



Evaluating Vietnam's Logistics Market Potential:

Logistics Market Profile and Technology Transition to Efficient Supply Chain Management

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Vietnam's Logistics Market Profile

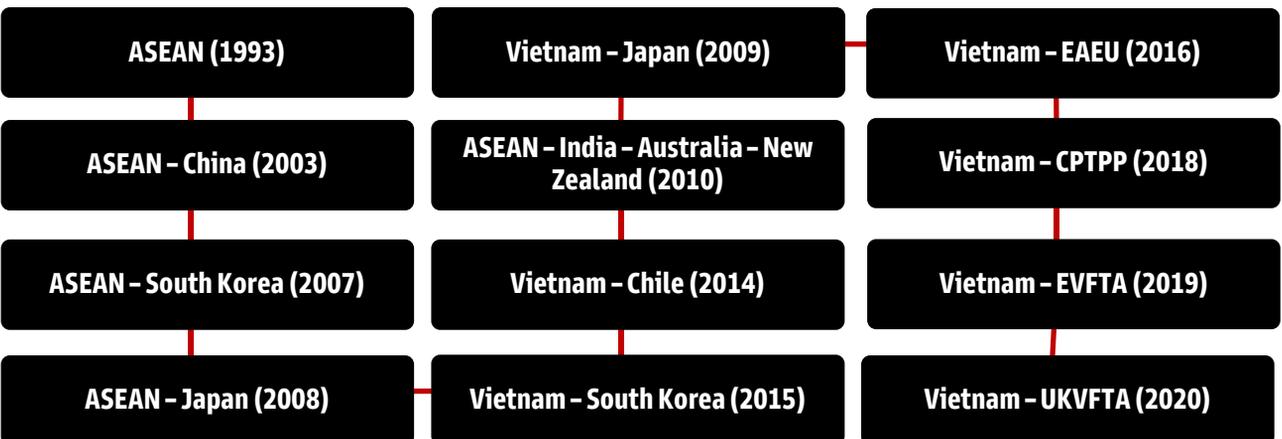
Vietnam's logistics industry presents a whole range of opportunities from the growth of **export-oriented manufacturing**, the country's **participation in free trade agreements** with a number of overseas countries to strong **development of e-commerce**.

Despite increasing protectionism worldwide, Vietnam's exports continue to grow on an annual basis. Vietnam's exports have increased by an average of 11% per annum from 2015 to 2020. In 2020, the trade surplus in Vietnam amounted to approximately US\$19.95 billion, up 83% vs. 2019.

Free trade agreements have been one of key incentives in broadening the country's export markets and trading partners by allowing lower tariffs to domestic manufacturers. Among Vietnam's notable free trade agreements are the European Union-Vietnam Free Trade Agreement (EVFTA), Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), and UK-Vietnam Free Trade Agreement (UKVFTA). With active establishment of trade agreements, Vietnam has seen an influx of foreign manufacturers to the country. Recent free trade agreements have also accelerated exports to countries outside ASEAN in the past few years and this trend is expected to continue in the coming years.

In 2020, the manufacturing sector in Vietnam accounted for 48% of the total registered foreign direct investment (FDI), making it the leading sector in the country. FDI companies have played a key role in the growth of exports. Approximately 72%, or US\$203 billion, of exports originated from FDI companies in 2020.

Figure 3: Vietnam's Free Trade Agreements



Sources: Center for WTO and International Trade - VCCI, WTO, General Statistics Office of Vietnam, CEIC, VinaCapital,

Figure 1: Main export trade partners of Vietnam in 2020, by trade value

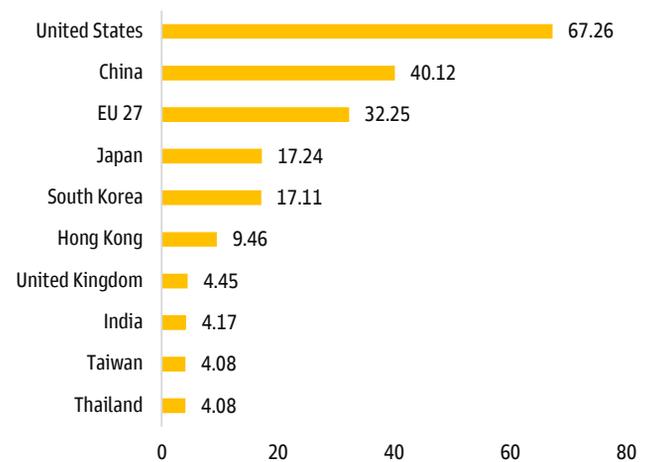
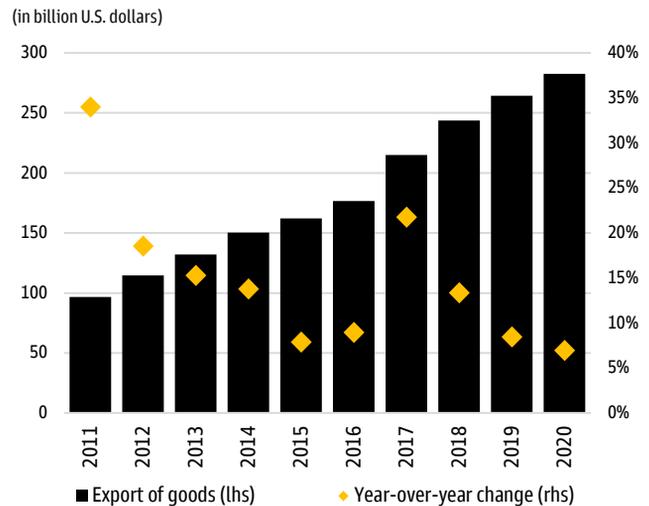


Figure 2: Vietnam: export of goods from 2011 to 2020*



*lhs - left hand side; rhs - right hand side

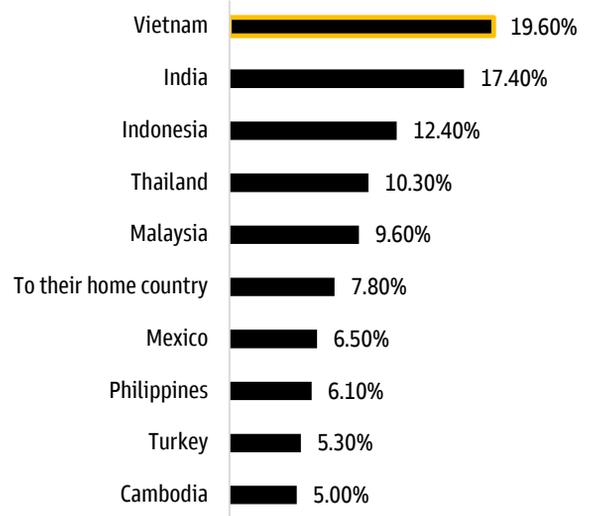
Vietnam's Logistics Market Profile

The COVID-19 pandemic and the protracted US-China trade conflict exposed **vulnerabilities of the supply chain** across nearly every industry. Many industrial companies have undervalued the risk of **over-reliance on a single production base**, which has been mainly China – the world's largest manufacturer. As the result of the shocks to supply chains in recent years, more manufacturers have sought to reduce their exposure to the risks by diversifying their dependence on China and relocating production to other markets – a strategy known as **"China Plus One"**. Vietnam has been viewed as a viable and cost-effective alternative to China by many manufacturers.

The development of new industrial zones has also played a key role in the growth of logistics by incentivizing its major clientele group – foreign manufacturers – to consider Vietnam. Vietnam's industrial zones are spread out across the country and are mainly concentrated within 4 key economic regions: Northern Key Economic Region, Central Key Economic Region, Southern Key Economic Region and Mekong Key Economic Region. In the country's 374 industrial zones, there are 329 industrial parks, which demonstrate heightened demand with occupancy rates of 70%-99% (2020 year-end), depending on the province.

There are around **700 distribution & logistics facilities** operating in the country. Vietnam's logistics property market is, however, in the comparatively early stages of development compared to more developed markets such as European Union and, hence, has considerable room for improvement. In terms of size, distribution & logistics facilities include modern properties of 2,000 sqm or larger in Vietnam, while in more developed logistics markets of European Union distribution & logistics facilities are mainly represented by big-box logistics properties of over 5,000 sqm. In addition, distribution & logistics facilities in Vietnam usually include properties with height of over 6 m, loading floor capacity of 5,000 kg/sqm and allow any number of loading docks vs. height of over 10 m, loading floor capacity of over 5,000/sqm and common requirement of over 5 loading docks in European Union. To increase

Figure 4: If companies move operations from China, where are they most likely to relocate?*



*The survey was performed in September-December 2020; 1,206 logistics industry professionals participated in the survey

Figure 5: Industrial parks occupancy rate in Vietnam in 2020, by province

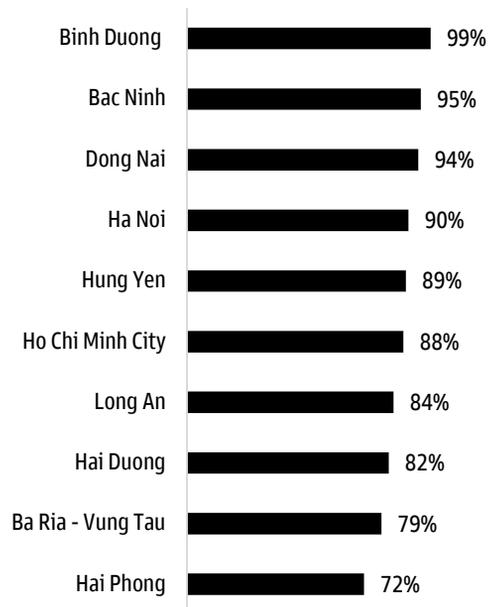
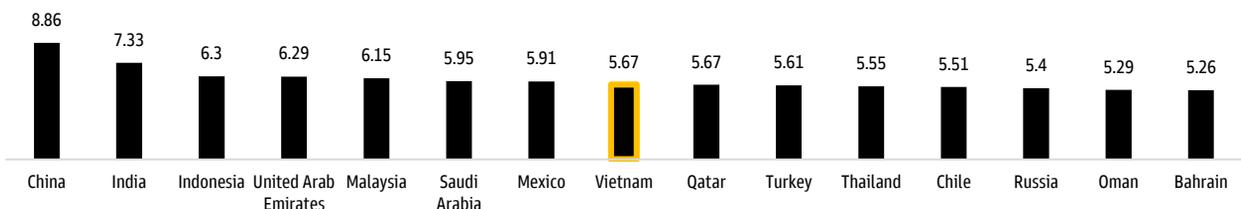


Figure 6: Leading emerging logistics markets in 2021 based on the Agility Emerging Markets Logistics Index



Sources: Agility Insights, VnExpress, Savills, Transport Intelligence, Vietnam Industrial Zone Portal, Vynn Capital

Vietnam's Logistics Market Profile

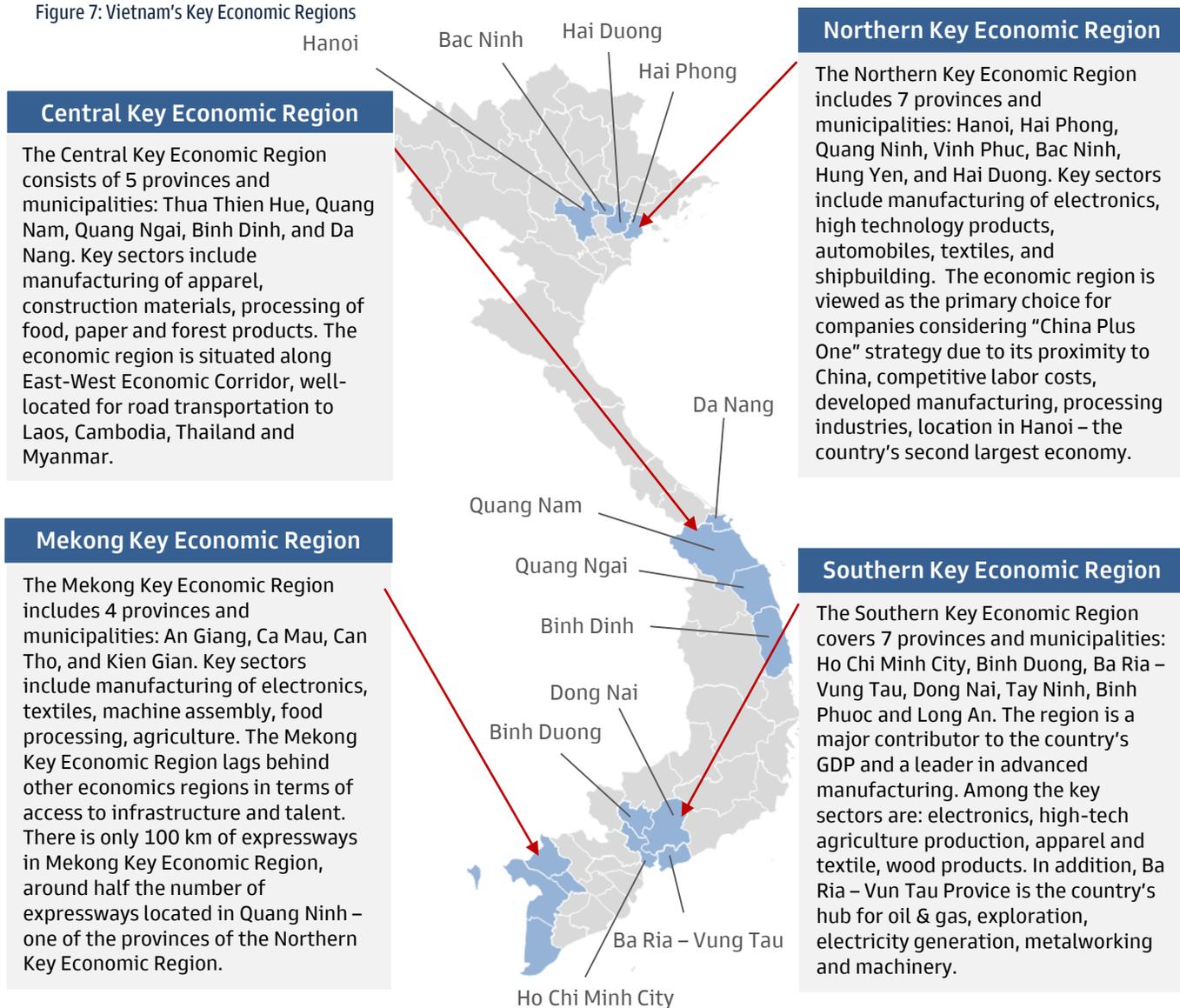
the supply of top-quality projects, the Vietnamese government encourages new construction and tends to approve new locations and investments quickly to meet the vigorous demand in the industrial and logistics markets. As more developers focus on delivering top-quality logistics real estate, the competition between existing logistics properties and new projects of larger dimensions will be intensified.

In Vietnam, demand for rentable distribution & logistics facilities mainly comes from such sectors as: Manufacturing, Industrial & Energy; Wholesale & Retail; 3PLs and Transportation. Depending on the region,

Wholesale & Retail and 3PLs & Transportation sectors may account for 30%-50% of leasing demand each, while Manufacturing, Industrial & Energy sector represents 15%-30%. Such structure of leasing demand for distribution & logistics facilities demonstrates the key role of 3PLs & Transportation providers in Vietnam's supply chain.

E-commerce has been another **key driver of demand for logistics services** in Vietnam. The growth of e-commerce has been a continuing trend in Vietnam, with e-commerce market value rising by an average of **26% on an annual basis** between 2015 and 2020.

Figure 7: Vietnam's Key Economic Regions



Sources: Vietnam Briefing from Dezan Shira & Associates; Fullbright University Vietnam

Vietnam's Logistics Market Profile

In 2020, Vietnam ranked only after Indonesia, Thailand, and Singapore by the value of e-commerce market value in Southeast Asia. Additionally, the share of e-commerce in retail sales increased by 0.6 p.p. year-over-year to 5.5% alongside the growth of internet users by 11% year-over-year. With the volume of products being distributed rising, logistics companies will continue acquiring new clients in the form of online shopping firms looking to expand.

Vietnam ranked as the **most attractive destination for relocation** among logistics companies in the Agility 2020 Logistics Emerging Markets Survey. Almost 20% of logistics industry professionals mentioned Vietnam as the most likely country to move their operations from China. Hence, the sentiment among logistics players indicates the positive forecast of demand for logistics services in the coming years. In addition, in the Agility Emerging Markets Logistics Index 2021 (Figure 6), Vietnam moved up three places and displaced Thailand in the top 10.

Vietnam's logistics market is characterized by **widespread fragmentation**, and the majority of logistics operators are small- and medium-sized enterprises offering low-value-added logistics services. Out of the total of 3,000 logistics operators, **90% have reported a registered capital of less than US\$430,000**, while only 5% have stated a registered capital between US\$430,000-US\$860,000 and the rest - US\$860,000. Foreign players dominate the Vietnamese logistics market and account for 70%-80% of the market's revenue.

Figure 9: E-commerce market value in Vietnam from 2015 to 2020

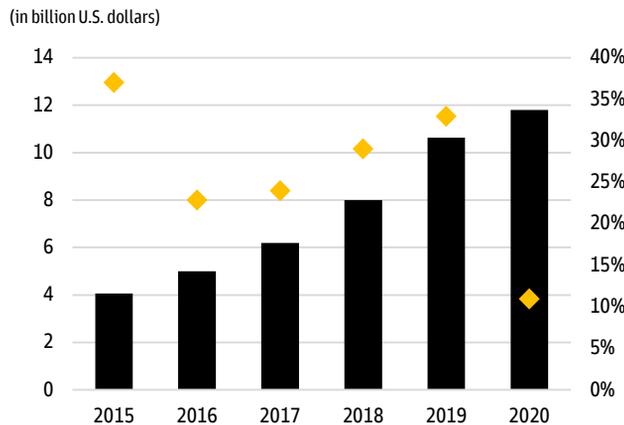
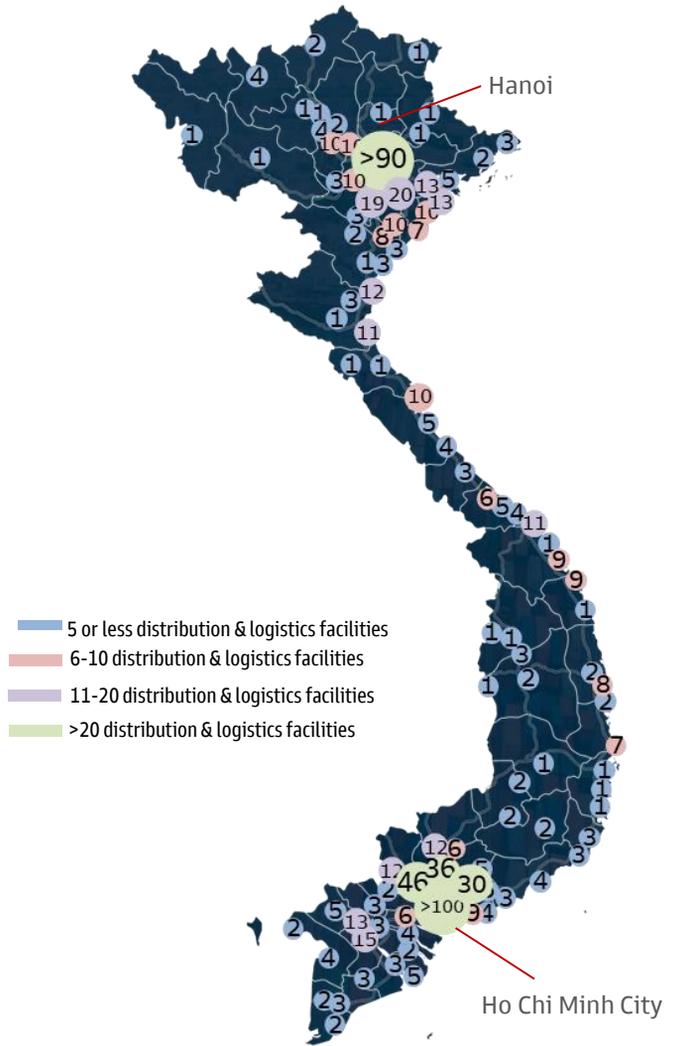
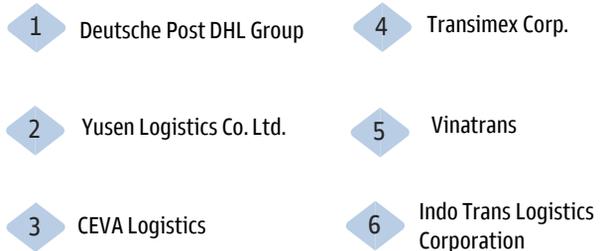


Figure 8: Map of Geographical Distribution of Modern Distribution & Logistics Facilities¹ in Vietnam by Locations



¹ Usually large purpose built facilities (>2,000 sqm) located at major ports, road junctions, etc. Some characteristics may include: loading bays, high ceiling height (>6m), low total site coverage (<50%).

Figure 10: Major logistics players in Vietnam



■ E-commerce market value in Vietnam (lhs) ◆ Year-over-year change (rhs)

Sources: Vietnam's Ministry of Industry and Trade, iDea, Vietnam E-commerce Association, Vietnam Industrial Zone Portal, Vynn Capital, Mordor Intelligence

Vietnam's Logistics Outlook

Outlook for Vietnam's logistics sector is **positive** owing to ongoing government support for the development of key components of the logistics industry - transportation networks and industrial zones. Recent master plans announced by the Ministry of Transport and the Ministry of Planning and Investment demonstrate the prioritization of these infrastructure components to accommodate the growing manufacturing industry in the country.

With the increasing trade volume and growing manufacturing, transport infrastructure becomes essential for the development of the logistics industry. The construction of new expressways is especially important for the development of logistics as the country's road network accounts for the majority of freight transportation (70%-80%) in the country. Currently, Vietnam lacks infrastructure due to the fast-paced economic growth and ranked 80th out of 136th countries in the 2019 Infrastructure Quality Index by World Economic Forum. However, to accommodate the manufacturing demand, Vietnam's government has actively worked on programs for expansion of the country's intermodal transport network links. In 2021 Vietnam's Transport Ministry announced a 2030 master plan to build 5,000 km of expressways to limit route overburdening and improve road connectivity, especially along north-south expressway on the country's eastern side and with Laos, China, Cambodia, and Myanmar. Other programs in the master plan included prominent projects such as the development of a deepwater port in Hai Phong, high-speed rail routes along north-south industrial zones, completion of Long Thanh International Airport near Ho Chi Minh City.

The Department of Economic Zone Management (DEZM) of the Ministry of Planning and Investment also approved further construction of 561 industrial zones (~201,000 ha) together with the master plan to complement older industrial zones with supporting, associated, and combined industrial zones. These government projects are essential for attracting foreign direct investments and relocations of manufacturers. By 2025, Vietnam is anticipated to have 1,704 industrial clusters vs. 968 industrial clusters in 2020.

Ongoing refinement of policies, strategic planning of industrial and transportation infrastructure, provision of incentives for manufacturers provide favorable conditions for the growth of logistics in Vietnam. By 2025, Vietnam is expected to achieve an annual growth rate of 20% in the logistics services.

Sources: Fiin Group, Ministry of Industry and Trade

Figure 11: Total length of new expressways planned in Vietnam from 2016 to 2019 (in kilometers)

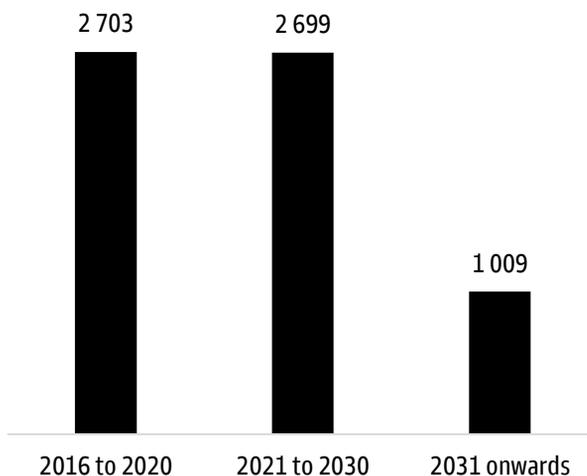
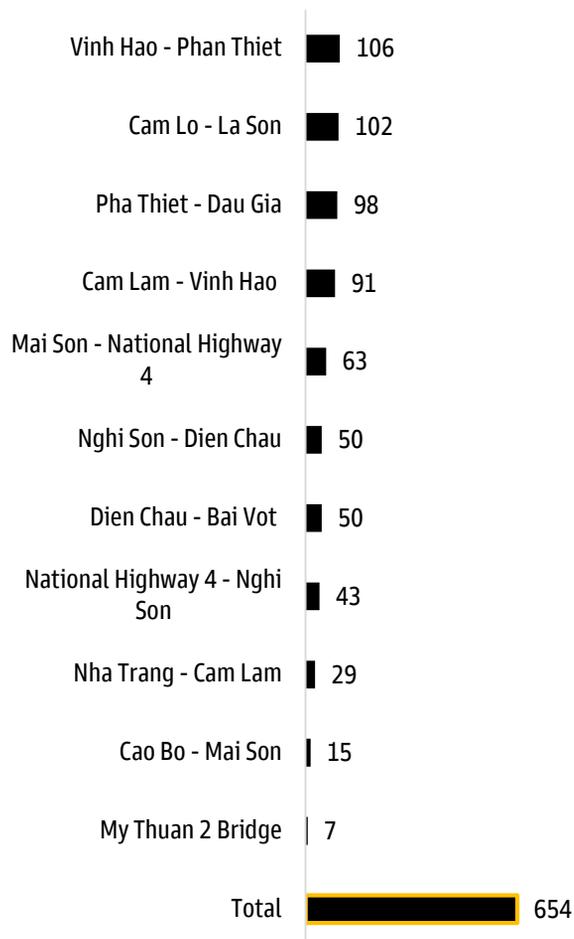


Figure 12: Length of new expressway route development projects in Vietnam from 2019 to 2020 (in kilometers)



Emergence of Technology-Enabled Logistics in Vietnam

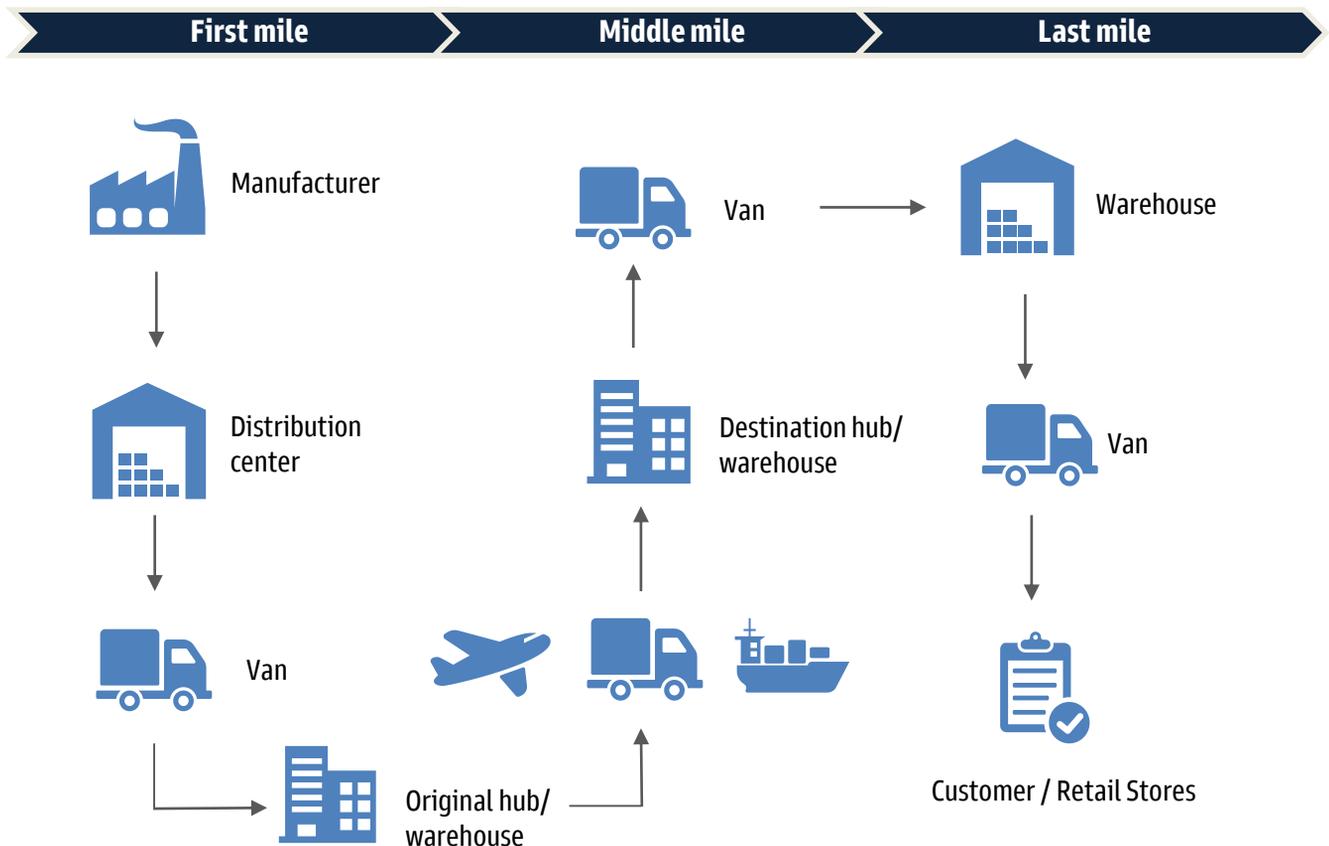
Logistics is the **backbone of Vietnam's economy** and one of the eight sectors included in the national digital transformation program by 2025. In 2020, the logistics sector accounted for 20% of the country's GDP, while the figure for developed countries stood at 8%-14%. The main reason behind high logistics costs in Vietnam has been the **lack of cost reduction efforts**. However, as more logistics companies strive for efficiency due to rising trade volumes, growing e-commerce, and fierce competition, digitalization becomes a critical component of the logistics sector.

In Vietnam, **gradual digitalization has been observed across supply chain services** from first to last mile deliveries. More specifically, first mile delivery is the transportation of completed goods from the manufacturing facility to a distribution center. First mile delivery is followed by middle mile delivery, which is the transportation from distribution center to destination hub / warehouse. Last mile delivery is the final step, in which items

are delivered from shipping warehouse to the end customers home.

As highlighted previously, the majority of shipments in Vietnam are handled by trucking companies. With Vietnam's trucking market remaining highly fragmented, the comparison of **transportation prices has been an obstacle** for Vietnam's small- and medium-sized enterprises with **limited access to delivery solutions**. However, we have seen a significant number of local logistics startups emerging over the last decade to address delivery issues, including Loglag (on-demand trucking and container booking platform) EcoTruck (on-demand trucking marketplace for first mile delivery), Logivan (on-demand trucking marketplace for first and middle mile delivery), Giaohangtietkiem (on-demand trucking marketplace for last mile delivery), Ship60 (on-demand trucking and motorcycle marketplace for last mile delivery), and Ship247 (platform which connects third-party-logistics providers, such as aviation or trucking services

Figure 13: Component-wide view of supply chain



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operators to offerings to provide nationwide and international express deliveries). Additionally, in recent years, more **foreign delivery startups** have also entered Vietnam's logistics market, such as Indonesia's J&T Express (on-demand trucking with a focus on lower-tier cities) in 2017, Hong Kong's Lalamove (on-demand trucking marketplace for last mile delivery) in 2018 and GoGox (on-demand tricycle and car marketplace for last mile delivery) in 2019, China's Best Express (on-demand trucking marketplace for last mile delivery) in 2019 and others. The surge in the number local and foreign first, middle, and last mile delivery startups entering Vietnam has been supported by sustainable demand from Vietnam's growing small- and medium-sized enterprise market.

Warehousing & fulfillment is another part of a logistics value chain that has been developing in Vietnam. We have observed the emergence of such disruptors as Singapore-headquartered Anchanto and Vietnam-headquartered Boxme that allow small and medium-sized enterprises in the country to access efficient storage solutions, despite small sizes. Both companies provide transportation and delivery, warehousing, cross-borer fulfillment services to China and Southeast Asian countries. Anchanto and Boxme store sellers' products in their warehousing networks and deliver them to final destinations when the end consumer places an order.

As the majority of transportation companies in Vietnam are represented by SMEs with a registered capital below US\$430,000, **affordable solutions for logistics optimization are well sought after**. One prominent logistics startup that leverages artificial intelligence to provide cost-effective OMS, TMS, WMS solutions is Abivin. Abivin helps its clients to optimize transportation plans, maximize vehicle fill rate and manage teams efficiently. The startup provides different packages for clients of different sizes from SMEs to large enterprises. Abivin's TMS solution is tailored to satisfy the needs of 5 sectors in the supply chain: manufacturers, carriers, distributors, retailers and container freight. Abivin's products can be also integrated with ERP and Telematics systems, including SAP, Oracle, Microsoft, to achieve a connected supply management workflow. According to Abivin's statements, Abivin's solutions allows clients to save up to 40% of costs with its route optimization and vehicle capacity maximization. Among other

notable TMS providers in Vietnam are India's Locus and Vietnam's Smartlog. India's Locus has been scaling globally with clients across North America, Southeast Asia, Europe, and India. The company provides a wide variety of AI-driven logistics solutions for e-commerce, reverse/return logistics, 3PLs, retail, CPG & FMCG. In addition, Vietnam-headquartered Smartlog is a leading provider of TMS, WMS, and transport exchange platform for the Southeast Asia's clients. Smartlog's TMS currently optimizes routes of over 10,000 trucks while its WMS covers over 800,000 of warehouse space.

It is also worth mentioning Singapore-headquartered Inteluck which provides a variety of data-driven logistics to clients in Vietnam, Thailand, China, Philippines and other SEA countries. Under a marketplace model, Inteluck offers trucking services to medium- and large-sized companies. The company's services also include warehousing, air & ocean freight and logistics optimization solution. To optimize logistics processes, Inteluck combines real-time data from a broad range of external sources such as road conditions and weather with the use of IoT devices across logistics fleet.

Over the recent years, we have seen a transformation of Vietnam's logistics. The logistics network supported by technology solutions has been formed across supply chains and provided access to more services for the largest share of logistics players – small- and medium-sized enterprises – in the country. With the number of delivery platforms surging in Vietnam, we anticipate more players to look for logistics optimization solutions to bring more efficiency, transparency, and consistency to the supply chains. With price being a key factor in decision-marketing, the largest share of Vietnam's logistics companies – SMEs specialized in truckload shipping – are likely to look for cost-effective logistics optimization services (OMS, WMS, TMS) on a subscription basis rather than developing them in-house, creating more opportunities for such startups as Abivin or Smartlog. Along with the shift of foreign manufacturing to Vietnam and increasing number of SMEs, we remain a positive outlook for the development of the logistics market in Vietnam and expect the accelerating growth of logistics technology startups, across all segments of the supply chain.

Emergence of Technology-Enabled Logistics in Vietnam

Selected Players of Vietnam's Logistics Technology Landscape

Trucking and Fleet



Last Mile Delivery



Warehousing & Fulfillment



OMS, TMS & WMS SaaS



Integration of Technology Into Logistics

Recent years have seen the development of a wide range of technological solutions emerging in the logistics sector. Supply chain disruptions, growing volumes of freight force logistics companies to adopt digital solutions to reduce reliance on human employees and protect their business from the disruption of goods supply and shipping. We have outlined key technology tools that are being gradually adopted by warehousing & fulfillment and transportation players to increase efficiency, maintain stability and ensure business continuity.

Warehousing Automation

In warehousing, the sought-after solutions include robotics and AI-controlled automation systems to fulfill inventory management, sortation, order picking, scheduling, and distribution. Automation solutions for warehouses have proven effective in the Asia Pacific. Alibaba's logistics arm Cainiao specialized in developing unmanned logistics and service centers, recorded an increase in efficiency of around 50% in its logistics center in Wuxi compared to traditional logistics centers. Another leading player in warehousing automation JD.com has been rapidly expanding its warehouse portfolio and has built 25 robotic logistics facilities in Mainland China and recently completed an automated warehouse in Singapore. As reasons to automate warehousing automation are compelling, more fast-paced adoption of robotics and AI-controlled automation systems is expected.

The key technologies which are being integrated into logistics & distribution facilities include:

- **Indoor Inventory Drones.** Indoor inventory drones are used for recording of stock in the logistics & distribution facilities. Inventory drones fly to the pallet spaces and check packages within shelf gangways by taking high-end resolution photos and assessing the labels. This solution significantly helps to decrease costs for stocktaking, a process that adds little value. Inventory drones also increase safety of employees as they do not have to work at dangerous heights any longer. Some of SEA's notable startups that provide inventory drones are Hope Technik (Singapore) and Infinium Robotics (Singapore).
- **Robotic Arms.** Robotic arm technology in logistics is another hot topic as more companies
- look to automate their backend. Incorporated with artificial intelligence and cameras that perceive depth and color, robotic arms mimic a worker's hand-eye coordination and use grippers of different sizes to pick up objects. Robotic arms help to automate the process known as picking (loading and unloading of pallets), which represents the highest labor cost at distribution & logistics centers. The technology also increases the health & safety standards as employees no longer need to lift heavy objects themselves. Danish startup On Robot, specializing in end-of-arm tools, is a recent player that has entered SEA's market, aiming to leverage on the increasing demand for warehouse robotics in the region.
- **Beacon Technology for Loading or Picking.** Beacon technology ensures error-free loading or picking at logistics facilities. Beacon technology is integrated into warehouse management systems. Beacons are small Bluetooth low-energy devices that are placed above loading gates and communicate with employees' handheld terminals. The operators need to scan the pallet scheduled to be loaded and receive short messages via mobile devices on the loading gate destination. As soon as the mobile operators drive through the expected loading gate, the loading is validated in the system. Loading with beacons also allows effective monitoring of operations as the time period is registered in the system and warehouse operators are then able to see images or videos of the given loading event. The French company Edentic is one of the leading experts in the field of traceability that provides Beacon technology and serves clients globally.
- **Autonomous Guided Vehicles.** Autonomous guided vehicles have earned an admirable reputation in the automated systems space for logistics. Autonomous guided vehicles are usually connected to the Transport Management Systems and are enabled by laser technology. AGVs receive information on the arrival of pallets via TMS and transfer pallets to the conveyor systems. In this way, AGVs help to improve daily operations of employees by covering bottlenecks. Autonomous forklifts can also perform complex tasks by reaching heights of over 10 m. Among established manufacturers are AGVs for logistics are Casun (China), CoTEK (China), Grenzbach (Germany), and Daifuku (Japan).

Integration of Technology Into Logistics

- **AutoStore.** AutoStore technology enables efficient warehouse organization by providing ultra-high density storage and buffering system. The technology performs direct stacking of bins on top of each other and storage of multiple SKUs in a single bin. Robots later bring individual boxes to the check-out station, where employees pick them up. AutoStore technology helps to optimize available warehouse space. Swisslog (Switzerland) and Dematic (United States) are among the leading global providers of AutoStore technology.
- **Motion Mining Technology.** Motion mining technology anonymously analyzes manual work at warehouses with the help of mobile sensors and deep learning algorithms to find optimization solutions in the field of ergonomics. One of the leading players in this field is German startup MotionMiners. The company provides mobile sensors which are placed on the shelves and worn by employees at warehouses. The sensors create 3,000-4,000 data points per second which are later analyzed by deep learning algorithms to find certain patterns for walking, bending, and picking. The MotionMiners analysis then provides reports with KPIs in order to identify areas suggested for improvement in ergonomics.

Integration of TMS and WMS

Today's supply chain management needs to use real-time data across all stages of supply chain. Warehouse management system (WMS) and transportation management system (TMS) are the key drivers of the automated logistics which help to build a reliable information base and ensure efficient planning of shipments. WMS and TMS are usually integrated simultaneously to achieve the quality planning for the physical flow of goods.

- **WMS/TMS.** The order fulfillment process commences with orders passed from the enterprise resource planning system (ERP) to the order management system (OMS). The orders are later transferred to WMS that carries out the packing of goods. Simultaneously, TMS examines real-time inventory levels and provides loading planning by considering the sizes and weight of shipments to distribute loads according to the center of gravity of the trailer/railcar/vessel and prevent overloading. The planned orders are then passed back to the

WMS, which begins the picking process. Meanwhile, the TMS can choose appropriate carriers for the pick-up of goods. TMS loading and route planning solutions help reduce route planning time, the number of used vehicles, and the length of routes. At the delivery points, drivers update order status and record proof of delivery with electronic signatures with TMS. TMS systems also provide a wide range of reports on orders for logistics operators to identify opportunities for savings.

While WMS/TMS solutions may seem more suited to bigger companies, such as logistics & distribution centers or 3PLs, they are also beneficial for small businesses. Small businesses usually deal with significant volumes of inventory that they need to keep track of. WMS solutions assist SMEs in inventory management and optimization of warehouse space while TMS solutions help these businesses to add more efficiency to the distribution processes of the goods. As Southeast Asia's logistics market comprises of mainly SMEs, more emerging logistics startups provide tools to SMEs to increase efficiency of their operations, namely Abivin (Vietnam), and Quincus (Singapore).

Warehousing & Fulfillment Middlemen

Demand for warehousing & fulfillment has risen substantially due to the rapid growth of e-commerce. In recent years, Southeast Asia has seen more startups sprout up to offer marketplaces for booking of fulfillment services for multi-channel distribution. One of such startups is Singapore's UrbanFox which provides storage solutions and supports end-to-end logistics in Vietnam, China, Malaysia, and Indonesia. Another player is Indonesia's Waresix which is one of the largest logistics startups in the country and reaches over 300 warehouse operators. The smaller and more traditional the customer is, the higher the demand for contract logistics is. With a growing number of SMEs engaged in e-commerce in Southeast Asia, the demand for micro-fulfillment is expected to grow as more SMEs will be looking to optimize their inventory.

Trucking and Fleet

In the context of growing manufacturing and rapid development of e-commerce, the demand for

Integration of Technology Into Logistics

digital freight brokerage has been increasing. As delivery systems in Southeast Asia are mainly fragmented, there is high competition between small independent transportation contractors. In response to this structure of the market, many startups stepped in with solutions. Vietnam's startup Logivan offers a marketplace for matching shippers with truckers who have space. The startup's major focus is on optimizing load to reduce the empty truck return rate. EcoTruck is another Vietnamese startup that has led the truck-hailing sector in the country owing to its ability to provide the most optimal route for its drivers as well as an automated tracking system. With demand for the movement of cargo increasing, companies whose main strength is software may have the opportunity to scale in the region.

Last-Mile Delivery

Subject to significant disruption, last-mile delivery has been getting lots of attention from investors – rightfully so. With the growth of e-commerce, more consumers now expect same-day or instant delivery. As a result, the demand for rapid last-mile delivery services has been spurring high startup activity. Emerging startups have been offering a variety of marketplaces in this segment for booking deliveries via minivans, cars, motorbikes, or bikes. Some of the leading last-mile delivery startups in Southeast Asia are NinjaVan (Singapore), GoGox (Hong Kong), and GiaoHangTietKiem (Vietnam). With ongoing automation, we are likely to see the gradual adoption of robotics and drones for last mile deliveries in the urban areas of the region.

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