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Abstract

The coronavirus emerged in China in December 2019 and spread globally during the first quarter of 2020. As isolation and shut-down policies were rolled out, stopping or limiting work activities and people's mobility, supply chains, and trade were slowed down or brought to a halt. Managing the pandemic has generated a unique blow to the world economy, simultaneously affecting supply, demand and trade. Supply has been affected directly through the suspension of operation of economic units across multiple activities. This has led to redundancies and suspensions, which have directly affected demand through dampening income expectations. The lockdowns have directly affected many services, such as hospitality and retail services, with a knock-on effect on their domestic and foreign suppliers. In addition, restrictions applied on the movement of people and goods represent a huge hit to activities such as tourism and transportation. In the latter case, this has serious ramifications for many other activities that rely on the use of these services. Moreover, the actions that third countries have adopted to increase the domestic supply of critical products have affected Africa's ability to address the pandemic and the economic crisis. The recovery of African supply chain is going to be significantly linked to how fast European production and trade recover. A recovery of the Chinese economy, which in part will be conditional on the global recovery, will have smaller direct effects in terms of assisting with the recovery of African trade. In addition to their forward linkages, African economies are significantly integrated into supply chains as buyers. In some cases, African companies import intermediate goods to be further processed on the continent to be transformed into final goods. In other cases, imports of final products are commercialized through African retailers and wholesalers. In order to recover and build resilience in the medium to long term, African economies should maintain momentum and ambition on the landmark African Continental Free Trade Area (AfCFTA) Agreement. A rapid and ambitious implementation of the AfCFTA will help the recovery from Covid-19 impacts, while reducing Africa's exposure to future adverse

effects of global shocks related to health, food supply and climate change, and more regional shocks such as the locust crisis in East Africa. The pandemic has highlighted that a robust supplier management system that takes into account sub-tier dependencies and proximity is a prerequisite for today's supply chain, and in turn has underlined the need to use the AfCFTA as a springboard for developing Africa's industrial base.

Keywords: *Supply Chain Management, procurement practices, Covid-19.*

1.1 Introduction

The coronavirus emerged in China in December 2019 and spread globally during the first quarter of 2020 (WHO, 2020). The transmission control policies implemented by governments' almost simultaneously triggered severe economic disruption, as had been the case with other similar diseases. As isolation and shut-down policies were rolled out, stopping or limiting work activities and people's mobility, supply chains, and trade were slowed down or brought to a halt.

Managing the pandemic has generated a unique blow to the world economy, simultaneously affecting supply, demand and trade. Supply has been affected directly through the suspension of operation of economic units across multiple activities. This has led to redundancies and suspensions, which have directly affected demand through dampening income expectations. The lockdowns have directly affected many services, such as hospitality and retail services, with a knock-on effect on their domestic and foreign suppliers (Africa Business, 2020).

In addition, restrictions applied on the movement of people and goods represent a huge hit to activities such as tourism and transportation. In the latter case, this has serious ramifications for many other activities that rely on the use of these services. Moreover, the actions (e.g. export restrictions) that third countries have adopted to increase the domestic supply of critical products (e.g. pharmaceuticals) have affected Africa's ability to address the pandemic and the economic crisis (COMESA, 2020).

Lockdown and other social distancing measures applied by China early in the year resulted in shutting down of manufacturing lines and supply chain disruptions with ripple effects across global economies. The china effects coupled with growing number of African countries applying lockdowns measures, closing borders is not just disrupting the supply chain (affecting trade and industries) but also a massively depressing demand (EAGC, 2020).

The crisis has had strong effects on Africa. The fall in commodity prices constitutes a significant blow to the trade and macroeconomic situation of many African countries that rely on few agricultural and mineral commodities. Meanwhile, the anticipated massive fall in income from tourism is going to hit many other countries that rely on tourism. Trade is also being affected, as Covid-19 is increasing international trade costs through additional inspections, reduced hours of operation, road and border closures and increased transport costs. Moreover, the fall of income in Africa and in other regions is affecting the exports of manufactures. Another dimension of the impact is associated with the participation of Africa in supply chains. Africa is primarily involved upstream, providing intermediate products and services to a wide range of global supply chains. African exports, including their value added, are therefore being affected simultaneously by the impact on direct exports but also by the impact on exports between third countries.

The economic crisis generated by the Covid-19 pandemic is likely to be the deepest since records began. The International Monetary Fund projects a fall in global gross domestic product of 3% and the World Trade Organization (WTO) a drop in trade of between 13% and 32%. In Africa,

trade volumes are projected to decrease by 8% for exports and about 16% for imports for 2020, compared with previous historic trend estimates (WTO, 2020).

Europe (the EU and the UK) appears to be particularly important in the integration of African firms into global supply chains. More than 60% of African value added in global exports is embedded in European production. This value added embedded in part directly in exports to Europe but also indirectly in the exports of third countries to Europe. Consequently, the pandemic's impact on African trade is closely linked to the performance of Europe's economy. The close integration of African firms within Europe-led supply chains suggests that the recovery of African trade is going to be significantly linked to how fast European production and trade recover. A recovery of the Chinese economy, which in part will be conditional on the global recovery, will have smaller direct effects in terms of assisting with the recovery of African trade (UNCTAD, 2020).

In addition to their forward linkages, African economies are significantly integrated into supply chains as buyers. In some cases, African companies import intermediate goods to be further processed on the continent to be transformed into final goods. In other cases, imports of final products are commercialized through African retailers and wholesalers (Fairtrade, 2020).

Even though Africa is the region currently less affected by the pandemic, currently only having an estimated three per cent of the currently reported caseload, this situation may change. Africa has been heavily affected by the consequences of airline restrictions, especially inter-regional logistics travel inside Africa, in addition to the social and economic consequences as a result of mitigation measures. Routes to the African continent have been particularly badly hit, although there are signs that some airlines are beginning to resume partial services, such as Air France and KLM, Ethiopian, Turkish, and Brussels Airlines are also operating cargo services to many destinations in Africa, and the resumption of limited passenger flights, government restrictions allowing (IMF, 2020).

1.2 Study Objective

The key objective of the paper is to evaluate the dynamics of supply chain management in the Times of Covid-19.

1.3 Specific Objectives

The specific objectives are;

1. To examine how countries in Africa have managed their supply chain practices during COVID-19.
2. To determine the procurement challenges encountered by African Countries during COVID-19 period.
3. To draw lessons learnt by African Countries during COVID-19 period.

1.4 Supply Chain and its Challenges in Africa amid the COVID-19 Pandemic

As the world grapples with the human and economic crisis unravelling before us, supply chains are finding themselves squarely within the public eye and experiencing unique challenges of their own. For weeks at the start of the year, as COVID-19 was taking its toll on China, experts were focusing on 'supply shocks'. These were disruptions to the availability of goods sourced from China; both finished goods for sale and products used in factories in developed markets. Companies scrambled to sort out what production was feasible, and what demand could be met. As the pandemic crisis deepened and nations begun instituting lockdowns, supply chains have

been experiencing something completely new: systemic demand shocks, where people were stocking up on consumer staples in order to comply with restrictions on movements, in some cases buying months' worth of goods in a single day (Banga, 2020).

The pharmaceutical sector presents an interesting case, given the importance that its products have acquired during the pandemic's management. Africa is being affected by export restrictions in countries of origin and lower access to medicine supplies as a result of shutdowns of manufacturing facilities in China and India. Covid-19 has magnified Africa's reliance on imported pharmaceuticals (both final and intermediate products) and amplified the urgency to build competitive, resilient and robust value chains in this sector (Kurian & Kapoor, 2020).

Simultaneously, the Covid-19 crisis is affecting African countries through its participation in several value chains. In Kenya, the tea and cut flower value chains have been severely hit. In both cases, disruptions to the main trading markets have affected prices and volumes traded. In other cases, restrictions applied to passenger flights across the world have reduced the availability of transport for products such as cut flowers and fresh agricultural products. The tourism sector is also being severely affected, given the travel restrictions imposed in origin and destination countries. Ethiopia's coffee and cut flower supply chains are being affected. Moreover, the importance of travel and transportation services in the Ethiopian economy (Addis Ababa is the most important travel hub in Africa) suggests that the global fall in travel will affect exports of these services as well as limiting their supply to other industries on the continent (Otieno, 2020).

With the closures of shopping malls and high streets, many companies realized they have to change the moves from multi-channel to omni-channel distributions to a completely digital and online trading environment by adopting digital technologies and cooperating with in logistics service providers to offer home deliveries. Even automotive companies are embracing more online shopping activities to deal with historically low foot traffic and extensive closure of many showrooms completely by trying to meet car buyer needs virtually. In addition, one company resolved a shortage of parts for life-saving ventilators in Italy by using 3D printing and making them available within a day (though they are being sued for their efforts). This trigger the creation of a role for additive manufacturing in the spare parts supply chain (World Economic Forum, 2020).

Changes in business models and the use of innovative practices and technologies also lead to changes in existing supply chain structures and relationships. In addition to the 'digitalization' of relationships, the value of relational competence is challenged by emerging threats caused by financial crisis facing many suppliers and buyers. While evidence show slowing down in economy can lead to a significant decrease in pollution, it is unsure how emerging financial crisis and deep recession could disrupt the ongoing efforts in achieving triple bottom lines through green supply chain management.

African commercial centers are often far apart, increasing cost and making economies of scale difficult to achieve. For example, many low cost distribution models piloted in Asia (e.g. India) and Latin America (e.g. Mexico) will likely fail, as distances are greater and the numbers of commercial clusters are not comparable with these continents.

In distributors during the Covid-19 finding the right distributors to reach the vast numbers of traditional outlets is difficult (if not impossible) and it requires enormous development and training. As with many emerging markets, the outlet base keeps evolving as outlets open and close. Keeping the outlet list up to date can be a difficult undertaking.

The lack of an organized Third party logistics (3PLs) and skills gaps – In many countries organised 3PLs revolve around independent transporters with limited number of vehicles. Many 3PLs might also lack the required skills and professionalism. Normally, ongoing training and support are required. Due to poor remuneration, staff turnover is high, and this will also have a negative impact on cost.

Many warehouses for rent are also poorly designed, with poor yard management, ventilation and equipment. Finding a professional warehouse operator can be a daunting experience.

During the Covid-19, many organizations, counterfeit and parallel imports remain a major concern. African markets remain a dumping ground for many importers and exporters that buy expired (or close to expired products) from European retailers. Large trading groups, operating out of the Middle East (e.g. Dubai), are normally a great source for importers. Pharmaceutical companies are also fighting an uphill battle against counterfeit products on the continent.

1.5 Key Lessons on Supply Chain during COVID-19 Period from an African Perspective

In the wake of countries' struggles to procure essential medical products from global suppliers to fight Covid-19, there has already been a positive shift from global towards more regionalized and local supply chains. For example, in South Africa, U-Mask has redirected its production from protective masks for mining and agricultural companies to medical respirator masks. The National Agency for Science and Engineering Infrastructure produced the first made-in-Nigeria ventilators. Senegal, in collaboration with the UK and France, is prototyping a pocket-sized testing kit that will cost less than \$1, and in Ghana a diagnostic firm in cooperation with a local university developed a test that delivers results in 20 minutes (Primi *et al.*, 2020). This demonstrates that there is potential for Africa's industries to respond to demand, whether public or private.

A recent survey jointly carried out by the Africa Trade Policy Centre (ATPC) of UNECA and International Economics Consulting Ltd. (IEC), on the impact of Covid-19 on business and trade across Africa, substantiates the ability of African firms to adapt and innovate in response to Covid-19 challenges, including global supply chain disruptions.

In order to recover and build resilience in the medium to long term, African economies should maintain momentum and ambition on the landmark African Continental Free Trade Area (AfCFTA) Agreement. A rapid and ambitious implementation of the AfCFTA will help the recovery from Covid-19 impacts, while reducing Africa's exposure to future adverse effects of global shocks related to health, food supply and climate change, and more regional shocks such as the locust crisis in East Africa. The pandemic has highlighted that a robust supplier management system that takes into account sub-tier dependencies and proximity is a prerequisite for today's supply chain, and in turn has underlined the need to use the AfCFTA as a springboard for developing Africa's industrial base (African Trade Policy Centre, 2020).

The delay to the start of trading offers a window of opportunity for creative thinking on how to reconfigure the AfCFTA to reflect the new realities and risks of the twenty-first century. The health sector needs to be elevated as the heart of the AfCFTA Agreement and prioritized in the initial stages of implementation. Pharmaceutical and medical products should not be included on the sensitive item or exclusion lists of state parties' tariff schedules and should be prioritized in the finalization of rules of origin and harmonization of standards. Member states should also consider adding health and education services to the priority list of services sectors for the first round of services negotiations, and revisiting the AfCFTA built-in agenda to introduce a new ambitious

work programme of simultaneous negotiations on Phase 2 issues (intellectual property rights, investment and competition policy) and Phase 3 issues (e-commerce) in 2021–2022 (African Trade Policy Centre, 2020).

1.6 Impact of Supply chains Interruption in Africa

The direct effects of lockdown policies on African exports are significant enough to raise serious concerns about the short-term economic cycle on the continent as well as about long-run economic growth. The commodity price and services shock could take away a significant share of economic growth and put many African economies into recession. Moreover, lower economic growth is likely to reduce all investment dimensions, which will bring down productivity and in turn curtail future economic growth.

Indeed, Africa is a major global exporter of commodities such as oil, gold, cocoa, coffee, iron ores and copper, among others. Increasingly, the continent is also an important supplier of a wide range of services in the travel and transportation sectors. Exports of certain manufactures and other products (e.g. cut flowers) that benefit from preferences in developed countries are also being affected by the closure of retailers and the lockdowns applied in export countries (McVey & te Velde, 2020; te Velde, 2020).

Intra-continental supply chain is being affected in the same way as extra-continental exports. The combination of lockdowns and lower income is reducing demand for products and services traded within the continent. While the share of intra-African trade remains relatively low, the fall has significant implications, given that it affects, in particular, trade in manufactures and processed products. Much of intra-African trade between neighboring countries takes place informally, and recent Covid-19 border closures mean that this trade has largely come to a complete halt. This has fed into price hikes in key agricultural staples in some of Africa's largest cities such as Nairobi and Accra (Luke *et al.*, 2020).

The fall in intra-African supply chain, with strong effects on cross-border transactions, has been particularly affected by additional controls and restrictions placed at borders to stop the spread of the disease. This has generated serious delays at border, which have been compounded by the lack of personal protective equipment (PPE) for customs and other agencies' staff as well as quarantines imposed on truck drivers when crossing the border.

1.7 Discussion on Way forward

How Businesses Are Transforming the Modern Supply Chain We saw how COVID-19 brought about many uncertainties and risk to businesses whose success of their supply chains is reliant on external factors. This pandemic has highlighted to companies the urgent need to transform their supply chain models to withstand any disruptions in the future. Some companies have already begun building more resilient supply chains while others are forced to as a result of this pandemic.

Many companies are forced to look for alternatives when China, the world's factory, shuts down its plants and factories during COVID-19. This is not doubted as the supply chains of many companies are reliant on China's ecosystem. Businesses have learnt the hard way of heavily relying on China's economy through this pandemic. In response, CEOs of many companies requested for their supply chain teams to find other sources wholly independent of China. There was also increasing pressure from investors and government bodies who discouraged over-reliance on any one source and called for decoupling from China.

Companies should conduct a comprehensive mapping of their supply chain in order to predict and prepare for disruptions from the supply side. The mapping should comprise not only the pinpointing of the company's immediate suppliers, but also indicating geographical locations of manufacturers' plants and factories. This is to specify and classify the products' risks by location and in a timely manner. Companies should be aware of their entire supply chain network and interplay between their supply chain players to effectively plan for and mitigate risks in the event of such a disruption like COVID-19.

Diversification of supply chains and new configurations of manufacturing, distribution and warehouse networks might require changes in network flows and transportation modes. Although these changes might take time to be conceived and put into operation, it is worth noting that even at the time of writing, new modes of transportation are arriving, such as expedited ocean freight. The same holds true for rail freight services, for example from China to Europe and vice versa. Featuring point-to-point routings, fast steaming, and 'white glove' dedicated expedited handling at through ports, the appeal is obvious. As the new normal slowly emerges, it is likely that more such offerings will be leveraged.

In parallel to all this, transportation related and workplace-related changes connected with social distancing and disease prevention can be expected, at least until an effective vaccine emerges. As supply chain professionals know all too well, logistics is also a people business, in which employees work in shipping offices, warehouses, crossdocks, ports, and airports. In certain industries, warehouses and picking faces are densely populated – think of online retail. Longer term, this can be expected to accelerate the trend towards working from home in the case of office-based workers (which may in turn accelerate the pace of digitalisation initiatives), and towards robotics and automation in the case of physical goods handling.

It is worth making the point that different working practices, including increased working from home, will not necessarily be damaging to productivity, something that perhaps runs counter to many businesses' expectations. Hard evidence of this has yet to formally emerge, but a number of businesses have already offered early anecdotal evidence that streamlined processes and efficiencies have resulted from their lockdown-induced new working practices. Differences in both corporate culture and national culture, however, are likely to lead to differences in the ability of organisations to benefit from this. Accordingly, supply chain leaders may wish to develop appropriate skill sets in order to successfully implement and operate these new working practices.

If the new normal is the end point, then the pre-new normal is the transition scenario. As with moves to enhance resilience, the transition may not necessarily happen at speed: major shifts in transport modes or routings are not undertaken lightly, or without detailed investigation, and the resulting timescales will reflect this. It is also true that when transportation decisions are predicated upon decisions to, say, switch manufacturing and warehousing locations, or source from elsewhere, then those decisions must first be taken and executed. From a workplace perspective, configuring post-coronavirus workplaces to meet social distancing and sanitizing guidelines is also likely to take some time, with early measures being taken on an emergency basis, and fuller measures being contingent upon capital expenditure, building alterations, professional advice and design, and employee consultation.

Likewise, many warehouses and warehouse processes will need to be reconfigured to reflect the requirements of a socially distancing workforce, with changes such as one-way systems,

distributed picking faces, socially distanced packing areas, and hand sanitiser stations. This can be supported by technology such as IOT, further automation, and robotics.

The requirement for greater social distancing within warehouses and supply chain operations can only accelerate investment in automation and robotics, driving greater digitalisation. IoT devices, sensors, wearable devices, AGVs, drones, and ‘swarms’ of autonomous shuttles: the emphasis now isn’t on efficiency so much as reducing the population density of the workplace, and improving human machine collaboration.”

The recovery process would require a reassessment of the structure of a supply chain in terms of location, production capacity and management of the flow of materials and information amongst the current members of the supply chain in order to identify pros and cons and eventually to reconfigure the supply chain structure (Govindan *et al.*, 2020). Provision of resources would be necessary to implement actionable contingency plans. Unquestionably, integration and collaboration between key members of a supply chain would be crucial in order to establish a common target and to share both losses and future gains to restore the foundations of the businesses.

Knowledge management is an important ability to develop in order to overcome disruption. Gathering data by means of both formal group discussion and brainstorming with key members of a supply chain to identify errors, bottlenecks, opportunities to innovate and solutions that work is critical to managing continuity. Such a data gathering process may benefit from the use of action review and retrospective review tools (Leask *et al.*, 2008), as well as project management documentation templates (Terzieva, 2014).

Other strategies are also important to the knowledge management process, such as education and formal training regarding the weaknesses identified during the group discussion and brainstorming sessions and the use of project management software for sharing information both within a company and across the supply chain (Terzieva, 2014).

After dealing with disruptions in supply chain, it is fundamental to ensure that the three Ts for successful management of supply chains have been used. The 3Ts are time, transparency and trust. Time means focussing only on adding value processes that costumers are willing to pay for; transparency relates to the necessary levels of inventory and costs of production which are reliable and fair for the joint planning of production and sales; and trust is the consequence of collaborative working practices that enable the sharing of gains and losses (Wilding, 2003).

Some supply chains should be given the spotlight as they are critical for society and require specific attention from government, for example, pharmaceutical supply chains, in particular those dependent on biodiversity, grocery retailers, logistics and transportation, and the healthcare and safety sectors.

Society may reassess its decision-making processes regarding consumption patterns due to isolation and changes in habits (resulting from the increased use of social media and chat apps used to share items). According to EY Future Consumer Index, consumers behaviours tend to change after COVID-19 crisis. A survey conducted by Ernst and Young shows that 34% of respondents would be willing for paying more for local products, 25% for trusted brands and 23% for ethical products (Ernst and Young, 2020). Thus, a more sustainable consumption model may arise (Sarkis *et al.*, 2020), moving towards a sharing economy logic, with implications for supply chains which deal with consumer goods. The use of services provided by apps would be reinforced.

The notion of crowdsourcing has been highlighted; therefore, last mile logistics should be developed further to meet the potential rise in demand. The discussion of offshore production should be on the agenda of supply chain managers with regard to the length and location of supply chains. Re-shoring is likely to be a hot topic for governments, policymakers and supply chains managers around the world.

Logistics decisions involving modes of transport, warehousing, handling of materials and packaging should be reassessed in order to seek even more efficient and agile solutions (Choi, 2020). Digital (e.g. use of sensors, cyber-physical systems) and virtual (e.g. virtual reality glasses) technologies would be vital to meeting the new requirements. Procurement activity and in particular the importance of ensuring Right Quality should not be lost in the race to provide goods and services in the Right Time at the Right Place. Technical specifications and due diligence measures still remain vital elements in the procurement process, ensuring that potential suppliers have the necessary qualities to become a partner of government in its role as buyer.

Each sector faces a particular challenge. For example, the hospitality sector should invest more in delivering life experiences, online services and connectivity to customers after the isolation that people have faced, in order to provide high-value services. The hospitality sector may shift the provision of services towards the virtualization business model.

E-commerce may grow even further due to an increase in the number of users; thus, investing in efficient logistics, order fulfilment management and customer service management may be a trend. More information systems and technologies, as well as automation systems, may be required by the manufacturing and service sectors, thus, there may be an increase in demand for such systems, as suggested by Govindan *et al.* (2020).

The world is likely to see a more imbricated relation between geopolitics and supply chain decision-making processes. For example, governments are likely to invest and regulate “key supply chains”, such as pharmaceutical, personnel protective equipment and agri-food chains in order to ensure national food security. This goes against long-term trends of governments' policies of light touch, and simply putting their trust in key corporate supply chains to “do the right thing”; and therefore, relying on big retailers' and suppliers' strong customer orientation to keep supply chains moving. We may be entering a new age of localised/ regionalised supply chains and government intervention once again to determine.

The role of intermediaries might also be reassessed as it is through them that the smallest producers (micro- and small farmers) may coordinate their actions to produce deeper impact in the provision, and end-consumers can shorten the supply chain by actively involved in production/distribution systems (online delivery and/or community-supported agriculture).

Society, businesses and governments will all be transformed in the aftermath of the coronavirus outbreak, and we hope, towards a more sustainable society (Sarkis *et al.*, 2020). Thus, scholars and managers should attempt to consider this transformation through a positive lens in order to improve supply chains and logistics management in order to provide high value and even more outstanding services to society, since it has now been made abundantly clear that supply chains are the veins of an economy.

Develop Africa-wide procurement platforms and end-to-end supply chains. Pan-African coordination will allow governments to leverage their scale in bulk purchasing and secure supply of critical equipment and medical resources.

Facilitate local manufacturing of critical medical supplies. African pharmaceutical and manufacturing companies are stepping up and innovating to produce critical supplies and drugs in the midst of global shortages, disrupted supply chains, and export bans. African leaders can decide which production capabilities are essential for the continent's health security going forward and provide those industries with the support needed to survive and develop. In the longer run, African manufacturing can take advantage of opportunities in intra-African trade and global supply-chain realignments spurred by the crisis.

The unprecedented global and simultaneous shock to supply and demand triggered by the coronavirus crisis is deeply affecting African economies. Trade volumes for goods and services, prices and, hence, value added in trade are all being affected

Recovering and learning are capabilities that should be prioritized by companies that are under pressure due to COVID-19. Recovering refers to the ability to restore activities to the point they were before the disruption, while learning means the ability to improve activities based on the results of a disruption.

In addition to developing more regional value chains, African countries need to protect the position they have achieved in existing global value chains. The implementation of the AfCFTA is instrumental to this goal but insufficient. While investment has been substantially affected, African countries must assure that it is oriented to the sectors with the highest impacts in terms of competitiveness and productivity. This could be essential to respond to the requirements of global value chains to enhance global resilience and robustness. Moreover, the continuation and intensification of efforts to facilitate trade must be accompanied by new actions aimed at guaranteeing the safety of products and people operating in firms and at borders. It is necessary to ensure that the resulting safety requirements do not become new trade barriers.

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