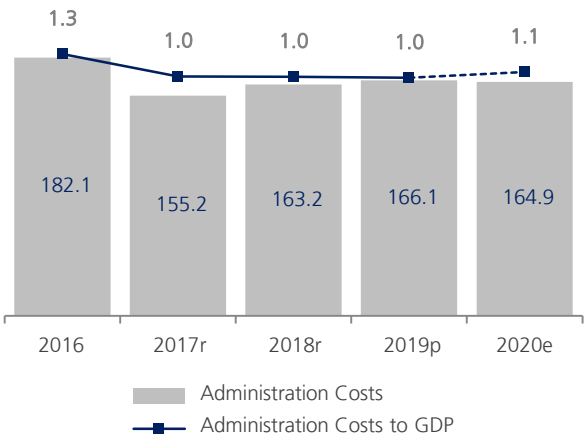


Source: Bank of Thailand

3) Logistics Administration Costs

In 2020, logistics administration costs are 164.9 billion baht reducing from 166.1 billion baht in 2019 (decreased by 0.7%). The costs are equivalent to **1.1% of GDP.** (This logistics administration cost calculation is based on the study results from The Improvement of Thailand's Logistics Cost Calculation Model by NESDC (2019) that logistics administration costs employ 8.04% of total transportation cost and inventory holding cost).

Figure 21 Logistics Administration Costs

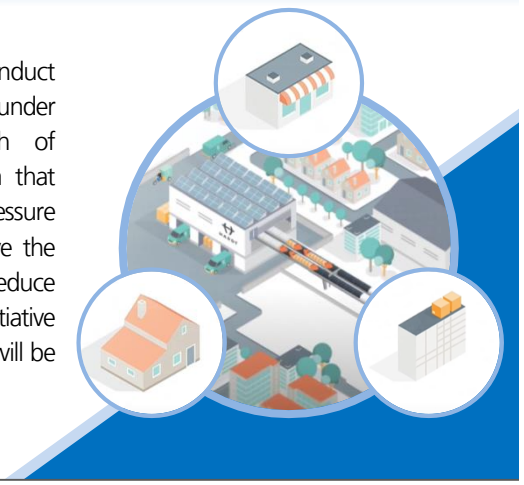


Source: Logistics Development Strategy Division, NESDC

LOGISTICS INSIGHT 2: Cargoloop

Hardt Hyperloop Inc. collaborates with Amsterdam University to conduct the feasibility study on Hyperloop transportation in Europe under the project called Cargoloop for the continuous growth of e-Commerce. The Cargoloop is the autonomous cargo system that allows autonomous vehicles to travel through an enclosed low-pressure tube at a speed of up to 700 km/h. The system aims to improve the efficiency of freight transport and inventory level control, and reduce inventory holding costs and CO_2 emissions. The Cargoloop's initiative route (in the Netherlands) will be completed in October 2020 and will be further tested and developed for commercial use in 2023.

Source: Hardt Hyperloop Inc. and http://www.citylogistics.info



4. Logistics Costs-to-GDP Estimates for 2021

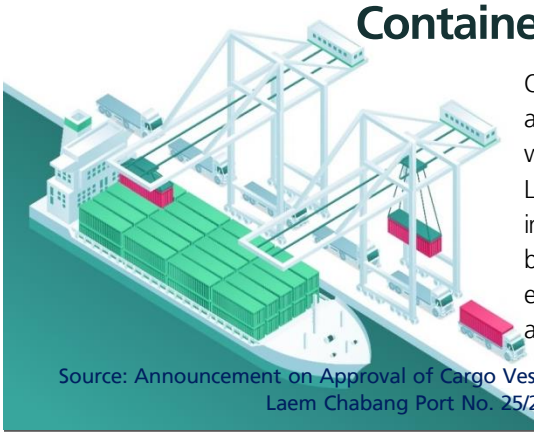
From late 2020 to mid-2021, Thailand's successful COVID-19 controls have led to economic recovery. An increase in domestic demand, along with the global economic recovery, and the government's economic stimulus measures have an impact on the expansion of private consumption and investment, and exports. Likewise, Thailand's logistics costs in 2021 are envisioned to increase. Logistics costs to GDP are expected to be 13.4% - 13.8%. Still, the assessment of potential risk factors is of importance. For instance, the ongoing COVID-19 pandemic that spreads nationwide causes the economic recovery to slow down or cease. Other relevant factors (including rising oil prices and shipping rates) that can affect Thailand's logistics costs also need to be considered.

Table 1 Thailand's Logistics Costs-to-GDP Estimates

Detail	Actual Data				Projection for
	2019	2020	Q1/2020	Q2/2020	2021
Thailand's Logistics Costs to GDP at Current Prices /1	13.2 (p)	14.1 (e)	-	-	13.4 -13.8
GDP Growth (CVM, %) /2	2.3	- 6.1	- 2.6	7.5	0.7 – 1.2
World Economic Growth (%) /2	2.8	-3.2	-	-	6.0
World Trade Volume (%) /2	0.9	-8.3	-	-	8.5
Import Volume of Goods (%) /2	-5.8	-10.5	6.7	32.0	15.6
Export Volume of Goods (%) /2	-3.7	-5.8	2.9	30.9	13.3
Dubai Crude Oil (USD/Barrel) /2	63.3	42.4	60.3	67.5	62.0 – 72.0
Manufacturing Production Index /3	102.0	91.9	103.6	95.9	-
Shanghai Containerized Freight Index (SCFI) /4	- 2.75	51.05	126.95	17.23	-
Minimum Lending Rate (MLR) /5	6.03 - 6.56	5.41 - 5.78	5.25 - 5.58		-

Source: /1 Logistics Development Strategy Division, NESDC
/2 The Thai Economy in Q2/2021 and the Outlook for 2021 as of 16 August 2020, NESDC
/3 The Office of Industrial Economics, Ministry of Industry
/4 Shanghai Shipping Exchange (SSE)
/5 Bank of Thailand

LOGISTICS INSIGHT 3: **Dock Regulation Improvement to Ease Container Shortage**



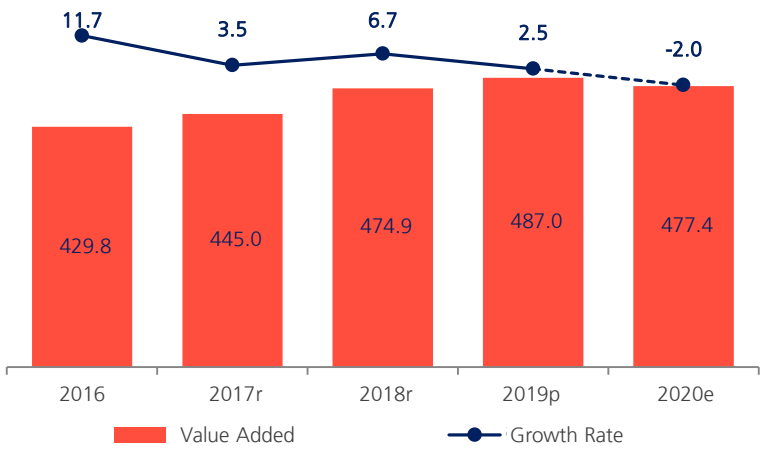
On February 9, 2021, dock regulations have been amended by allowing cargo vessels over 300 m but not more than 400 m long with written permission from the Marine Department to enter the Laem Chabang port for up to two years. The amendment aims to increase a number of container ship entering Laem Chabang port by 20%-30%, which, in turn, 12,000 empty TEUs per trip are expected to be returned. Container shortage problems will be alleviated, and shipping from Thailand will have lower rates.

Source: Announcement on Approval of Cargo Vessels Over 300 Meters but Not More Than 400 Meters Long Entering the Laem Chabang Port No. 25/2564 Dated February 9, 2020, Marine Department, Ministry of Transport

5. Value Added of Thailand's Logistics Businesses

The value-added logistics is an indicator of The Third Thailand Logistics Development Plan (2017-2022) to reflect value creation in the supply chain and logistics systems. The value added is measured by the gain from domestic logistics-related activities of logistics service providers (LSPs) using the data from the System of National Accounts generated by the Office of the National Economic and Social Development Council.

Figure 22 Value Added of Logistics Businesses



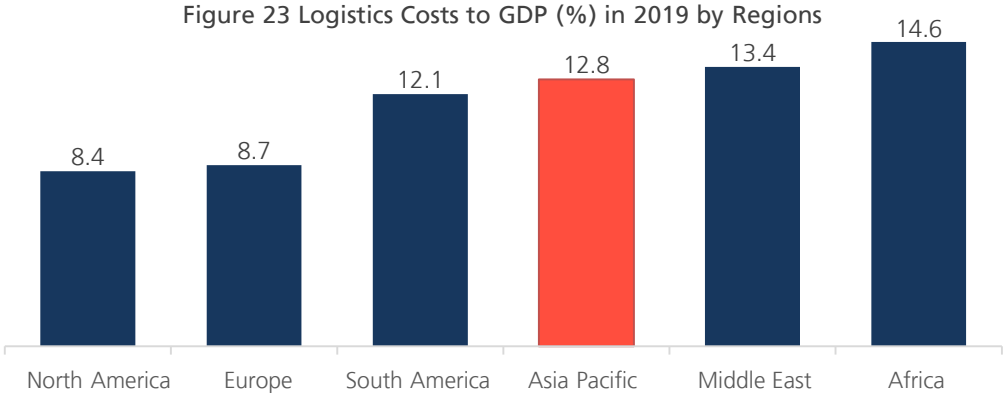
Source: Logistics Development Strategy Division, NESDC

In 2020, value added of Thailand's logistics businesses scantly decreases. The value added is 477.4 billion baht dropping from 487.0 billion baht in 2019 or accounts for a 1.98% fall. The COVID-19 pandemic has led to the contraction of both the global economy and domestic economic activities (including tourism, manufacturing, and imports and exports), which affects LSPs' value-added services and activities. Besides, most LSPs employ a customer-centric strategy by providing customers with efficient, safe, fast, and on-time delivery services with reasonable shipping charges in order to boost customer satisfaction and to increase business sales and profitability. Thus, entrepreneurs have to adjust their strategies to align with the current situation, which causes them extra costs and expenses (and in turn affects overall Thailand's value-added logistics).

Part 2 Global Logistics Costs

1. Global Logistics Costs to GDP

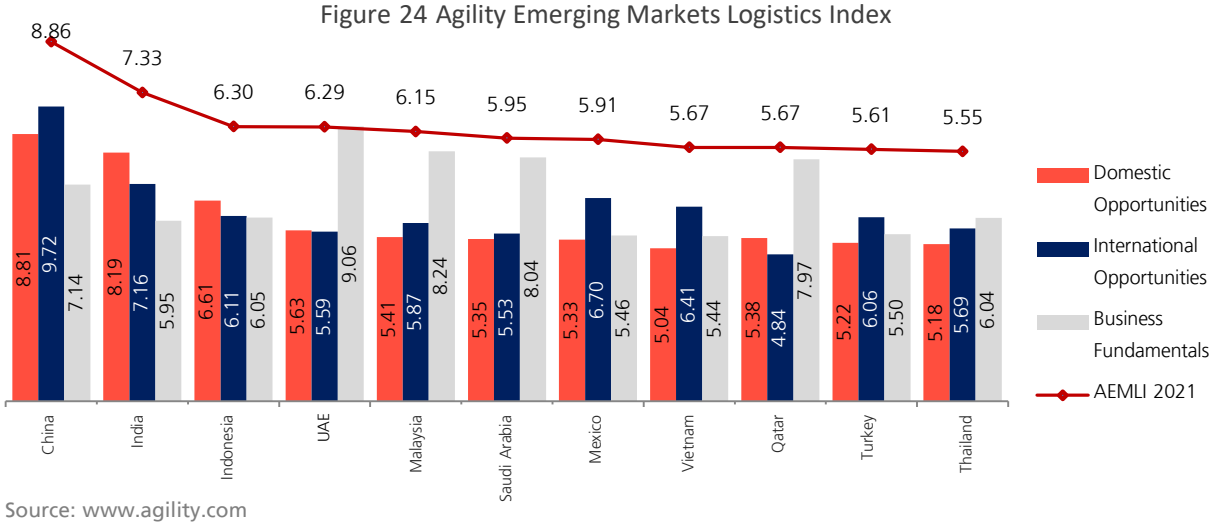
Figure 23 Logistics Costs to GDP (%) in 2019 by Regions



Source: Armstrong & Associates

The survey results from Armstrong & Associate Inc., a third-party logistics (3PL) and market-research-consulting expert, reveal that 2019 global logistics costs as a percentage of global GDP were 10.7%. North America and Europe had the least logistics costs as a percentage of GDP accounting for 8.4% and 8.7% consecutively while the Asia-Pacific region had logistics costs to GDP of 12.8%.

Figure 24 Agility Emerging Markets Logistics Index



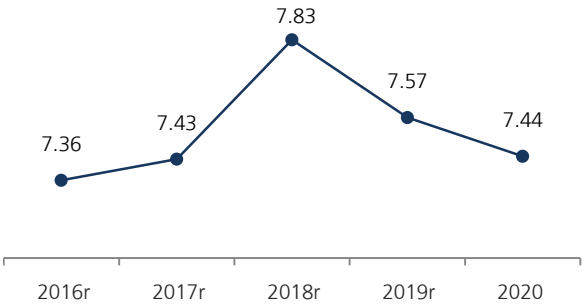
Source: www.agility.com

The results of the Agility Emerging Markets Logistics Index (AEMLI) by Agility Co., Ltd., a global leading logistics expert, reveal that in 2020, the People's Republic of China and India rank 1st and 2nd consecutively while Thailand ranks 11th from 50 countries worldwide dropping from 9th last year. It is noteworthy that Vietnam ranks 8th moving up three places from last year. The report states that Vietnam is a promising alternative as its geographical proximity to China, a large and key market. In addition, importantly, it is one of the world's leading successful COVID-19 controls leading to rapid manufacturing and export recovery.

2. US Logistics Costs

Annual State of Logistics Report 2021 by The Council of Supply Chain Management Professionals (CSCMP) and Kearney reveals that total US logistics cost in 2020 is around 1,557.5 billion USD (a 4% decrease from last year) or equal to 7.4% of GDP reducing from 7.6% of GDP in 2019 as summarized below.

Figure 25 Logistics Costs to GDP of The United States of America



Source: CSCMP's 32nd Annual State of Logistics Report 2021

1) Transportation Costs

Transportation costs, the largest cost component, amount to approximately 1,059.0 billion USD (a 0.8% rise from last year), consisting of:

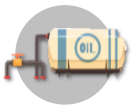
Motor Carriers as the largest cost component in the transport sector scantly drop at 0.6% owing to the reduction of production capacity during the COVID-19 pandemic.

Parcel has the highest growth rate accounting for 24.3% as a consequence of the continuous growth of e-commerce business and last-mile delivery.

Rail drops at 11% as domestic freight transport declines even though the international one slightly expands.

Air Freight rises at 9.0% owing to higher air frieght charges resulted from falling air cargo capacity as commercial flights get suspended, which accounts for half of the total freight volumes.

Water reduces by 28.6% owing to international water freight transport contraction, especially in the first half of the year.



Pipeline slightly increases at 1.7%, although oil prices and volumes decline. The result reflects that business expenses are rising under this abnormal situation.

Table 2 Total Logistics Cost of USA (Billion USD)

Logistics Costs (Billion USD)	Value 2019r	Value 2020	YoY (%)
Transportation Costs	1,050.6	1,059.0	0.8
Motor Carriers	688.9	684.8	-0.6
Parcel	95.4	118.6	24.3
Rail	83.5	74.3	-11.0
Air Freight	88.5	96.5	9.0
Water	36.6	26.1	-28.6
Pipeline	57.8	58.8	1.7
Inventory Carrying Costs	448.9	381.6	-15.0
Other Costs	122.9	116.9	-4.9
Total	1,622.4	1,557.5	-4.0

Source: CSCMP's 32nd Annual State of Logistics Report 2021

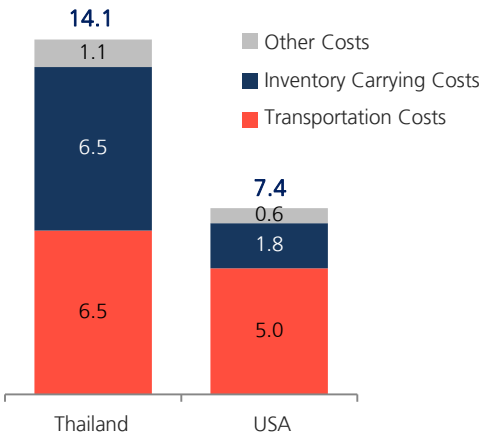
2) Inventory Carrying Costs

Inventory carrying costs are about 381.6 billion USD (a 15.0% fall from last year) owing to their high volatility in the first half of the year and a sign of recovery in the second half. The recovery results from the gradual economic revival and financial support measures, including Economic Injury Disaster Loan (EIDL) and Paycheck Protection Program (PPP). The EIDL is a low-interest loan to help small businesses during COVID-19 by providing up to 10,000 USD to applicants with non-repayment required if the applicant follows EIDL's terms. The PPP provides non-repayment loans to businesses that meet the Small Business Administration (SBA)'s requirements that at least 75% of the loans will be paid to their workers to avoid unemployment and to keep their business running.

3) Other Costs

Other costs are about 116.9 billion USD (a 4.9% fall from last year), which aligns with overall rising logistics costs.

Figure 26 Logistics Cost Ratio of Thailand and The United States of America in 2020

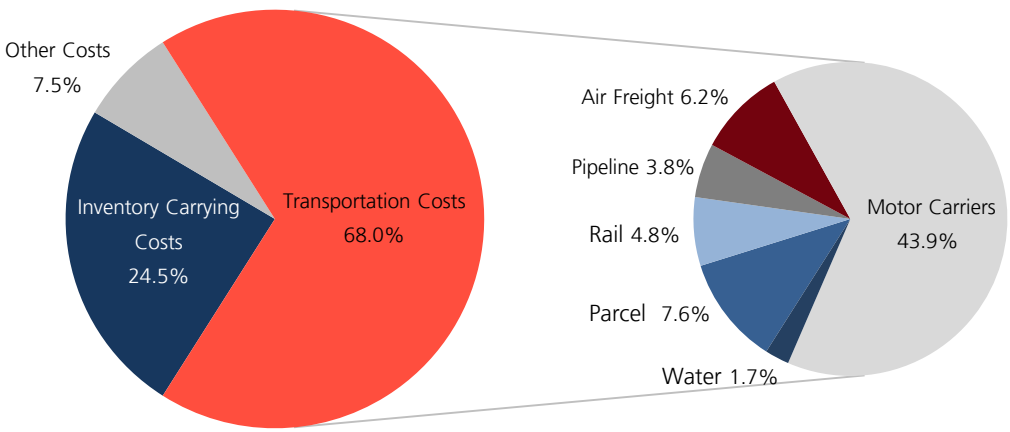


Source: Logistics Development Strategy Division, NESDC

4) US Logistics Cost Structure

US logistics costs consist of transportation costs accounting for 68.0% of total logistics cost, inventory carrying costs for 24.5% and other costs for 7.5% consecutively. The transportation costs are the largest cost component as road freight transport remains the dominant mode.

Figure 27 US Logistics Cost Structure in 2020



Source: CSCMP's 32nd Annual State of Logistics Report 2021

Part 3 Recommendations and Way Forward

Although the global economy is gradually recovering, there are uncertainties and risk factors from the new wave of the COVID-19 outbreak occurring in many countries worldwide. The new outbreak can disrupt both economic and logistics activities, expedite technology development, and impact future development. Thus, Thailand's logistics system development guidelines for the next phase should emphasize the technology and innovation adoption for logistics service and management efficiency as well as logistics information integration for risk management planning and in preparation for changes. The management and utilization of infrastructure and logistics facilities to maximize efficiency and reduce overall logistics costs should also be one of the focus areas. Recommendations and way forward are as follows:

1. Adopt technology and innovation to enhance logistics management efficiency, and adapt business operations and services to align with e-commerce trends.

1.1 Promote Thai entrepreneurs to adopt technology and innovation to enhance efficiency in their business operations and logistics management.

Boost the potential of Thai entrepreneurs, both agricultural and industrial sectors, and logistics service providers with knowledge, skills, and other supporting factors. Ease access to finance for the entrepreneurs to adopt technology and innovation to manufacturing processes and logistics activities for value addition. Improve management efficiency of automated warehouse systems, tracking systems, traceability systems, cold chain management systems, etc. Enhance operational management of raw material, production, and packaging along with business services by considering standardization, safety, and public health measures. Promote entrepreneurial networks throughout both domestic and international supply chain linkage.

1.2 Encourage the entrepreneurs to adapt their operations and logistics services to align with e-commerce trends.

Encourage Thai entrepreneurs to adjust their operations and logistics services to align with e-commerce trends as consumers gain increasing interest in online shopping, especially during post-COVID-19. Employ application or online platform to expand market channels and service development as well as link relevant data to improve the efficient management of transportation, warehousing, and inventory holding together with logistics activities throughout the supply chain. Enhance logistics services to be in accordance with cross-border e-commerce activities.

2. Integrate and facilitate up-to-date logistics information exchanges especially in the times of crisis.

Develop a logistics information exchange platform to provide Thai entrepreneurs with up-to-date data and information in preparation for unexpected changes, especially during a crisis. The data and the information include imports and exports, international freight transportation, international logistics-related activities, and laws and regulations of their trading partners. Encourage the entrepreneurs to employ the information as a tool for business analysis, monitoring and evaluation, and risk management planning along with simulation modelling to create the adjustment of marketing strategy in response to changes in market trends.

3. Manage and increase the utilization of infrastructure, logistics facilities, and supporting factors.

3.1 Manage and increase the efficient use of logistics infrastructure.

Improve logistics operations and increase the utilization of the rail system as a national transportation backbone along with feeder shipping networks and logistics facilitation. Connect logistics infrastructure (including dry port and logistics park) to agricultural and industrial sources, and gateways, especially international ports, and important border checkpoints. Encourage private sector involvement in infrastructure management and service development to stimulate the growth of domestic economic and logistics activities. Facilitate transit transport routes linking both regions and sub-regions, namely, the CLMV (Cambodia, Lao PDR, Myanmar, and - Vietnam) and Southern China.

3.2 Develop electronic information exchange systems of import and export procedures and accelerate the full use of the systems.

Expedite the National Single Window (NSW) development that enables electronic data linkage between government to government (G2G) and business to government (B2G) to facilitate the paperless customs procedures along with all transaction monitoring. Increase the NSW utilization to cut down on unnecessary documents. Connect Port Community System (PCS) to NSW to link import-export data relevant to water and air freight transportation. Develop Thailand's National Digital Trade Platform (NDTP) to link business-to-business (B2B) international trade information. Improve related legal and regulatory mechanisms to be in line with the Trade Facilitation Agreement (TFA) and Word Trade Organization (WTO).

Appendix 1: Thailand's Logistics Cost and Logistics Cost to GDP from 2011-2020e

By Logistics Information Development Working Group

Unit: Billion Baht

Logistics Cost	2011	2012	2013	2014	2015	2016	2017r	2018r	2019p	2020e
Transportation Cost	**850.3**	**932.2**	**953.4**	**994.9**	**1,016.3**	**1,078.3**	**1,049.5**	**1,105.3**	**1,101.7**	**1,021.8**
Pipeline	36.5	39.4	35.6	49.6	43.6	51.9	62.4	67.2	61.1	53.8
Rail	1.9	2.1	2.1	1.8	1.9	2.1	2.1	2.1	2.0	1.9
Road	511.6	554.5	562.3	577.1	590.9	631.0	559.0	567.6	563.9	518.7
Water	167.8	201.8	203.6	205.0	220.4	224.3	233.2	243.0	238.6	232.0
Air	42.3	41.4	41.1	39.5	36.4	39.7	42.4	46.1	38.9	13.0
Transport-Related Services	70.6	76.1	87.1	97.9	99.8	103.9	113.7	131.3	139.0	144.5
Postal Services	19.6	16.9	21.6	24.0	23.4	25.4	36.7	48.2	58.2	57.8
Inventory Holding Cost	**662.7**	**682.9**	**713.9**	**711.2**	**724.1**	**743.1**	**880.4**	**924.1**	**964.5**	**1,029.1**
Inventory Carrying Cost	650.6	668.1	696.2	696.8	709.2	730.1	689.0	732.3	773.4	839.4
Warehousing Cost	12.1	14.8	17.7	14.4	14.9	13.0	191.4	191.8	191.0	189.7
Logistics Administration Cost	**151.3**	**161.5**	**166.7**	**170.6**	**174.0**	**182.1**	**155.2**	**163.2**	**166.1**	**164.9**
Total Logistics Cost	**1,664.3**	**1,776.6**	**1,834.0**	**1,876.7**	**1,914.5**	**2,003.5**	**2,085.0**	**2,192.6**	**2,232.3**	**2,215.7**
Gross Domestic Product (GDP)	**11,306.9**	**12,357.3**	**12,915.2**	**13,230.3**	**13,743.5**	**14,554.6**	**15,488.7**	**16,368.7**	**16,898.1**	**15,702.9**
Unit: Percent to GDP										
Proportion of Logistics Cost to GDP	**2554**	**2555**	**2556**	**2557**	**2558**	**2559**	**2560r**	**2561r**	**2562p**	**2563e**
Transportation Cost to GDP	7.5	7.6	7.4	7.5	7.4	7.4	6.8	6.8	6.5	6.5
Inventory Holding Cost to GDP	5.9	5.5	5.5	5.4	5.2	5.1	5.7	5.6	5.7	6.5
Logistics Administration Cost to GDP	1.3	1.3	1.3	1.3	1.3	1.3	1.0	1.0	1.0	1.1
Logistics Cost to GDP	**14.7**	**14.4**	**14.2**	**14.2**	**13.9**	**13.8**	**13.5**	**13.4**	**13.2**	**14.1**

Source: NESDC

Remark : r refers to revised data

p refers to preliminary data.

e refers to estimated data.

Besides, 2017-2020 logistics costs are based on the revised cost assumptions from The Improvement of Thailand's Logistics Cost Calculation Model in fical year 2018 jointly conducted by NESDC and TU-RAC.

Appendix 2: Transportation Cost to GDP by Components from 2011-2020e

By Logistics Information Development Working Group

Unit: Percent to GDP

Logistics Cost	2011	2012	2013	2014	2015	2016	2017r	2018r	2019p	2020e
Transportation Cost	**7.5**	**7.6**	**7.4**	**7.5**	**7.4**	**7.4**	**6.8**	**6.8**	**6.5**	**6.5**
Pipeline	**0.3**	**0.3**	**0.3**	**0.4**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**
Rail	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Road	**4.5**	**4.6**	**4.4**	**4.4**	**4.3**	**4.3**	**3.6**	**3.5**	**3.3**	**3.3**
Water	**1.5**	**1.6**	**1.6**	**1.5**	**1.6**	**1.5**	**1.5**	**1.5**	**1.4**	**1.5**
Air	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.1**
Transport-related Services	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**
Parcel Services	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.4**

Source: NESDC

Remark : r refers to revised data

p refers to preliminary data.

e refers to estimated data.

Besides, 2017-2020 logistics costs are based on the revised cost assumptions by NESDC and TU-RAC.

Appendix 3: Trends of Logistics Costs Growth and GDP between 2011-2020e

By Logistics Information Development Working Group

Unit: Percent

Logistics Cost	2011	2012	2013	2014	2015	2016	2017r	2018r	2019p	2020e
Transportation Cost	**4.6**	**9.6**	**2.3**	**4.4**	**2.1**	**6.1**	**-2.7**	**5.3**	**-0.3**	**-7.3**
Pipeline	22.1	7.9	-9.6	39.3	-12.2	19.1	20.4	7.5	-9.0	-12.0
Rail	-9.5	10.5	0.0	-14.3	3.0	13.3	0.7	-3.0	-4.1	-6.0
Road	5.0	8.4	1.4	2.6	2.4	6.8	-11.4	1.5	-0.7	-8.0
Water	0.4	20.3	0.9	0.7	7.5	1.8	3.9	4.2	-1.8	-2.8
Air	5.7	-2.1	-0.7	-3.9	-7.9	9.1	6.8	8.7	-15.6	-66.5
Transport-related Services	6.0	7.8	14.5	12.4	1.9	4.1	9.4	15.5	5.9	4.0
Parcel Services	-1.0	-13.8	27.8	11.1	-2.5	8.5	44.1	31.4	20.8	-0.7
Inventory Holding Costs	**-2.5**	**3.0**	**4.5**	**-0.4**	**1.8**	**2.6**	**18.5**	**5.0**	**4.4**	**6.7**
Inventory Carrying Cost	-2.6	2.7	4.2	0.1	1.8	2.9	**-5.6**	**6.3**	**5.6**	**8.5**
Warehousing Costs	0.0	22.3	19.6	-18.6	3.5	-12.8	**1,371.2**	**0.2**	**-0.4**	**-0.7**
Logistics Administration Cost	**1.3**	**6.7**	**3.2**	**2.3**	**2.0**	**4.6**	**-14.8**	**5.2**	**1.8**	**-0.7**
Total Logistics Cost	**1.4**	**6.7**	**3.2**	**2.3**	**2.0**	**4.7**	**4.1**	**5.2**	**1.8**	**-0.7**
Gross Domestic Product (GDP)	**4.6**	**9.3**	**4.5**	**2.4**	**3.9**	**5.9**	**6.4**	**5.7**	**3.1**	**-7.0**

Source: NESDC

Remark : r refers to revised data

p refers to preliminary data.

e refers to estimated data.

Besides, 2017-2020 logistics costs are based on the revised cost assumptions by NESDC and TU-RAC.

Appendix 4: Thailand's Value Added from Logistics activities between 2011-2020e

By Logistics Information Development Working Group

Unit: Billion Baht

Value Added	2011	2012	2013	2014	2015	2016	2017r	2018r	2019p	2020e
Pipeline	32.4	29.0	25.5	36.1	31.4	52.5	48.3	52.1	46.8	41.2
Rail	0.6	0.3	0.2	0.6	0.4	0.8	0.8	1.3	1.0	0.9
Road	106.3	117.9	118.0	119.0	135.9	139.4	146.6	149.0	152.4	142.4
Water	83.1	93.4	97.5	98.9	105.5	107.8	111.3	115.7	115.0	114.3
Air	26.1	28.5	29.1	28.7	30.2	35.9	39.9	43.0	39.7	32.1
Transport-related Services	40.4	45.8	49.6	55.6	56.6	59.2	64.8	74.9	84.4	87.8
Parcel Services	12.3	12.9	13.6	14.8	15.7	19.7	24.9	30.5	38.9	50.0
Warehousing	7.5	9.0	10.8	8.8	9.1	8.4	8.5	8.5	8.7	8.8
Total Value Added	**308.7**	**336.8**	**344.3**	**362.5**	**384.8**	**423.7**	**445.0**	**474.9**	**487.0**	**477.4**
Gross Domestic Product (GDP)	**11,306.9**	**12,357.3**	**12,915.2**	**13,230.3**	**13,743.5**	**14,554.6**	**15,488.7**	**16,368.7**	**16,898.1**	**15,702.9**

Source: NESDC

Remark : r refers to revised data

p refers to preliminary data.

e refers to estimated data.

Appendix 5: Trends of Value Added from Logistics activities between 2011-2020e

By Logistics Information Development Working Group

Unit: Billion Baht

Value Added	2011	2012	2013	2014	2015	2016	2017r	2018r	2019p	2020e
Pipeline	8.2	-10.5	-12.3	42.0	-13.0	67.2	-8.1	7.9	-10.2	-12.0
Rail	-24.2	-39.0	-29.3	131.5	-30.5	97.2	9.7	51.1	-20.9	-4.8
Road	3.0	10.9	0.1	0.8	14.2	2.6	0.7	1.6	2.3	-6.6
Water	-0.1	12.4	4.4	1.4	6.7	2.2	3.2	4.0	-0.6	-0.6
Air	1.7	8.9	2.2	-1.2	4.9	18.9	11.3	7.7	-7.6	-19.6
Transport-related Services	5.9	13.2	8.4	12.2	1.8	4.6	9.4	15.6	12.8	3.9
Parcel Services	-10.5	5.3	5.4	8.5	6.2	25.2	26.7	22.3	27.8	28.3
Warehousing	-0.6	20.9	19.8	-18.9	3.6	-7.6	1.0	0.3	2.5	0.4
Total Value Added	2.2	9.1	2.2	5.3	6.1	10.1	3.5	6.7	2.5	-2.0
Gross Domestic Product (GDP)	4.6	9.3	4.5	2.4	3.9	5.9	6.1	5.7	3.2	-7.1

Source: NESDC

Remark : r refers to revised data

p refers to preliminary data.

e refers to estimated data.

Working Group

National Accounts Division
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