



Impact of COVID-19 on the supply chain industry

Executive summary

This paper seeks to capture the issues, challenges and implications of the COVID-19 pandemic on supply-chain activities globally, regionally and in Nigeria. The publication also provides strategies and insights on mitigating the risks and impact of the supply-chain disruptions brought on by the impact of the pandemic.

Supply-chain resilience is critical to economic recovery in Nigeria. An effective supply chain system ensures higher efficiency rates, quality over control, better customer relationship and service, faster production cycle, reduced production costs and an overall improvement in the financial performance of a company.

The entry of COVID-19 in Nigeria and the subsequent implications and impact has adversely impacted businesses, households and the economy. The slowdown of retail and trade activities, as most finished goods flow through the sector to final consumers, has also affected the manufacturing sector, especially for non-essential goods.

Manufacturers and distributors have found it difficult to replace or replenish their inventory and equipment or machinery, due to supply-chain disruptions globally. Importers and exporters have also found it challenging to deliver or bring in goods across most international borders, as the seaports, which is the main route for international exchange of goods, have been impacted by restrictions and the slowdown of industrial activities of major trading partners.

The International Monetary Fund (IMF) estimated that the Nigerian economy would shrink by 5.4% by the end of 2020, a loss of about N6 trillion to the economy. Based on this prediction, PwC estimates that trade activities in the country could experience a loss of at least N900 billion to COVID-19.

To mitigate the impact on business activities from COVID-19, players in the logistics, transport and supply chain industries must deploy innovative measures in inventory management and distribution, engage in strategic partnerships with players and intermediaries across the value-chain.



pwc

Technological adoption in supply chain processes is critical to maintaining effective supply chains.

Technology has the potential to solve the lack of visibility problem in a supply chain, right from the supply of raw materials (how and where they come from) to the manufacturers and the end-users (consumer). If executed well, better forecasting of inventory levels will be achieved, efficiency of employees, proper accountability, increased warehouse savings, etc.

Companies must also upskill the supply chain workforce or attract digital talent and manage them in cross-functional teams. They must participate in supply chain collaboration with external partners in a wider ecosystem to speed up innovation in the supply chain.



Assessing the impact of COVID-19 on the global supply chain industry

2.1 Overview of the pandemic and how it has caused supply-chain disruption

Global supply-chains have always been vulnerable to shocks that occur in the major exporting countries. Some of these shocks include trade wars, pandemics such as COVID-19, domestic political instability, etc. This vulnerability is especially because of factors that could impede the seamless flow of goods and services from these exporting countries to their major import trading partners.

COVID-19 has disrupted global activities across all economic sectors and industries. The disruptions are largely due to the lockdown measures adopted and implemented by countries globally as a health strategy to mitigate the impact of the pandemic's spread on the human population. Production halts, movement restrictions of people and goods, border closures, logistical constraints, as well as the slowdown of trade and business activities are fall-outs of the COVID-19 lockdown measures.

The COVID-19 pandemic, which began in Wuhan, China, was first reported to the World Health Organisation (WHO) office in China on 31 December, 2019. As of August 17, 2020, there were over 22.1 million reported cases. Its emergence in China, which is one of the major manufacturing and distribution hubs globally, affected the supply of finished and semi-finished products to countries around the world that depend on China for trade.

In the last one and half decade, China has emerged as the world's largest exporter with about US\$2.3 trillion worth of goods exported annually (WEF estimates). China holds 16% of total global exports. Combined, the three largest exporters (China, the United States and Germany) in the world control nearly 30% of total global exports.

China also accounts for nearly 20% of global intermediate products. This has implications for foreign manufacturers that depend directly or indirectly on the country for inputs. For instance, between 2018 and 2019, over 65% of India's total imported Active Pharmaceutical Ingredients (API) were from China. As a result of the pandemic, India has been experiencing delays in the supply, production and distribution of its pharmaceutical products.

Globally, the supply of critical items such as personal protective equipment (PPE) and other medical products and equipment have been constrained due to increasing demand worldwide and export restrictions for these commodities in many countries.

With the implementation of the lockdown, the transportation sector, upon which global supply-chain activities are dependent, has remained partially closed. Statistics show that no less than 90 countries had imposed lockdowns since March 2020 and at the peak in April 2020, about 3.9 billion people were under lockdownⁱ. Consequently, there were constraints to the smooth functioning of the global supply-chains, and this has had an adverse impact on global business and industrial activities.

The shipping industry, which accounts for about 90% of global trade activities estimated at about \$12 trillion, has been impacted by the pandemic. By implication, the World Trade Organization (WTO) estimated that global trade will fall by between 13% to 32%, in terms of volume, by year-end 2020. The supply-chain disruptions have also impacted other sectors including manufacturing, retail, construction, among others.

According to the WTO, nearly all regions will experience double-digit decline in trade volumes in 2020, with the most dips in exports coming from North America and Asia. The electronics and automotive segments will be the hardest hit due to the complexity of their value and supply-chains.

COVID-19 has also exposed the vulnerability of the world's food supply-chains. According to the World Food Programme (WFP), the pandemic could plunge about 265 million people (up from 135 million people) into acute hunger by the end of 2020.

The financial implications of COVID-19 on trade and supply chains are significant. According to the Institute of Shipping Economics and Logistics (ISL), container throughput index, which measures the number of people and goods that pass-through shipping ports daily, declined from 113.3 in January 2020 to 107.7 in May 2020 – a decline of 9.5%ⁱⁱ.

In addition, the International Air Travel Association (IATA) stated that Industry-wide air cargo tonne-kilometres (CTKs) fell by 15.3% year-on-year in the three months to April 2020ⁱⁱⁱ. Explaining further, cargo volumes plunged but lack of capacity boosted loads and yields. This implies that sea and air cargo transport has been adversely affected by COVID-19.

The United Nations Organization (UN) estimated that world trade is forecast to contract by nearly 15% in 2020 amid sharply reduced global demand and disruptions to global supply chains^{iv}.

The World Bank projected a decline of 5.2% in global GDP in 2020 due to COVID-19. What this means is that the amount of global incomes and wealth available to finance production and consumption will reduce by 5.2%. In relation, a fall in global purchasing power means a fall in demand for goods and a reduction in the activities of supply chain companies.

At the micro level, COVID-19 will lead to job losses, reduced incomes and decline in business activities. Subsequently, households could demand less products, thereby affecting the performance of supply chain companies.

2.2. What this means for global supply-chains going forward: key insights

Many countries are looking inward and reconsidering their supply-chain strategies, while multinational companies are restructuring their outsourcing strategies for the supply of essential inputs for domestic operations to mitigate the risks of external disruptions from the lockdown measures.

Governments of developed economies have increased their call to businesses to carefully address processes that will ensure resilience in the face of future disruptions to global supply and industry value-chains.

For instance, the government of France enjoined EU governments to re-think their supply-chains for essential items. The Japanese government allocated US\$2.2 billion to incentivise Japanese firms operating in other Asian countries to relocate to Japan. In the United States, a bill was introduced in the US to take on the ensuing cost implications of companies that choose to shift their production base from China. Also, India is exploring ways to attract manufacturers from China through a reduction in corporate taxes, among other incentives.

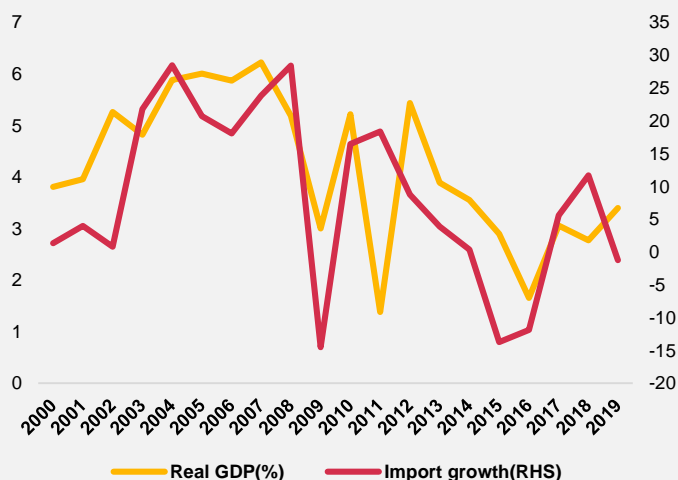
On the other hand, the global impact of COVID-19 has also led to the temporary institution of protectionist policies on certain goods and services to meet domestic consumption as against global demand. For instance, due to possible shortages of essential items such as drugs, protective gears, and ventilators in exporting countries, the World Trade Organization (WTO) allowed some temporary export restrictions.

There have also been noticeable restrictions on the global supply of some food items and industrial inputs in recent times, as countries seek to conserve these goods for their own consumption. Consequently, most emerging markets and developing countries (EMDES) could be impacted by these possible export restrictions, as the importing countries may not have the capacity or capability in the production of such restricted items. Consequently, the industrialisation and economic growth drive of developing countries, especially in Sub-Saharan Africa could be affected, as the region has been severely impacted by disruptions in the value and supply-chain linkages to international markets for commodities, financial flows, technology inputs and human capital.

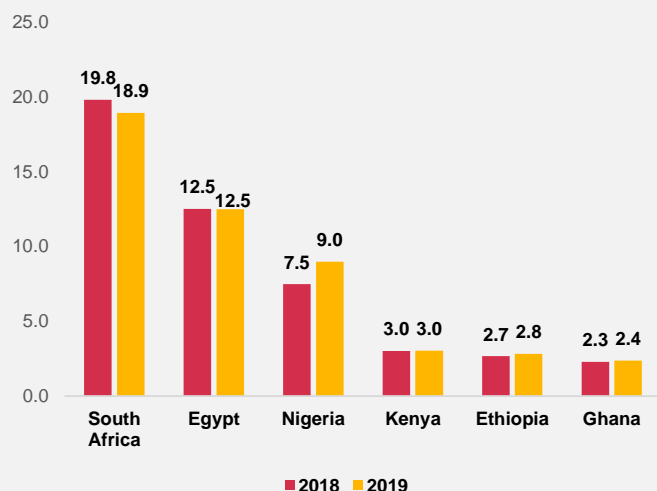
Therefore, as nations appear to resort to high vertical integration and regional or domestic diversification to weather the broad-based disruptive shocks from COVID-19, African countries could lag in the global development curve due to significant dependence on less efficient intra-regional supply chains, which have depressed trade within the region.

Evidently, intra-African trade stood at 16% in 2019, which is considerably low compared to 67% in Europe, 58% in Asia, 48% in North America, and 20% in Latin America. Further analyses revealed that Africa's imports and its real GDP growth are highly correlated, as the three largest economies in the region (South Africa, Nigeria and Egypt) accounted for more than 40% of total imports in 2019. This shows the region's long-term growth and prosperity depends on the seamless inflows of goods, technology and capital from the rest of the world.

Real GDP growth and total import growth
Correlation coefficient: 61.99%



Selected countries by share of total imports in Africa (%)



The severity of the impact of COVID-19 on supply chain activities differ across the following sectors:

Manufacturing	Export and import	Retail trade	Food services	Logistics and transport
<ul style="list-style-type: none"> Manufacturers have found it difficult to distribute their products. There has been inventory buildup, increasing the cost of storage. Producers of perishable finished goods have experienced wastages and output losses. Due to restrictions, the cost of distribution has been high, affecting the profitability of manufacturers 	<ul style="list-style-type: none"> With border restrictions and limitations due to COVID-19, the volume of exports and imports have reduced. Ports have been overwhelmed by imports and exports yet to be cleared due to staff restrictions Warehouses close to the ports have remained mostly at full capacity due to delay in shipping activities 	<ul style="list-style-type: none"> Due to internal and external border restrictions, retailers have found it challenging to sell their products, especially, online retailers Retailers have built up inventories and incurred additional costs of storage There is also the risk that retailers may be forced to sell their inventories at, or below the cost price, thus reducing profits, due to difficulties in sales and distribution. 	<ul style="list-style-type: none"> Distribution cost has become a critical line item on the financial statements of food service providers like restaurants In situations where most companies have deployed work from home strategies, restaurants have had to reduce the volume of products and shift to online delivery strategies 	<ul style="list-style-type: none"> Distribution companies have increased their delivery charges to cover for the drop in the volume of activities There has been some partnerships between traders, manufacturers and logistics/transport companies to facilitate distribution Airlines and shipping companies have had to lay off workforce due to high operating costs and low turnover Increased lobbying by international airlines for government to reopen the airspace and allow them to operate amidst the lockdown

Going forward, there are critical implications of the impact of COVID-19 on global supply-chains and trade. The Organization of Economic Cooperation and Development (OECD) has articulated some actions to mitigate the impact of COVID-19 shown below:

Boost confidence in trade and global markets by improving transparency	Expediting certification procedures for global shipping and air cargo transport	Avoid export restrictions on essential goods, such as medical equipment and, especially, food products	Avoid further escalation in ongoing trade tensions	Improve supply chain visibility to gain deep insight into capacity constraints	Model new risks and costs to adopt proactive measures	Focus on resilience by diversifying source markets for inputs	Firms and governments will need to re-think resilience in global supply chains
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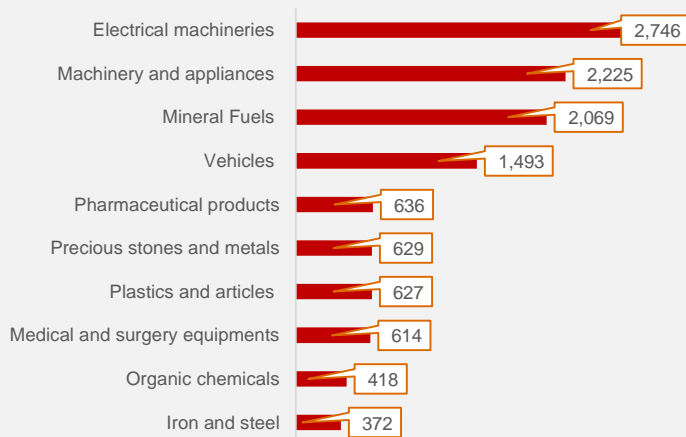
Evaluating the supply-chain systems in Nigeria

3.1 Introduction of supply chain in Nigeria

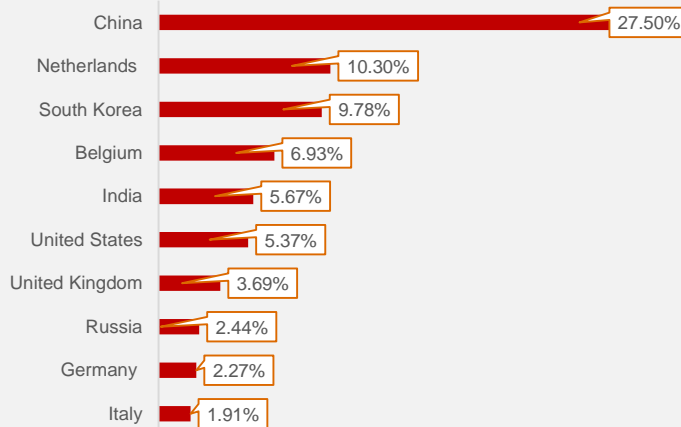


The supply chain process in Nigeria is typical of what obtains in most countries. The process commences with manufacturers obtaining inputs for production. This is largely sourced from countries overseas in the form of imports. The top four import-partners – China, Netherlands, South Korea and Belgium – accounted for over 50% of imports to Nigeria. Nigerian manufacturers utilise the imported and locally sourced inputs to produce semi-finished and finished goods. These are channeled to distributors for onward delivery to retailers or wholesalers for sale to the final consumers.

Top ten manufacturing inputs imported to Nigeria in 2019 (USD billions)



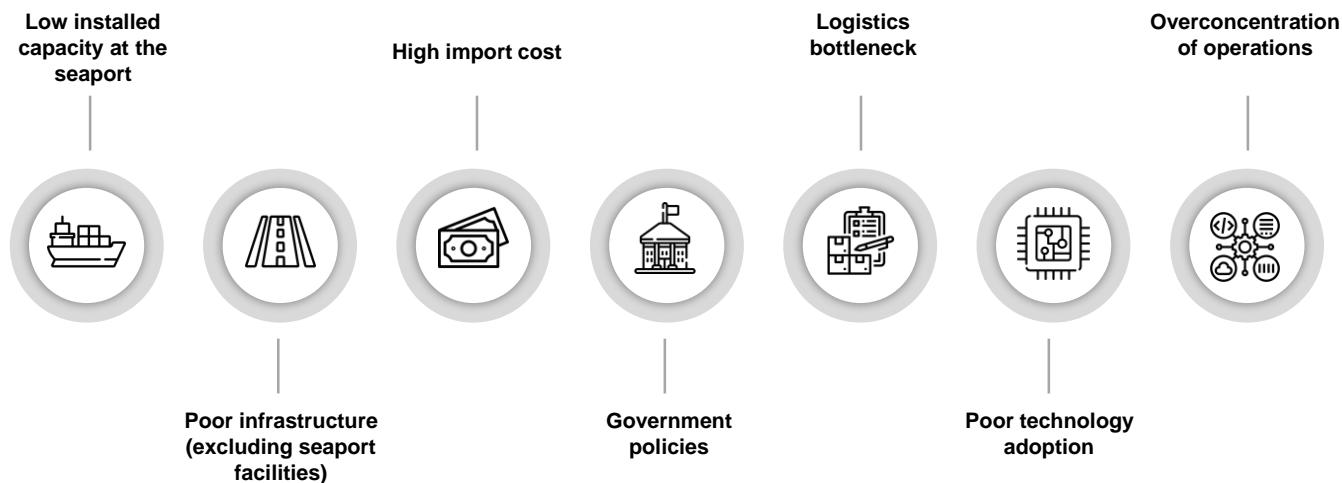
Top ten origin of Nigeria's import in 2019 (%)



3.2 Challenges across the supply chain network prior to the pandemic

Over the years, key players across industries in Nigeria have faced a myriad of supply chain challenges which impact cost, timing and impose risks across all elements of the business.

A combination of consumer expectations, varying routes to market, international complexities and other factors have created significant challenges throughout the supply chain network. Some of these challenges include:



Therefore, organisations need to re-evaluate their strategies and plans to ensure unhindered flow of goods and services.

Low installed capacity at the seaport

Organisations experience delays when purchasing raw materials and products from the international market due to long lead times caused majorly by delayed clearing at the ports. The Apapa seaport, which is the largest in West Africa, is overwhelmed by the influx of imports and exports due to limited capacity within the ports facilities, chronic and chaotic gridlock of cargo traffic and heavy-duty vehicles on the port access roads, overconcentration of trade activities on the Apapa sea ports, low adoption of technology for logistics, clearing, forwarding and other port activities, among others.

Furthermore, compared to advanced ports globally, equipment such as ship-to-shore container crane, container handler and fork-lift truck are not enough. All these, coupled with the lack of diversification of port network infrastructure across the country, account for the delays in the movement of sea cargo. Inability to meet timely demands, default by suppliers in trade agreements and increased costs of logistics and storage are the resulting consequences.

Poor transport infrastructure (excluding seaport facilities)

Apart from the seaport, there is dearth of enabling transport infrastructure to enhance the activities of the supply chain industry in Nigeria. Untarred and damaged roads across distribution networks, faulty distribution trucks and lack of proper storage facilities, particularly for agricultural goods, are some of the challenges impacting the supply-chain sector. In addition, the lack of a coordinated transportation network in the country that includes cargo rail and inland water transport also contributes to the constraints. As these issues persist, they impact delivery and lead times.

High import cost

The instability in exchange rate results in a backlog of unmet foreign exchange (FX) demand by manufacturers who want to import raw materials for production. During the FX crisis, such as in 2016, the depreciation of the exchange rate raised the cost of production for suppliers, resulting in cost-push inflation.

Government policies

Government policies have had a significant impact on the development of the supply chain industry. For instance, in 2019, the Lagos state government imposed a ban on motorbikes, affecting companies like O-Pay and Gokada, that facilitated supply chain activities. On the other hand, policies like the closure of the border and restrictions of FX access for milk and corn importation have encouraged domestic production of raw materials via the supply chain in Nigeria. Therefore, government policies in Nigeria have had both positive and negative effects. In areas of technology adoption and supply chain infrastructure development, as well as improving process flows at the land and sea borders, more government policies are required to further strengthen and develop the supply chain industry

Logistics bottlenecks

Nigeria possesses an inadequate transport network infrastructure across the country. There are also the instances of the shortage of long-haul drivers and trucking capacity due to the problems associated with travelling interstate. As a result, movement of goods within the country is not efficient and is marked by high transport costs, unreliable delivery times and loss of goods.

Poor technology adoption

Supply chain industries globally have embraced disruptive emerging technologies like artificial intelligence, advanced analytics, the internet of things and conversational systems. Most of these technologies have not been fully adopted in the supply chain industry in Nigeria, despite their successes in other climes.

For instance, AI can find supply chain patterns and predict future demand and conversational system can automate supply chain customer service. This Nigerian supply chain industry remains relatively manual-based and static, and lagging behind their peers in other countries.

Over concentration of operations

To take advantage of economies of scale, purchase discounts, and lower costs, most companies have concentrated their operations at a single location. As a result, there is reduced flexibility in organisations' reactions to changes in environmental conditions and other infrastructural challenges that impact their operations.

The Nigerian supply chain industry remains relatively manual-based and static, and lagging behind their peers in other countries.



3.3 Impact of COVID-19 on Supply Chains in Nigeria

In response to the COVID-19 pandemic, the Nigerian Government has implemented a range of measures such as social distancing, movement restrictions (ground and air freight), curfews, partial and complete border closures, among others, to contain the spread of the virus. These measures have impacted the supply chain through staff shortages, restrictions in market/delivery routes and changes in consumer behaviour and buying patterns.



Agriculture and supply chain

- Although the Federal Government exempted food production companies from the restrictions announced in March 2020, some of the measures adopted by various States to contain the spread of COVID-19 led to certain disruptions in the distribution of food across the country
- These measures impacted the logistics and supply chain for food and agricultural inputs/outputs, as well as halted food production and agricultural activities. In addition, there was shortage of labour and farm supplies, as well as the inability of farmers across the country to access raw materials.
- In an interview carried out by Reuters (Lagos), several farmers in Benue State highlighted that although demand was high across the nation, crops were rotting in the fields or at the depots as a result of movement restrictions.
- This could lead to food shortages and entrant of speculative trading activities and thus an increase in the price of available food products. Even though food truck drivers and stores selling essential items such as groceries were meant to be exempt from lockdown restrictions, many were afraid for their own safety, or feared they will be fined or arrested by overzealous security agents.
- The overall effect of COVID-19 pandemic on agriculture include food shortages, rising food prices, artificial scarcity, loss of farmers' income, disruptions in supply chains because of transportation problems and other issues, low sales of specific agriculture products due to the reduced activities of hotels and restaurants
- Measures taken by the federal government to reduce the impact of COVID-19 include a presidential order to supply grains from the grain reserves, supply of improved seedlings of sorghum, pearl millet, cowpea and rice to farmers, lockdown guidelines that exempt farm operations and supply chains.



Manufacturing (food and non-food)

- The impact of COVID-19 is spread across the manufacturing value chain. This includes the availability of FX, sourcing of raw materials, spare parts for the maintenance of plants and machinery, new spare parts and machinery orders, as well as the distribution of finished goods, etc.
- Sourcing of raw materials – manufacturers of food and non-food finished products are finding it difficult to obtain raw materials for their production from overseas, especially as the countries, which supply most of the raw materials have witnessed a slowdown in industrial activities
- Production of finished goods – production has declined with the disruption in the supply chain. Producers had to draw down on their inventories, but the global restrictions hampered the distribution of inputs, intermediates and finished products
- Access to FX – manufacturers in Nigeria have been impacted by the supply challenges of FX to finance their import bills. This is due to the fall in crude oil prices. This is also related to the global supply chain disruptions, as a result of declined industrial activities in countries like China and India, which impaired the supply of Nigeria's crude
- Inflation – The National Bureau of Statistics reported inflation at 13.2% in August 2020 compared to 12.2% in February 2020.
- GDP - the manufacturing sector GDP declined by 9%/y in Q2 2020.
- Plant shutdown – some manufacturing plants in Nigeria have had to shut down their operations due to COVID-19 and supply chain disruptions
- Jobs – some employees have lost their jobs due to the closure or suspension of operations of the companies they work for.



Imports and exports

- The movement restrictions of people and goods resulted in decline in exports and imports.
- **Imports** dropped from **N1.86 trillion** in January 2020, before the emergence of COVID-19 in Nigeria to **N1.13 trillion** in March 2020.
- **Export** also dropped from **N1.69 trillion** in January 2020 to **N966 billion** in March 2020, a decrease of **42%**.
- There was shortage of workforce at air cargo facilities, shipping ports, inland container depots, etc. due to the lockdown, which hindered supply chain movement.
- In Nigeria, vessels entering the country's waters are required to observe a mandatory 14-day quarantine period before clearing or discharging goods and/or taking up fresh cargo.
- This has impacted the shipment of materials and other essential goods at the Lagos Port and also delayed the arrival of goods.



Trade and retail

- Retail outlets experienced frequent stock out and difficulty in stock replenishment. This situation was also influenced by the drop in the industrial activities in the West, which supplies most of the finished products found on the shelves of retail malls and shops.
- Retailers also witnessed a high rate of panic buying from Nigerians, a few days before the lockdown and during the lockdown period. Reacting to this, most supermarkets were compelled to limit the number of essential products that a single customer can buy.
- A couple of retailers switched from providing physical shopping to online shopping services.
- Some retailers entered strategic partnerships with delivery and logistics providers to facilitate the delivery of their products to customers.
- To reduce the effect of COVID-19 on Nigerians, some retailers and traders provided discounts to their customers.

3.4 Financial implications of COVID-19 on supply-chain industry: estimating the risks

Gross Domestic Product loss

Nigeria recorded real growth of 2.3% in 2019; however, the International Monetary Fund (IMF) has projected that the Nigerian economy will **contract by 5.4%** by the end of 2020 due to COVID-19. This represents a minimum **loss of N6 trillion** to the economy in 2020.

Trade and supply chain loss

Allocating the **N6 trillion** loss across sectors based on the 2019 contribution to GDP, PwC estimates that the minimum **GDP loss to trade will equal at least N900 billion** in 2020 due to COVID-19.

4.1 Solutions

Addressing the current disruption in the supply chain industry in Nigeria requires sustainable and emerging solutions. Some of these are proposed below.

Supply-Chain Transparency

Supply chain transparency, an issue many Nigerian companies face, sets the stage and is a key catalyst for greater sustainability and resilience within a supply chain. Supply chain transparency isn't a new concept, but advanced capabilities are making an entirely new level of visibility possible.

Smart Logistics

Every company aims to minimise costs and maximise profits; smart logistics is the key savings driver and a growth lever in the connected supply chain ecosystem. Managing and executing the physical flow of goods from the point of origin to the point of consumption is an essential part of the supply chain. Smart logistics — the next level of this coordination — connects the physical shipment and information flow between suppliers, manufacturers, distributors and customers interactively and in near-real-time, building on supply chain transparency.

AI-Driven Supply Chain Management

Artificial intelligence is accelerating supply chain improvements and will become the new norm as companies work towards improving supply-chain management. AI can be an enormously powerful accelerator of key supply chain capabilities, with the potential to drive efficient decision-making and build systems that can autonomously adapt to changing conditions. By applying sophisticated AI methods, such as machine learning and natural language processing, to supply chain capabilities, companies can increase transparency, improve planning and enhance logistics flows.

4.2 Insights and strategies for business leaders

Technology

Technology has the potential to solve the lack of visibility problem in a supply chain, right from the supply of raw materials (how and where they come from) to the manufacturers and the end-users (consumer). If executed well, better forecasting of inventory levels will be achieved, efficiency of employees, proper accountability, increased warehouse savings, etc.

Logistics execution has seen a whole range of technological innovations coming into play to improve processes and activities. Examples include automated picking, drones and autonomous guided robots/vehicles in warehousing, or track and trace in transportation, etc.



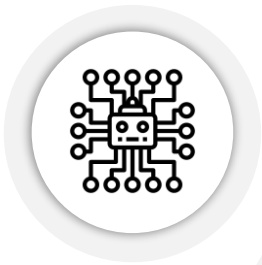
Blockchain

- The distributed ledger characteristics of immutability and traceability that comes with blockchain technology provides transparency and builds trust in the supply chain network
- It also solves the problem of counterfeit goods for both consumers and manufacturers who can trace the products right from tier one to the last tier in the chain.
- In addition, blockchain based smart contracts can enhance faster payments once the agreed terms are met.



Internet of Things (IoT)

- **Asset Tracking:** RFID and GPS sensors are IoT enabled devices which can track products “from floor to store”.
- **Forecasting and Inventory:** IoT sensors provide accurate inventories beyond human capabilities. Companies can manage stock levels more precisely, as information on the arrival of raw materials or components to production lines, or of finished goods in warehouses, are updated real time.
- **Scheduled Maintenance:** IoT enabled smart sensors can be used to manage planned and predictive maintenance for manufacturing leading to reduced downtime and cost savings.



Robotic Process Automation (RPA)

- The implementation of RPA involves automating tasks and integrating business processes across technologies and business functions.
- Manual process distribution in Nigeria currently slows down distribution within the country’s supply-chain. Within a supply-chain, autonomous robots can decrease long-term costs; provide labour and utilisation stability; increase worker productivity; reduce error rate; reduce frequency of inventory checks; optimise picking, sorting, and storing times; and increase access to difficult or dangerous locations
- Autonomous robots will soon become a norm in the supply chain of the future as advancements make them operate with more human-like abilities.

Data and analytics

Data & Analytics are pivotal to achieving supply chain resilience. Supply chain ecosystems are generating vast quantities of data. Companies are beginning to use data networks that capture the full range of data and relationships being generated across their entire supply chain from a diverse range of sources — all the way from raw materials to customers and back.

When companies can effectively take advantage of these diverse data streams and share data with their supply chain partners, they can reap significant benefits. In order to achieve this, they need to integrate the data into a semantic supply chain data network.

Having access to the right data is the first step to achieving supply chain resilience. While many companies are already making use of a wide variety of data to support their supply chain decisions (e.g. operations data around components and materials or manufacturing and quality data, such as equipment monitoring).

The potential value of data can be further enhanced when companies apply AI methods such as machine learning or deep learning. AI can significantly enhance all of the key capabilities discussed here: integrated planning, transparency, and smart logistics.

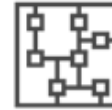
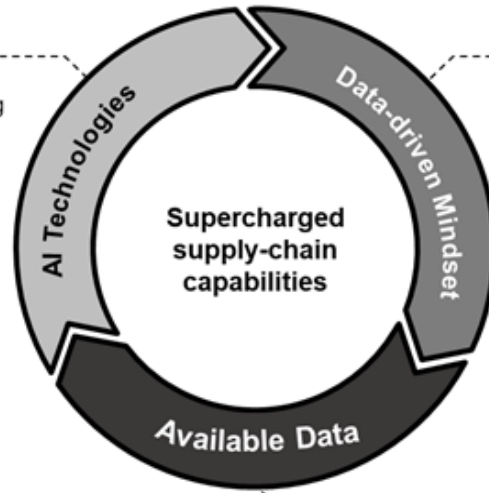




Use an **AI platform** to supercharge supply chain capabilities by developing and implementing AI use cases that leverage various methodologies (e.g., machine learning, deep learning, regression analysis)



Establish a **responsible and data-driven mindset** by upskilling the supply-chain workforce towards citizen data scientists, and democratize access to data, both internally across functions and externally towards supply chain partners



Leverage all relevant data along the **entire supply chain** – internal data across the company, data for supply chain partners and customers, and publicly available data

Structural and policy recommendation

1

Integrated Supply-Chain Ecosystem

All relevant internal functions should be connected using one common data network, from Research and Development (R&D) and procurement through manufacturing, logistics, and marketing and sales.

2

Technological Maturity

Leaders should adopt digital technologies to establish a two-way, near-real-time connectivity across the entire supply chain, as technological maturity addresses key supply-chain challenges.

3

People-Focus

Companies must upskill the supply chain workforce or attract digital talent and manage them in cross-functional teams. They must participate in supply chain collaboration with external partners in a wider ecosystem to speed up innovation in the supply chain.



4.3 Case study of a corporate implementing supply-chain innovation in processes

Lessons from Kobo360

Kobo360 is a Nigerian logistics company with a tech enabled platform that connects cargo owners to trucks and trusted truck drivers. With the use of AI and machine learning, customers (cargo owners) have full visibility of their cargo, truck owners save time trying to get access to big companies, and are guaranteed their trucks will not be redundant, as drivers have regular work trips.

With AI, the algorithms select the best truck drivers for sensitive cargo or high priority cargo, based on their profiles. For example, the length of time they have been on the app, number of trips taken, number of incidents involved in, among others. Data collected from the trips, like amount of fuel used, the distance, the states travelled, the region and number of roadblocks faced, determine the pricing for the trips. High demand and low seasons also contribute to the pricing for trips, and in recent events, the COVID 19 crisis has also contributed.

Despite the technology making one side of the equation easier, insecurity in some regions, corruption and bad roads are some of the key challenges the company faces. With big data and technology, Kobo360 can optimise processes, predict future opportunities and challenges hence creating profitability and efficiency for all parties involved.

4.4 Case study of a country implementing supply-chain innovations in trade

Lessons from Japan

Japan has long acted as a gateway between the consumers of the west and Southeast Asia's low-cost labour and manufacturing bases, and their Economic Partnership Agreement with the EU, which entered into force in February 2019, has allowed them to capitalise on their links.

Third-party logistics are becoming a norm in the East Asian country, as companies have found that outsourcing their logistics networks to third parties has helped cut costs and improve efficiency. The global e-commerce industry, which has seen recent growth, is another key driver in Japan's growing supply chain resilience. The growth of the e-commerce industry has in turn driven demand in the logistics space, leading to large investments in state-of-the-art logistics facilities in the country, allowing operators to enhance speed and efficiency in the shipments of consumer goods through the use of digital technology.

Companies have begun developing technologies for Japan's logistics industry, with NTT developing a blockchain platform for supply chain and logistics management, as well as IoT innovations such as GPS sensors and radio-frequency identification (RFID). Other technologies such as Drones are also gaining traction in the country's logistics industry.



Conclusion

As the impact of COVID-19 spirals across the Nigerian economy, the supply chain industry is impacted by the associated challenges. Manufacturers of finished goods that are usually distributed across the value chain are unable to source for raw materials from international suppliers. COVID-19 also resulted in a local lockdown that impacted wholesale, retail, and distribution operations. Consequently, COVID-19 has impacted the supply chain sector, and as a result, led to increased inflation and reduced volume of goods distributed across the value chain.

Reacting to the effect of COVID-19 on the supply chain industry, participants across the value-chain have adopted efficient measures geared at sustaining production and delivery to final consumers. Some of the innovative measures include the use of technology to take up orders from customers, strategic partnerships between producers, intermediaries and delivery companies, innovative management of inventory to avoid stock-out, etc. Most of these measures have proved to be effective and should be maintained going forward.

With a huge loss impact by COVID-19 on the supply chain - a minimum of ₦6 trillion loss in Nigeria's GDP, ₦900 billion losses in trade sector GDP and inflation rising to 12.9% by December 2020, critical recommendations are necessary to mitigate these effects. First, the supply chain must be integrated to ensure a seamless transfer of goods from producers to consumers. Also, technological adoption in supply chain processes is indispensable to the survival of the supply chain industry. Lastly, upskilling of supply chain participants is critical at a time like this. For technological adoption to aid risk absorption in the supply chain industry, the people involved must be upskilled and equipped technology-wise.

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