

CHAPTER 4

Optimizing supply chain opportunities in Africa through enablers and incentives

It is evident from the analysis in chapters 2 and 3 of this report that African countries offer untapped potential for global supply chain diversification. For instance, the geographic proximity to source inputs, such as mines, and the associated reduced cost of transport and shipping, can be a major motivation for manufacturers of mineral-intensive products to relocate some of their supply chains to Africa and invest in refineries or other entry- to mid-level tier 2 or 3 suppliers (see chapter 2). However, to unlock such potential and become an attractive destination for the diversification of global supply chains, African countries should create enablers and leverage incentives that could be a catalyst for the relocation of some of the supply chains to the continent and increase investment in efficient and cost-effective continental supply chains.

For instance, investment in improved local manufacturing capacity; enhanced labour force skills; adequate infrastructure, including for distribution and logistics; and reduced trade barriers³⁰ could trigger competitive advantages and make Africa attractive to global manufacturers and suppliers. UNCTAD (2021b) found that through tariff liberalization and the removal of non-tariff barriers, the African Continental Free Trade Area is expected to increase trade and attract investment to build productive capacities, therefore expanding supply in Africa to serve rising regional demand. Such regional opportunities could foster the competitive position of Africa in global supply chains.

Diversifying and making supply chains more resilient is also associated with digitization and the adoption of digital technologies through the supply chain. In complex, high-value products and shorter lead-time supply chains, such as medical devices and electrical equipment, digitization is a necessity for production, processes and supply. Digital technologies, such as advanced automation, additive manufacturing (three-dimensional printing), machine learning, artificial intelligence, robotics, the Internet of things and blockchain technologies are a step change in productivity, distribution, logistics and procurement efficiency. At the firm level, the increased adoption of such technologies facilitates efficiency, cost reduction, valuation and competitive advantage. Goering et al. (2018) estimate that companies “that aim well and execute effectively” can expect technology-enabled manufacturing and delivery in advanced industries to bring productivity gains and cost savings, with a near-term impact of 200–600 basis points of margin expansion, of about \$200 billion to \$500 billion. As the use of new technologies and digital platforms has become essential for the operational effectiveness and cost-efficiency of firms and for heightened supply chain resilience, the affordability and increased access to such digital technologies will be required for African economies to become attractive partners or destinations in the quest for supply chain diversification and resilience. Accelerating technological transformation in Africa will not only foster its supply chain and operational capabilities but will allow African firms to better position themselves to take advantage of supply chain opportunities.

Companies that have an interest in expanding their supply chains and building partnerships with suppliers located in new markets, such as Africa, could access potential African markets through joint ventures with domestic firms or mergers or acquisitions with foreign manufacturers and supply chain service providers that have a presence on the continent. Creating such partnership opportunities between well-established firms

³⁰ Lowered tariffs and other preferential access to materials and inputs under free trade agreements and regional trade agreements.

in the global supply chain and emerging domestic firms in Africa will have spillover effects relating to specialization, innovation, digitization, knowledge and skills, resulting in higher-value activities, productivity gains, job creation opportunities and enhanced competitiveness in global supply chains (Research Network Sustainable Global Supply Chains, 2022).

This chapter explores the role of technology-enabled services and financing mechanisms that global companies and economies are increasingly leveraging to diversify and facilitate the resilience of their supply chains. In addition, the chapter analyses the challenges African countries and firms are facing to digitize their supply chains and build stronger supplier capabilities, which can offer African suppliers and buyers a range of opportunities for value creation and value capture in global supply chains. To become an attractive destination for technology-intensive industries and digitally interconnected production and supply chain networks, Governments in Africa and the private sector will need to ensure the necessary incentives and policies to boost local capacity, infrastructure, production, supply chains and demand.

4.1 The value of technology-based enablers and firm innovation

There is strong evidence that technology plays a vital role in the diversification and resilience of supply chains. It contributes to production efficiency, faster delivery, cost-effective product customization, enhanced information flows across supplier networks and increased supply chain integration. For instance, digital platforms and technology-enabled services allow better integration and smooth coordination between different sectors and processes and across miles-away markets, thus facilitating supply chain diversification. In addition, various technology services, including supply chain connectivity and logistics, supply chain digitization, electronic data interchange, supply chain traceability software and smart services, enable supply chain resilience and sustainability.

To address the effects of supply chain disruptions from global crises and other external shocks, companies participating in global supply chains are adopting strategies to overcome obstacles by leveraging digital technologies across multiple aspects of their supply chains. Smart manufacturing, flexible automation, optimized connectivity, digital intelligence and other advanced technology-based analytics and applications are some of the technologies and digital tools paving the way for better firm performance, productivity

and supply chain resilience. This section analyses the contribution of digitization and technology-enabled services to supply chain diversification and resilience, highlighting the potential role of African firms and incentives in boosting investment for the adoption of digital technologies.

4.1.1 How supply chain digitization could promote integration and efficiency in African firms

As diversifying and building resilient supply chains can be challenging for firms, capabilities to do so can be unlocked by the increased use of digital technologies. The complexity of supply chains, spanning multiple interconnected countries with varying taxes and regulations, servicing numerous e-commerce platforms and customers with high demand or changing behaviour, and involving broad ranges of relationships and collaborative efforts, can be a race to the bottom for many small and medium-sized enterprises. Supply chain technology thus offers an immense opportunity for small-scale firms to build and strengthen their technological capabilities and optimize their production, operations, logistics and distribution services. As data and analytics, artificial intelligence, machine learning, additive manufacturing and other technology-enabled processes and services can be utilized at all levels (from micro to large at firm level or within a supply chain), leveraging those technologies can improve the much-needed efficiency within a firm and its participation in a supply chain (Pitchbook, 2022).

According to UNCTAD (2023), blockchain technology can be used to enhance supply chain management and sustainability. Adopting digital technologies could facilitate the participation of small and medium-sized enterprises in supply chains or linkages with firms that are already part of global supply chains. Indeed, digital technologies, through online marketplaces and digital supply chain platforms, autonomous supply chains and technological devices, could improve business-to-business and business-to-consumer services between small and medium-sized enterprises and large companies that are already integrated in supply chains, thus contributing to supply chain regionalization. This also applies to those firms, regardless of size, that are not located in the same geographical areas. For instance, Internet-of-things technologies allow a digital interconnection between several machines and industries or companies in different places. Baldock (2022) demonstrates that through technology-enabled services, the integration of digitized machinery, combined with cyberdata streams and the Internet of things, facilitates supply chain efficiency.

Furthermore, supply chain digitization through supply chain automation enables greater sustainability and resilience in supply chains. An autonomous supply chain is a digital supply chain that leverages the robust combination of digital business ecosystems, the Internet of things, artificial Intelligence and blockchain technology on a digital foundation to enable connected, highly intelligent, self-aware and trusted supply chains in firms (Morley, 2022; Supply Chain Brain, 2018). For instance, a digital business ecosystem consists of the digitization of all activities, business, production, trading and finance within firms and with suppliers and customers, operating throughout the supply chain of the firms and companies concerned.

While the Internet of things ensures interconnection with all the partners within a supply chain network, blockchain technology protects the digital system against external attacks and data falsification. According to Supply Chain Brain (2018), a blockchain organizes data into a digital ledger of transactions, shared among a network's participants through a distributed computer network. In addition, blockchain can contribute to efficiency in production, supply chains and improved access to markets by facilitating different stages of the supply chain, including the following factors: procurement; information on the origin, quality and costs of goods; and closer access of small and medium-sized enterprises to corporate clients (UNCTAD, 2022d). Moreover, blockchain technology facilitates supply chain traceability, which in turn facilitates secured access to and sharing of information on data, customers, suppliers and operation time of goods and services throughout the supply chain network, from production to transformation and final consumption. Supply chain traceability also allows firms to have complete visibility, meet market demands and maximize profits.

In addition to traceability software, electronic data interchange, global business-to-business electronic trading networks, and smart services and manufactures, technology devices of autonomous supply chains offer attractive benefits. UNCTAD (2022d) shows how technology and smart services can provide conducive platforms for efficiently linking output and markets, enabling intermediate inputs of key technology-intensive services in production that facilitate complexity and diversity of manufacturing outputs. These technology devices reinforce supply chain capabilities to overcome supply chain disruption. The adoption of these digital technologies greatly depends on capabilities within a sector or country.

Most domestic firms in Africa are predominantly small and medium in size and operate outside the global supply chain network (United Nations, Economic Commission for Africa, 2020b). However, these enterprises can play an important role in supply chain diversification by integrating vertically or horizontally into the supply chain. For

instance, by engaging in business-to-business or business-to-consumer collaboration, they can set up complementary businesses (vertical integration) or similar businesses in other localities (horizontal integration). Also, larger firms could seek vertical or horizontal integration in start-ups and small and medium-sized enterprises to diversify and regionalize their supply chains. Vertical integration enables a company to expand into upstream or downstream activities, thus allowing the integrated companies to streamline their operations and supply chains by acquiring or establishing their own suppliers, manufacturers, distributors or retail locations instead of outsourcing or relying on external suppliers (Hayes, 2022). Horizontal integration, on the other hand, enables a company to broaden its operations at the same value or supply chain level and within the same industry, thus allowing the integrated companies to reach into new markets, diversify their product offerings and reduce competition (Kenton, 2022). These two types of integration are better facilitated with the use of technology services at all stages, whether transactional or operational.

Collaboration and horizontal integration could be particularly beneficial for informal small and medium-sized enterprises, providing them with added opportunities to formalize, access markets and information, and create profits margins or turnover. For instance, the digitization of their operations, production and distribution or the business or operational integration of technological services, for example, through the creation of company webpages, online marketplaces and e-commerce platforms, provide more visibility for firms throughout regional and global supply chains. Furthermore, integration with small and medium-sized enterprises in different localities (horizontal integration) and as part of post-sale services in localized economies (vertical integration) will allow large companies to obtain channels closer to customers in various localities and enable the regionalization of their supply chains.

However, most of the technology-enabled services and digital platforms required for supply chain diversification and resilience are non-existent in many African countries, owing to infrastructure challenges, limited investment in innovation, lack of institutional framework and regulation, as well as information asymmetry and lack of visibility (Kuteyi and Winkler, 2022). Except for some pockets of achievement in countries that have developed logistics and smart services for business-to-business platforms – Egypt, Kenya, Mauritius, Nigeria and South Africa – countries in Africa have generally failed to integrate global supply chains. Autonomous supply chains, considered the supply chains of the future, do not exist in Africa, except in South Africa. Box 15 illustrates the case of South Africa and how its technological advancement has been a driving force for its competitiveness and integration into global supply chains.

Moreover, Organisation for Economic Co-operation and Development (2022a) showed that digital transformation in Africa could strengthen producer competitiveness, reduce cross-border trade costs, make trade-related institutions more efficient and facilitate the implementation of the African Continental Free Trade Area. Digital transformation also allows firms, including small and medium-sized enterprises, to work around formal contract enforcement constraints and integrate informal actors. It will enable them to realize productivity gains, streamline cross-border trade and ensure the safe and seamless flow of data across borders for competitive regional and global supply chains (Organisation for Economic Co-operation and Development, 2022a).

Box 15

South Africa: An example of successful diversification through supply chain networks

As an upper-middle-income country and the most industrialized economy on the continent, South Africa is the regional leader in supply chain diversification. It is also one of the world's leading mining and mineral-processing countries, with a diversified portfolio of minerals and large shares of world production. The country has developed robust backward linkages in mining equipment technologies and forward linkages in metal fabrication and automotive technologies. The mining upgrading and mineral beneficiation of South Africa were achieved on the back of technological innovation. The country benefited significantly from Government and private sector commitment to and investment in diversification, which bolstered its capabilities in the domestic and global supply of mining equipment for extraction, processing and beneficiation for mining houses.

The integration of companies in South Africa into global supply chains was also facilitated by the country's technological advancement, road and maritime transport networks, partnerships and regional integration. Indeed, the Government is developing an industrial strategy based on economically competitive technology platforms that address its economic and social imperatives to improve competitiveness and prepare for the fourth industrial revolution.³¹ Moreover, the country is developing technological leadership in mobile software, security software, electronic banking services, and digital landscape and transformation, including the

³¹ The fourth industrial revolution refers to the growing application of digital technologies at any stage of industrial production, from conceptualization to product design, manufacturing, distribution and recycling.

move to increasingly software-centric networks and cloud-based infrastructure to improve operational agility.

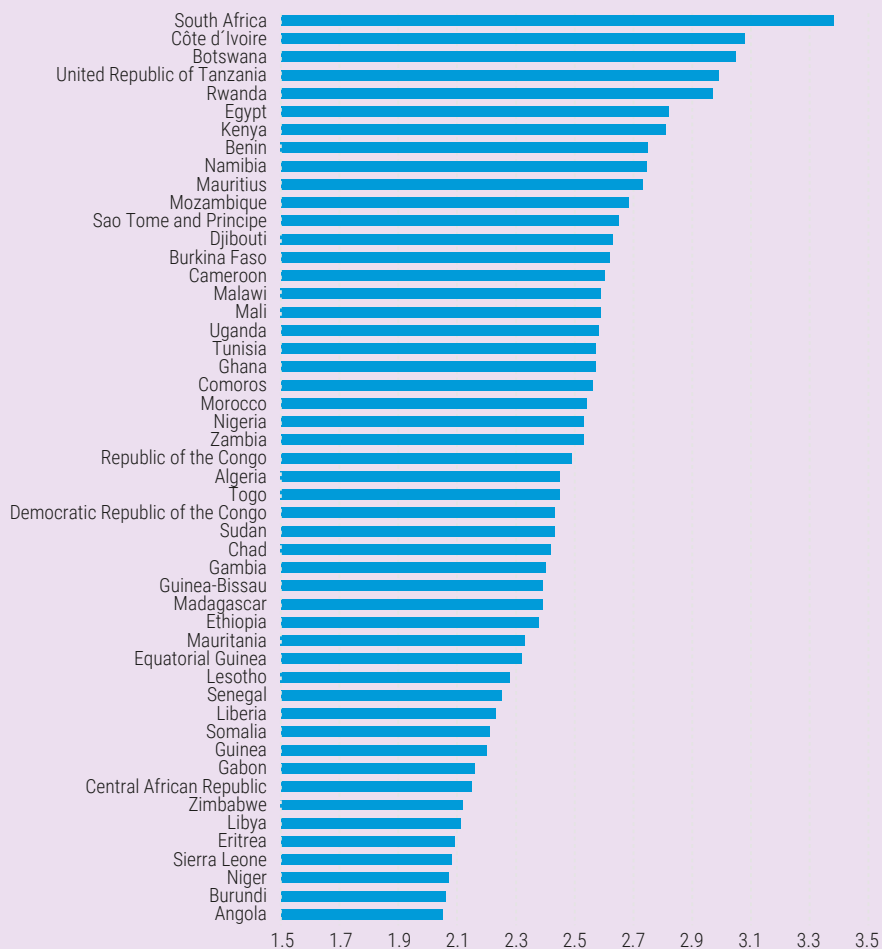
South Africa has one of the largest information and communications technology markets on the continent, and its electronics sector, similarly to the information and communications technology sector, is sophisticated and growing. In addition, the Government is embarking on an extensive skills-development programme aimed at training one million young people by 2030 in robotics, artificial intelligence, coding, cloud computing and networking. This technology boom has allowed the private sector and micro, small and medium-sized enterprises, as well as banking and other financial institutions, to embed some of the new technologies, such as machine-to-machine communication, the Internet of things, cloud computing, big data analytics, the monetization of growth in data tracking, cybersecurity, advanced robotics, artificial intelligence, smart sensors, augmented and virtual reality, and three-dimensional printing. As a result, these technologies are transforming manufacturing in South Africa and placing it among the world's 30 most highly diversified and integrated supply chains.

Moreover, the technological integration of South Africa is illustrated by its score in the frontier technology readiness index and the logistics performance index, putting the country in the first position in Africa for both indices. Its frontier technology readiness index was 0.61, compared with a global average of 0.50 in 2022³². The other African countries with a frontier technology readiness index above the average global index are Tunisia, 0.56; Morocco, 0.55; and Mauritius, 0.54. In the overall logistics performance index, South Africa also performed relatively well on a global scale and ranked the highest in Africa (3.38), followed by Côte d'Ivoire (3.08) and Botswana (3.05). South Africa performed better on average in logistics than other regions, except North America (3.81); the global index was 2.87 in 2018. See figures I and II. The logistics performance of South Africa explains the development of its supply chain connectivity and logistics.

³² The frontier technology readiness index assesses a country's readiness for using, adopting and adapting frontier technologies. It is comprised of indices of information and communications technology deployment, skills, research and development activity, industrial activity and access to finance. It ranges between 0 (lowest score) and 1 (highest score). Principal component analysis was conducted to generate the index (UNCTAD, 2021d; UNCTAD, 2023).

Figure I

Overall logistics performance indices for countries in Africa, 2018

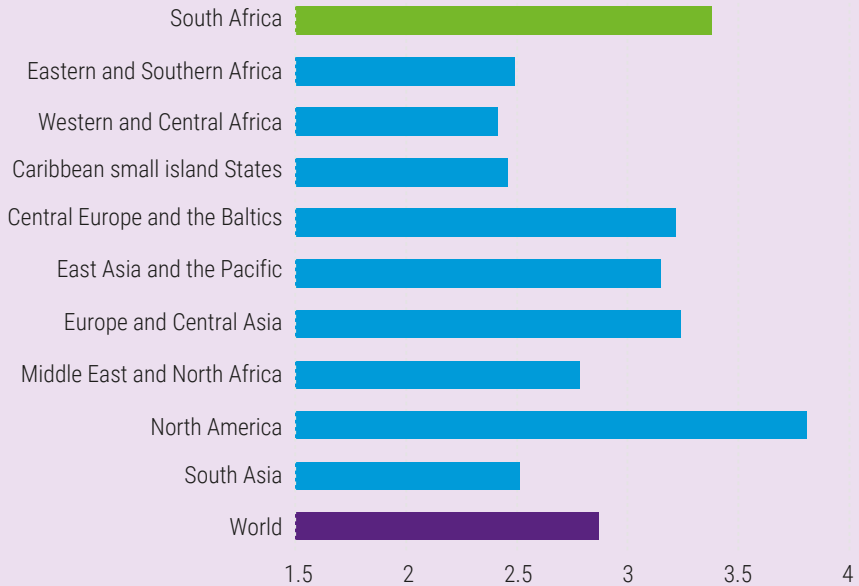


Source: UNCTAD calculations, based on World Development Indicators (World Bank).

Notes: Index scores range from 1 (low) to 5 (high). Data were unavailable for Cabo Verde, Eswatini, Seychelles and South Sudan. For Botswana, Ethiopia, Namibia, Mozambique and the United Republic of Tanzania, data were reported in 2016.

Figure II

Overall logistics performance indices for South Africa and selected world regions, 2018



Source: UNCTAD calculations, based on World Development Indicators (World Bank).
 Note: Index scores range from 1 (low) to 5 (high).

Source: UNCTAD.

4.1.2 Defying the challenges and leveraging the technological potential of Africa for supply chain diversification

Creating robust and resilient regional supply chain corridors in Africa could be the solution to its integration in global supply chains and lead to its participation in global supply chain diversification. Africa, with its growing economies, consumer markets and regional opportunities to achieve regional market access and economies of scale under the African Continental Free Trade Area, for example, is a strategic option for moving towards resilient supply chains. However, analysing foreseeable challenges and opportunities to ensure the

establishment of resilient networks on the continent (for example, facilitating good visibility and resilient sourcing, manufacturing and distribution activities) will be foundational knowledge and provide the basis for assessing the benefits and anticipating the risks of diversifying into Africa as a road map for global supply chain diversification and resilience.

Many of the foreseeable challenges are not new and include inadequate infrastructure capacity, low level of skills and technology capacity, and lack of access to affordable working capital and other financing means. Such operational and structural challenges affect the ability of African companies to supply goods and services efficiently and reliably, and therefore are perceived as uncompetitive in a dynamic and ever-evolving globalized world. For instance, the high cost and low quality of infrastructure in Africa, including information and communications technology, railways and road transportation, can easily have an impact on supply chains, causing delays in ports and on the roads and increasing the cost of transaction and exchange of information at every stage of the supply chain. As a result, this reduces the effectiveness of supply chain logistics and management. The continent operates less than 70 ports, many of which are poorly equipped and uneconomically operated, with delays two or three times greater than the global average (UNCTAD, 2022a). Efforts at increasing the levels of digitization and technology, in tandem with adequate transport infrastructure and Internet connectivity, will be necessary to address the operational and structural challenges affecting supply chain diversification in Africa.

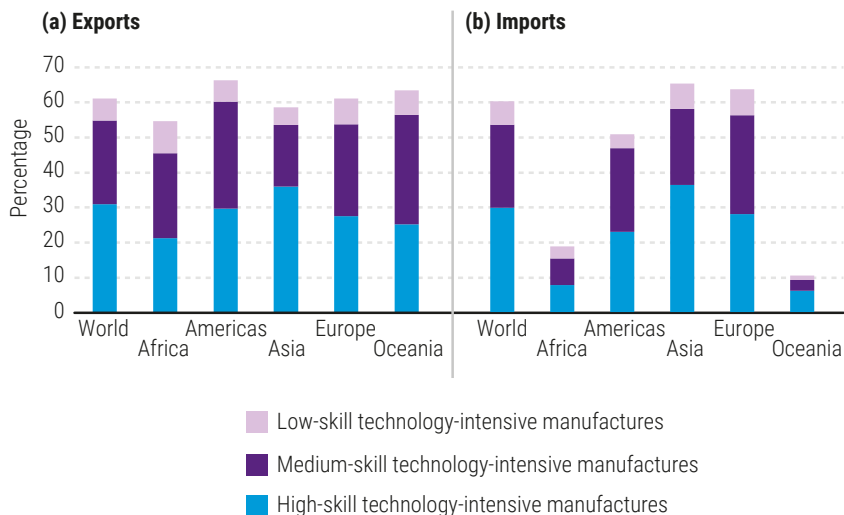
Despite the importance of technology in the supply chain, most African countries are not entirely up to date in trading technology-enabled goods and services. The level of transformation of raw materials for high-skill technology-intensive manufactures is low, limiting opportunities for value capture and participation in global supply chains. While on average, high-skill technology-intensive manufactures³³ represented almost 30 per cent of total exports of goods worldwide in 2017, in Africa, these goods made up only 7.7 per cent of high-skill technology-intensive manufactures in 2017–2021 (figure 28). This is the smallest proportion in all regions, except Oceania (6 per cent), behind the Americas (23 per cent), Europe (28 per cent) and Asia (36 per cent). In Africa, the share of medium-skill technology-intensive manufactures is also low.³⁴

³³ High-skill technology-intensive manufactures include office and automatic data-processing machines, telecommunication equipment, chemical products, medicinal and pharmaceutical products, fertilizers, and cinematographic and photographic supplies.

³⁴ Medium-skill technology-intensive manufactures include household-type equipment, apparatuses for electrical circuits, boards, panels, articles and materials of rubber, engines and motors, agricultural machinery, civil engineering and contractors' plants and equipment. Low-skill technology-intensive manufactures include food products, beverages, tobacco, textiles and apparel, leather and footwear, and wood and paper and related products.

Figure 28

Share of low-, medium- and high-skill technology-intensive manufactures in exports and imports, 2017–2021



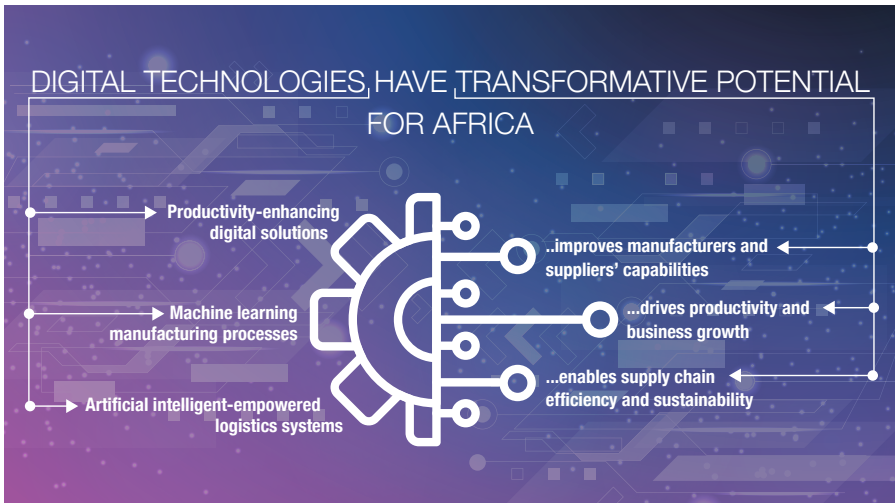
Source: UNCTAD calculations, based on data from UNCTADstat database.

Note: The classification is derived from the UNCTADstat database (2023) on manufactured goods by degree of manufacturing groups (Standard International Trade Classification Revision 3).

The low level of technology in African exports is not compensated by its imports, as Africa remained in the last position for imports in high- and medium skill technology-intensive manufactures (figure 28) in 2017–2021. In addition, the imports of high and medium skill technology-intensive manufactures have experienced a slow increase over the last ten years in Africa. The share of high-skill technology-intensive manufactures in total imports in goods has increased from 18.6 per cent in 2011 to 22.3 per cent in 2021, while the share of medium-skill technology-intensive manufactures in total imports in goods has decreased from 24.1 per cent in 2011 to 23.8 per cent in 2021 in Africa. The low levels of technology-intensive manufactures imply very limited or lack of research and development and innovation in African manufacturing industries. It is clear that African countries need to invest more in innovation and technology and provide conducive environments for technological transformation to unfold in order to develop its manufactures and integrate more effectively global supply chains.

The levers of the emerging digital ecosystem in Africa

As global companies are embracing technology and innovations to optimize supply chain practices, their appetite to expand their sourcing locations will generally materialize in markets with readily available advanced technologies and capabilities. While such technological capabilities are lacking in many African markets, the digital momentum on the continent, compounded by its demographic dynamics (a young and growing population, a promising large consumption market and technology-oriented small and medium-sized enterprises) can favour the adoption of new digital technologies and create greater opportunities that can deepen the region's footprint in global supply chains. See chapter 2 for additional analysis on demographic dynamics in Africa. It is broadly acknowledged that the use of digital technologies³⁵ can improve end-to-end supply chains with increased traceability, transparency and information flow and enable firms to generate maximum benefits from the production and supply of higher-margin products (Gandhi, 2022).



In Africa, the adoption and use of these new digital technologies can also contribute to increased entrepreneurship, job creation and better incomes. This, in turn, can increase consumer welfare and purchasing power, an important decision-making factor for industries looking into supplying the growing consumer markets in Africa. For

³⁵ Digital and data infrastructure, productivity-enhancing digital solutions, machine-learning manufacturing processes, artificial intelligent-empowered logistics systems and other technology-enabled procurement, marketing and financing solutions.

instance, in Nigeria, improved digital and data infrastructure and a wider use of digital communication technology, measured by three or more years of exposure to Internet availability, resulted in greater labour force participation (by 3 percentage points), wage employment (by 1 percentage point) and total consumption (by 9 percentage points). Further, the proportion of Nigerians living below the extreme poverty line of \$1.90 per person per day declined by 7 per cent (World Bank, 2023b). Similar welfare outcomes and firm productivity through innovation and the use of more sophisticated digital technologies are also observed in other African countries – Ghana, Kenya, Malawi, Senegal and the Republic of Tanzania, to name a few.

In Senegal, for example, Cirera et al. (2021) find a positive correlation between a firm's use of more sophisticated digital technologies and better productivity performance, measured by value added per worker. Under the UNCTAD frontier technology index (UNCTAD, 2023), Senegal in 2022 obtained a low score (128), which can be partly explained by obstacles to adopting technologies that are associated with higher productivity. In a survey of about 1,800 small, medium and large firms in Senegal for the use of digital technologies, about 70 per cent of respondents considered the lack of capabilities to be major barriers to the adoption of technologies in their operations, while 60 per cent cited the lack of finance (Cirera et al., 2021). This suggests that appropriate policy measures to overcome these obstacles could improve the effective diffusion and adoption of frontier technologies by firms in Senegal. The policy implications are presented in greater detail in chapter 5.

Another market that has rising potential for innovation and digital technologies is Kenya. It has one of the highest digital skill adoption rates in Africa, meaning that about one third of its population is able to use digital devices and applications. By 2030, about 55 per cent of jobs in Kenya will require some level of digital skills, with the industry and services sectors requiring the highest rates of digital adoption (International Finance Corporation, 2021a). The country's high digital literacy and its thriving information and communications technology sector are key drivers of the adoption of digital technologies, giving impetus to the rise of cutting-edge start-ups and technology-empowered companies. According to International Telecommunication Union (2021), Kenya has one of the largest and growing international bandwidths per Internet user on the continent, with 566.41 kilobits per second and a compounded annual growth rate of 52 per cent during the period 2015–2019. Some of the emerging technologies that are increasingly being deployed in Kenya and which can be leveraged to boost specific industries and supply chains (for example, innovation, product design, manufacturing, logistics and supply chain management), include artificial intelligence, the Internet of things and cloud-computing technologies, such as blockchain. This growing technology-aware

ecosystem in Kenya, also known as the Silicon Savannah, has benefited from sound policies, a business-friendly regulatory environment and other government-led skills, upgrading and digital technology adoption programmes, including the establishment of technology hubs and incubators (International Telecommunication Union, 2021).

One technology that is becoming the norm in optimizing supply chain operations and is gaining momentum and widespread use in Africa is blockchain. The use of this technology in supply chains enables fast and efficient sourcing and delivery of products, enhances coordination between suppliers and buyers and can improve supply chain participating firms' access to finance (Gaur and Gaiha, 2020). A blockchain, which is a digitally distributed ledger or data-recording technology that can record supply chain transactions, such as information flows, inventory flows and financial flows among multiple suppliers, buyers and service providers in a transparent, verifiable and tamperproof way, does not only improve traceability of end-to-end supply chains, but it can also reduce operational, administrative and logistics costs and mitigate potential risks from supply chain malpractice (Deloitte, 2017a). Mining companies, such as DeBeers of South Africa, are increasingly using blockchains to ensure the traceability of authentic, registered and conflict-free movement of minerals within their supply chains, from mining to delivery, thus minimizing the risk of corruption, cutting transaction costs and increasing profit margins (Oke et al., 2022).

Blockchain and other advanced technologies provide valuable tools and platforms that can meet the financing needs of African firms and potential suppliers or service providers in supply chains. For instance, banks and other credit providers can also use blockchains to improve supply chain financing, as they will enable them to make better lending decisions in a fast and cost-efficient manner by having access to real-time and verifiable transactions between suppliers and buyers without having to conduct physical audits or pay for financial reviews (Gaur and Gaiha, 2020). And for firms, whether suppliers or buyers, the increased visibility between the different supply chain partners and the traceability of supply chain operations and transactions through the use of blockchain-enabled solutions or other secured digital platforms can also help tackle some of the operational and financial challenges they encounter when participating in supply chains, and thus improve their operational reliability and creditworthiness (Loannou and Demirel, 2022). The next section will analyse in greater detail the financing solutions that are necessary for a firm's operational efficiency in supply chains. Opportunities for firms in Africa seeking to integrate supply chains and optimize their potential for supply chain diversification will also be explored.

4.2 Financing solutions for market-creating innovations

Enabling technologies such as artificial intelligence, the Internet of things, three-dimensional printing, robotics, machine learning, digital manufacturing solutions, logistic technology and blockchain, can provide competitive advantage and cost-efficient business models to companies and suppliers that may decide to diversify in Africa and build relationships between suppliers and customers. Targeting or investing in market-creating innovations can also have a spillover effect on local entrepreneurs in terms of improved innovation, skills and management, with the potential to drive growth and the funding of future innovations and supply chains in African countries. Christensen et al. (2019) define market-creating innovations as new markets that serve people for whom no goods or services exist or are made accessible and affordable. Therefore, innovations will be required to make new goods or transform complex and expensive goods and services into simple and affordable ones that “unconsumers”,³⁶ a group of consumers or population not previously targeted, can easily access. Facilitating such market-creating innovations will not only create new goods, services and markets, but they will also develop the necessary distribution and logistics infrastructure and generate employment – new job opportunities to manufacture, distribute, sell and service goods (Christensen et al., 2019).

In Africa, the burgeoning private sector, especially start-ups and small and medium-sized enterprises, will be key in leveraging potential market-creating innovations. The growth of small and medium-sized enterprises has long been a strong driver of economic development and employment, while financial constraints have been shown to be barriers to innovation, which is necessary to improve long-run productivity levels (Elshaarawy and Ezzat, 2022). Small and medium-sized enterprises have been characterized as the missing middle in financing: they are underserved by financial institutions because they tend to be too small and high-risk to make it profitable for the formal banking sector, yet too large to be served by microfinance institutions.

This presents a significant challenge to their potential role in market-creating innovations and high-knowledge-intensive supply chains, therefore limiting prospects to become suppliers of inputs and contribute to making supply chains more resilient to external shocks. A possible solution for creating new market innovations and facilitating the participation of small and medium-sized enterprises in supply chains in Africa is to increase the use of supply chain-related investments and finance. The section reviews

³⁶ See www.shareable.net/the-unconsumption-un-manifesto/ (accessed 2 July 2023).

the concept of supply chain finance and the financing solutions it offers firms (suppliers and buyers) that face liquidity constraints, which could be opportunities for the integration of small and medium-sized enterprises in supply chains. It also explores the current development of supply chain finance in Africa, paying particular attention to addressing the barriers to supply chain finance development and highlighting the potential role of sustainable supply chain finance initiatives, especially with a view to fostering industrial development and structural transformation in Africa.

Supply chain finance has gained increasing attention in recent years through greater consideration for the value-enhancing effect of operations-finance integration that emphasizes how the material, financial and information flows in the supply chains complement each other to optimize profit and better match supply with demand (Zhao and Huchzermeier, 2018). In 2022, the global supply chain finance market value, was \$2.187 trillion (BCR, 2023), a 21 per cent increase from 2021, and is expected to grow at a compound annual growth rate of 8.8–17.1 per cent (Allied Market Research, 2022; BFSI Network, 2021; Maximize Market Research, 2022). Africa recorded the strongest growth in supply chain finance by volume at about 40 per cent between 2021 and 2022 (from \$29 billion to \$41 billion), compared with a growth of 28 per cent for Asia, 21 per cent for the Americas and 18 per cent for Europe (BCR, 2023). Given the \$5.2 trillion global finance gap of micro, small and medium-sized enterprises in developing countries, 6.5 per cent of which came from Africa (International Finance Corporation, 2017), the growth of supply chain finance markets and products offers an opportunity to bridge this gap by providing liquidity, enhancing working capital efficiency and improving cash conversion cycles.

4.2.1 The role of supply chain finance in developing market capabilities

Access to finance for firms participating in supply chains generally involves two areas of finance: real investment and working capital financing. Real investment includes, for example, investment in physical and technological infrastructure; fixed assets, such as offices, warehouses, plants and equipment; human resources; research and development; procurement; marketing; and sales and services.

Working capital financing bridges the payment time gap between buyers and sellers or the time gap of a business between incurring costs and generating sales, so that it can manage its cash levels and needs from daily operations in an efficient manner and reduce stress to the balance sheet (BCR, 2022; Zhao and Huchzermeier, 2018). While both areas of finance are important to economic development and supply chains

integration in Africa., the next section will focus on working capital financing from the perspective of supply chain finance.

Defining supply chain finance

The world of supply chain finance is varied, complex and constantly evolving, and as such, presents definitional challenges. As there are no internationally agreed standards for supply chain finance – unlike the International Chamber of Commerce rules for letters of credit³⁷ or the Incoterms rules³⁸ – terminology relating to supply chain finance is not standardized, and it is often up to each finance provider to decide how to designate supply chain finance product offerings – whether supplier finance, payables finance, supplier payments, approved payables finance or reverse factoring. However, the term supply chain finance is also treated as the parent category that encompass all of the aforementioned variations (BCR, 2022; Trade Finance Global, 2023). In common references to supply chain finance in finance, business and international development, it is often considered as part of, or together with, trade finance (see box 16).

The standard definition of supply chain finance established by the International Chamber of Commerce divides diverse, yet related, financial instruments available across supply chain activities into two categories:

- Receivables purchase-based supply chain finance products, where suppliers obtain financing by using their receivables as collateral or selling them at a discount to a finance provider (receivables discounting, forfaiting, factoring), or a better-rated buyer initiates financing for the supplier from the finance provider (payables finance).
- Loan- or advance-based supply chain finance products, under three scenarios: suppliers or buyers receive loans and advances against an underlying asset (for example, receivables and inventory), a distributor of a large manufacturer obtains financing to hold goods for sale (distributor finance) or a supplier receives a loan for sourcing, manufacturing or conversion of semi-finished into finished goods (International Chamber of Commerce et al., 2016; International Finance Corporation, 2014).

An effective supply chain finance solution is conceived in the context of trade finance products, external guarantees, risk-sharing mechanisms and other innovations to

³⁷ Uniform Customs and Practice for Documentary Credits is a set of detailed international rules developed by the International Chamber of Commerce in 1933 to govern commercial letters of credit.

³⁸ The Incoterms rules were formulated by the International Chamber of Commerce and are the world's essential terms of trade for the sale of goods (see <https://iccwbo.org/business-solutions/incoterms-rules/incoterms-2020/>).

address the risk aversion of finance providers, particularly when financing for non-investment-grade-rated small and medium-sized enterprises in Africa, where the financial product landscape is generally less developed.

Box 16

Supply chain finance and trade finance

Trade finance refers to the global trade-enabling instruments used by financial intermediaries to overcome the payment time gap between exporters and importers. Examples include letters of credit, guarantees, documentary collection and open accounts. The boundaries between trade finance and supply chain finance are generally unclear. This can be illustrated by how international financial institutions deal with the issue. For example, the Asian Development Bank offers a trade and supply chain finance programme, the African Export–Import Bank presents some of its supply chain finance products under its trade finance programmes and the African Development Bank continues to offer mainly trade finance products. In the private sector, supply chain finance solutions have long been offered by big banks to large corporations, such as fast-moving consumer goods and manufacturing companies to support trade.

While it has long been suggested that more than one third of international trade is supported and enabled by trade finance, since the 2000s, open account trade, to which supply chain finance is typically applied, has grown exponentially, while traditional trade finance saw relatively slow growth. Open-account trade focuses on transactions, rather than collateral, and occurs when goods are shipped and delivered before payment is due. The buyer is directly responsible for meeting the payment obligation of the underlying transaction, as it is not supported by banking or documentary trade instruments issued on behalf of the buyer or seller. Open-account trade is no longer reserved solely for established trading relationships or trade with low-risk markets.

In addition, regulatory changes since the 2008–2009 global financial and economic crisis have favoured supply chain finance over traditional trade finance, as the Basel II Capital Accord treats trade finance more harshly, requiring a minimum duration of one year for loans and emphasizing counterparty risk. With COVID-19 commanding global attention on rethinking supply chain disruption and resilience, supply chain finance has been met with greater interest in recent years, and its potential in developing supply chains in Africa could be transformative.

Sources: UNCTAD, based on African Development Bank, 2023; African Export–Import Bank, 2017; African Export–Import Bank, n.d.; Asian Development Bank, 2023; Garnizova and Khorana, 2021; Herath, 2015; International Chamber of Commerce et al., 2016; Shrivastava et al., 2019.

In recent years, supply chain finance has benefited from the emergence of technology-enabled service platforms, which connect counterparties more efficiently and enable innovative solutions in the face of growing trade complexities. Figure 29 provides a stylized illustration of how supply chain finance products work. For example, the availability of procure-to-pay automation, in which purchasing and accounts payable systems are integrated in the buyer's procurement management process relating to independent third-party platforms, has allowed buyers and suppliers to gain better access to financial services and facilitated access to multiple liquidity providers, and thus more efficient matching of demand for and supply of funds. Buyers and suppliers could electronically submit approved invoices to a supply chain finance platform, and the financial provider partnered with this platform would receive and review the payment requests and provide funding to the supplier after risk assessment (Herath, 2015). As more supply chain finance actors participate in these integrated platforms, data analytics can be conducted more effectively to predict supply chain finance demand and supply.

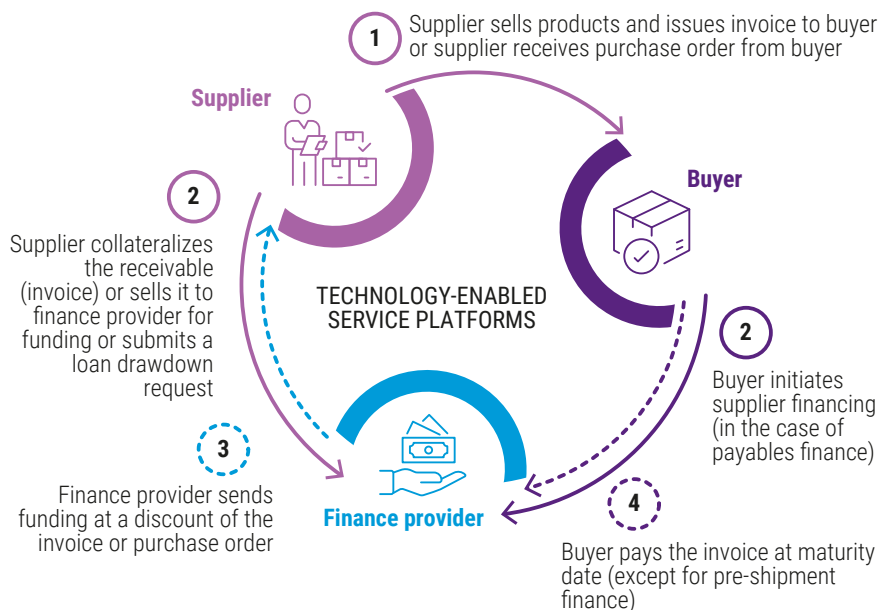
At the most granular level, supply chain finance can be defined as approved payables finance or reverse factoring. This is commonly accepted as equivalent to supply chain finance by business and financial practitioners, although it is one of various supply chain finance products available (BCR, 2023; International Chamber of Commerce et al., 2016; International Finance Corporation, 2014). Payables finance is a buyer- or consumer-driven supply chain finance programme in which a large buyer approves a supplier's invoice and requests one or more finance providers to set up a receivable discounting line in favour of its suppliers. This allows the supplier, typically a non-investment-grade-rated small and medium-sized enterprise that often suffers from liquidity squeeze and difficulty in accessing sufficient working capital, to access credit based on the buyer's credit worthiness. The finance provider grants the financing without recourse to the supplier, which is related to the risk of non-payment by the buyer of the invoice or account payable. *World Supply Chain Finance Reports* issued by BCR usually adopt this definition of supply chain finance.

The global supply chain finance ecosystem has been changing. Global universal banks have traditionally dominated the supply chain finance space, holding over 95 per cent of programmes as of 2005, the remainder being split between platform providers, such as Orbian and Prime Revenue (Herath, 2015). However, the growing importance of supply chain finance has attracted rapid innovative development in the space with financial technology firms entering the market that offer greater digitization in supply chain finance product offering and implementation, such as innovative business models, improved digital interfaces and simplified onboarding (Herath, 2015). The innovation of

financial technology firms has the potential to significantly improve the reach of supply chain finance products and facilitate economic activities along the supply chains.

Figure 29

How supply chain finance works



Source: UNCTAD, based on Herath, 2015; International Chamber of Commerce et al., 2016; International Finance Corporation, 2014.

4.2.2 How supply chain finance can drive the participation of small and medium-sized enterprises in supply chains in Africa

Scaling innovative supply chain finance solutions has the potential to significantly improve small and medium-sized enterprises' access to financing and competitiveness in a well-integrated supply chain that could further increase employment, income, quality of life and economic growth in Africa (International Finance Corporation, 2021b).

Indeed, supply chain finance enables small and medium-sized enterprises previously considered unbankable for traditional trade-finance products to access credit. According to Auboin et al. (2016), factoring, which is mainly employed by firms involved in global supply chains, has a positive effect in allowing small and medium-sized enterprises to access capital and international trade, given its availability. For example, Kenya faces a financing gap of \$19.3 billion with a lack of financial products for the missing middle (firms valued at K Sh100,000–K Sh1,000,000) as microenterprises benefit from the microfinance market. Scaling supply chain finance could bridge 54 per cent of small and medium-sized enterprises' financing gap and reduce liquidity gaps between suppliers and buyers (International Finance Corporation, 2022a).

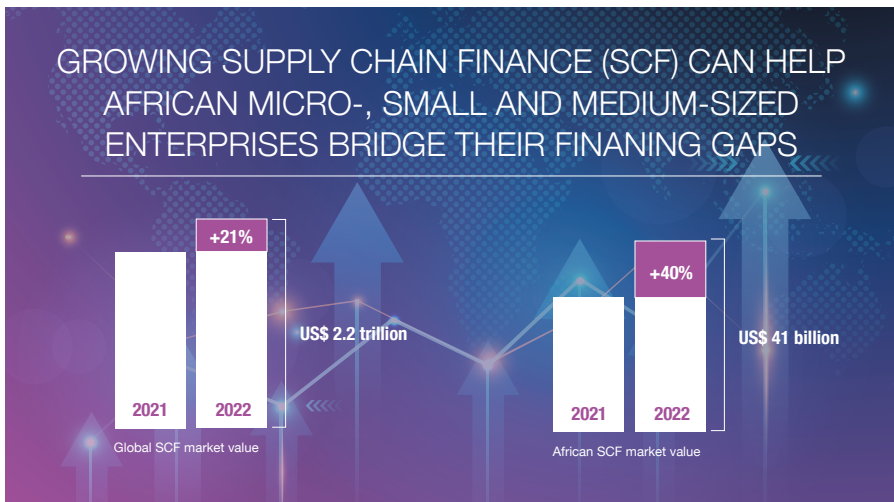
More importantly, beyond financing, supply chain finance can be particularly effective in forming forward and backward business linkages and facilitating clusters of small and medium-sized enterprises by providing the well-needed financing at each different trigger event along the physical supply chains, which improves the competitiveness of firms along the supply chains (Garnizova and Khorana, 2021). For example, a China-based pharmaceutical wholesaler (Real Can or Ruikang) built a blockchain solution for supply chain finance with China Zheshang Bank that would give it faster, more reliable data, financing needs assessment and payment with nearly 1,000 pharmaceutical manufacturers that it works with, thus strengthening its backward linkages (Wood, 2019).

As many small and medium-sized enterprises struggle to manage cash flow and working capital and are unable to buy inventory due to the liquidity gap created by delayed payments, supply chain finance can allow them to better manage liquidity and cash, giving room to both buyers and sellers to undertake other physical or financial transactions without harming their cash flow, reducing transaction costs and decreasing risk associated with serving smaller and riskier firms (International Finance Corporation, 2014; Trade Finance Global, 2023). For example, factoring may allow a high-risk supplier to transfer its credit risk to a highly rated buyer (Klapper, 2006). Payables finance also takes the underlying receivable off the supplier's balance sheet, thus improving its credit metrics. More importantly, supply chain finance could potentially help not only tier 1 and 2 suppliers, but also last-mile merchants in delivery of goods up to the last stage (consumer), helping them to expand and increase revenues (BCR, 2023).

In Africa, the use of supply chain financing mechanisms can enable small and medium-sized enterprises to obtain improved access to working capital and provide them with a cushion to further invest and develop the technological and knowledge intensity of their production of goods and services along the supply chains. And for

foreign firms looking into diversifying their supply chains, supply chain finance can provide them with a powerful way to enter the African market and relocate some of their production and distribution to the continent, with improved assurance that local suppliers and buyers will not be financially constrained, thus lowering financial risk. Supply chain finance products, such as factoring, facilitate access to new territories without taking on country risk, as underwriters mainly place the risk on the receivables, payables, inventory, or purchase orders and unapproved invoices (which display varying degrees of risk themselves), rather than the firm itself.

Supply chain finance also provides valuable benefits for finance providers. It helps broaden a financial institution's customer base by providing access to new, small and medium-sized-enterprise clients, which increases opportunities for cross-selling (International Finance Corporation, 2014). With improved relationships and understanding, finance providers can further expand their range of products, focusing on core customers to maximize synergies and gains. In addition, automation in a typical supply chain finance transaction could ease reconciliation and forecasting processes of trade transactions. Compared with traditional trade finance, this can lower costs for banks that lend money to firms. At present, however, too few African banks are providing supply chain finance solutions or promoting a continent-wide supply chain finance market, which hinders data collection related to supply chain finance potential in Africa and thus makes it difficult to predict trends accurately in supply chain finance.



Although supply chain finance is seen as a productive way to grow businesses and finance trade and liquidity for an economy's long-term structural transformation since its use in the 1990s, it has remained a financial product mostly used in advanced economies and emerging markets in Asia and Latin America, reflecting the levels of financial market development across regions. Looking at supply chain finance defined solely as payables finance, Africa contributed to only 1.9 per cent of the global supply chain finance volume of \$2.2 trillion in 2022 and remains the most underdeveloped supply chain finance market across regions (figure 30(a)). However, supply chain finance growth in Africa is accelerating, led by financial technology companies offering digital platforms for collection, payment and lending (BCR, 2023), especially after experiencing supply chain disruptions during the outbreak of COVID-19. Furthermore, while the year-on-year growth of global total supply chain finance volume has stayed in a consistent range of 25–38 per cent, Africa has experienced a much more volatile growth path, compared with other regions, suggesting relatively unpredictable supply chain finance market supply and demand (figure 30(b)). However, the bright spot is that while other regions witnessed a slowdown in supply chain finance market growth in 2022 due to the lingering effects of the COVID-19, Africa was the only region that saw an accelerated growth at 41 per cent year-on-year, owing to its sustained growth momentum from a low base and potential financial technology and financial technology-enabled investments, which have increased by more than 200 per cent to \$2 billion in 2021 over 2020 (UNCTAD, 2022d).

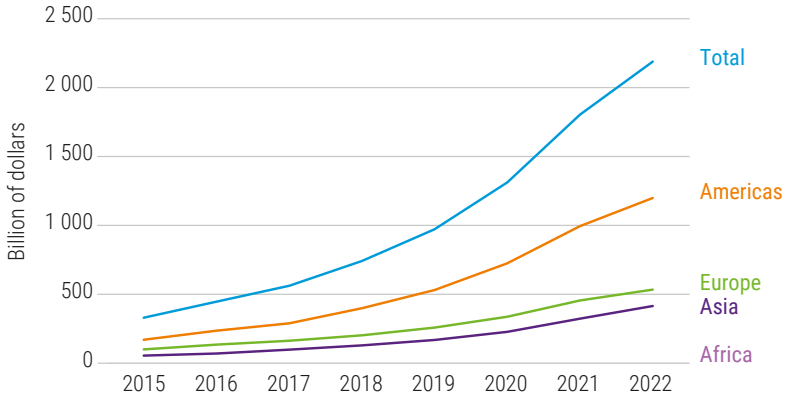
Another fast-growing and evolving financing solution that can provide opportunities for African firms to access finance and build supply chain relationships with foreign companies are mergers and acquisitions. Box 17 highlights recent merger and acquisition investment trends in Africa and describes how these investment opportunities can make Africa an attractive destination for multiple investors and companies participating in global supply chains.

Overall, the supply of supply chain finance continues to be far below demand, with diverse situations across the continent. For instance, in Kenya, supply chain finance supply has only reached 7–10 per cent of the \$24.8 billion (K Sh2.8 trillion) estimated market, or 25.1 per cent of GDP, of which small and medium-sized enterprises generate about 42 per cent, in terms of annualized value of financial payables, receivables and inventory (International Finance Corporation, 2022a). In Nigeria, the estimated market for supply chain finance is \$6.6 billion (₦2.7 trillion) of which small and medium-sized enterprises generate more than half (International Finance Corporation, 2022b). In both Kenya and Nigeria, the manufacturing sector generates the greatest demand of the supply chain finance market – almost 40 per cent in Kenya and 35 per cent in Nigeria – owing to

Figure 30

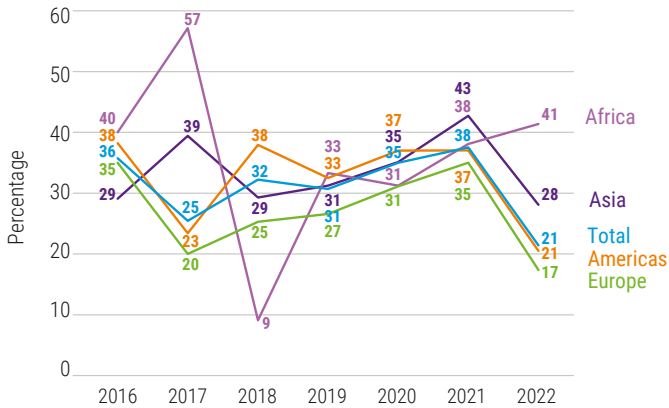
Global supply chain finance volume and growth, 2015–2022

(a) Volume



Africa	5	7	11	12	16	21	29	41
Americas	170	235	290	400	530	726	995	1199
Asia	55	71	99	128	168	227	324	415
Europe	100	135	162	203	257	337	455	534
Total	330	448	562	743	971	1311	1803	2189

(b) Year-on-year growth



Source: UNCTAD, based on data from BCR, 2023.

Note: Global supply chain finance refers to payables finance only.

the high volume of transactions in the sector's supply chains. International Finance Corporation surveys (2022a, 2022b) further show that in Kenya, commercial banks are the largest providers of supply chain finance at about \$1.7 billion–\$2.6 billion, while microfinance banks, microfinance institutions, and factoring and financial technology companies have also started to launch supply chain finance products to close financing gaps. In Nigeria, commercial banks do not lend much to micro, small and medium-sized enterprises, while 80–90 per cent of lending is working capital financing; non-bank financial institutions, such as merchant banks, financing companies and microfinance banks, offer limited supply chain finance products. In countries such as South Africa and Zambia, supply chain finance programmes were set up to unlock working capital and support local businesses. For example, South African Breweries Miller adopted an advanced supply chain finance solution facilitating the production and supply of empty bottles in soft-drink plants and breweries. (African Export–Import Bank, 2017). In Zambia, a supply chain finance programme to manage pharmaceutical supply chains, involving technical assistance and lending, was implemented through a government contract with International Business Machines.

Box 17

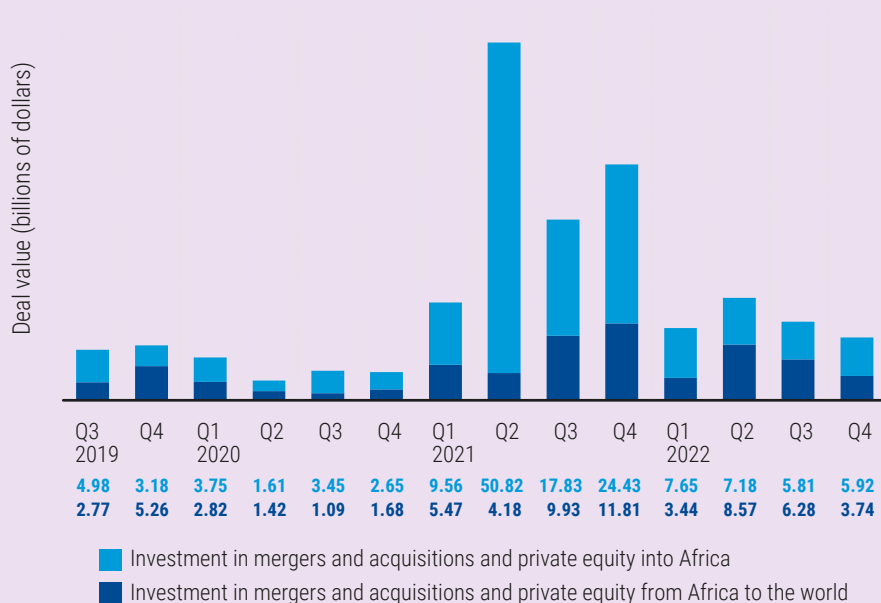
Opportunities in the area of mergers and acquisitions

Mergers and acquisitions hold significant potential for small and medium-sized enterprises in terms of efficiency, capability and innovation. By definition, these transactions provide integrated firms and their suppliers with a powerful platform to merge and transform two distinct supply chains into an integrated model that creates competitive advantage in terms of cost and operations. While the objectives of entering into such a transaction can vary, most firms that do so consider assessed risks or vulnerability in the supply chain. These firms share similar objectives: improving supply chain visibility, securing supply sourcing, expanding scale capacity, broadening capabilities and increasing value chain adaptability.

A look at the performance of merger and acquisition and private equity markets in Africa, especially in 2019–2020 when the world was in turmoil and supply chains were disrupted, can reveal key trends in investment opportunities. Figure I shows a spike in investment in mergers and acquisitions and private equity in Africa during the first half of 2021, despite the impact of the COVID-19 pandemic and other global pressures on markets. Merger and acquisition and private equity investment flows into the continent peaked at a total value of \$50.82 billion during the second quarter of 2021.

Figure I

Africa: Investment in mergers and acquisitions and private equity, third quarter 2019–fourth quarter 2022

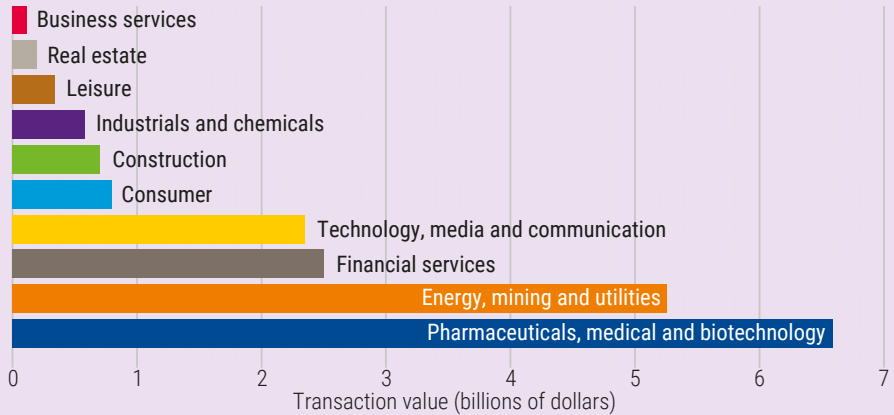


Source: UNCTAD calculations, based on Mergermarket database (see <https://info.mergermarket.com/>).
 Abbreviation: Q, quarter.

Figure II demonstrates the significance of the energy, mining and utilities sector, as well as the pharmaceutical, medical and biotechnology sectors for African acquirers and local entrepreneurs, whose share of transaction value has been growing by about 5 per cent per year. When combined with financial services, the energy, mining and pharmaceutical sectors account for about 74 per cent of total merger and acquisition investment by African firms on the continent. The growing African-led mergers and acquisitions on the continent and the emergence of African private equity investors can be explained by two major trends: the rise and attraction of technology-based start-ups and the growth potential of regional markets (African Continental Free Trade Area), which are opening up more and more opportunities for domestic acquirers and foreign players.

Figure II

Investment in mergers and acquisitions by companies based in Africa, 2022



Source: UNCTAD calculations, based on Mergermarket database (<https://info.mergermarket.com/>).

Sources: UNCTAD, based on Deloitte, 2017a; El Fihri et al., 2021; Kearney, 2022.

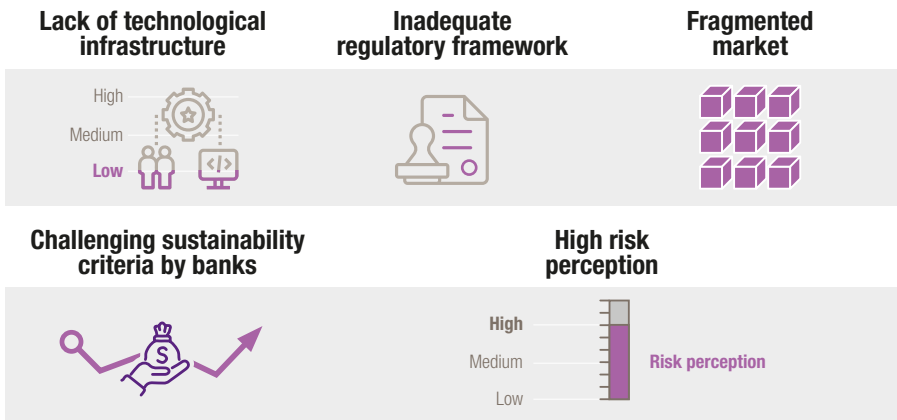
4.2.3 Financing solutions as enablers of liquidity and innovations in supply chains

Supply chain finance growth is needed to raise the industrial output and stimulate structural transformation in Africa as regional supply chains become more sophisticated in the context of the African Continental Free Trade Area. For firms (designers, manufacturers, distributors, sellers and buyers) to enter and operate in supply chains, barriers to the greater use of supply chain finance pose major limitations to their competitiveness. In the case of factoring, for example, its development could be impeded by anti-money laundering or know-your-customer regulations, and buyer performance, which is related to supply chain finance default risk and profitability, according to members of Factors Chain International, widely known as FCI (Factors Chain International, 2022).

In general, African countries often face a disproportionately higher risk perception by major global financial players, which hinders the expected and necessary financial flows into the continent and feed into their currency risk. Some countries in Africa are constrained by

low or nonexistent country risk ratings, weak banking systems, lack of credit information and regulatory requirements. A survey of small and medium-sized enterprises across 49 countries in Africa conducted by the African Development Bank concluded that such enterprises exhibited a default rate of 10–11 per cent during 2015–2019, which is materially higher than the default rate observed in global trade finance portfolios of below 1 per cent (African Development Bank, 2020). This prevents some financial institutions from extending credits to certain countries altogether, as their credit selection process might include minimum rating and information requirements. The high rate of informality among micro, small and medium-sized enterprises in Africa further prevents their eligibility for formal-sector financing, including supply chain finance. A lack of infrastructure, in particular reliable electric power, transport and telecommunications, compounds the difficulties of establishing well-integrated supply chains across the continent.

Challenges to supply chain finance growth:



There are five main types of barriers to supply chain finance service provision in Africa: technological infrastructure; legal and regulatory framework; knowledge, education and risk perception of local firms; a fragmented market; and sustainability (African Export–Import Bank, 2017; International Finance Corporation, 2021b). Addressing these challenges will not only increase innovative opportunities for African firms, specifically in the realm of liquidity and working capital management, but it will also help overcome some of the obstacles multinational companies could face when they relocate part of their upstream production of supply to Africa. This section provides detailed information on some of the main barriers that constrain the deployment of supply chain finance in

Africa. Chapter 5 provides key recommendations for leveraging supply chain finance to unleash the profit potential of African firms along the supply chains.

Technological infrastructure uptake and upgrade

Currently, there is a low level of technological capacity within banks to provide for themselves and manage supply chain finance, and they are sometimes unable to cover the costs of technology development to reach the necessary scale required of efficient operations and product offerings of supply chain finance (International Finance Corporation, 2021b). As a result, across the continent, there is insufficient digitization and adoption of technology in the financing process. Processing financing applications remains a highly labour-intensive process, with excess paperwork, such as for letters of credit that incur high operational and transaction costs. Based on the experience of other developing and emerging countries, such as Peru, overcoming this type of barrier could reduce trade finance operating costs by 50 per cent on average (International Finance Corporation, 2020). Although digitization and automation are in place, such innovations are not yet widespread in Africa. Integrating digital invoicing or payments systems and customer relationship management systems with those of suppliers, buyers, financial institutions and other service providers continues to be a challenge (International Finance Corporation, 2022b). Since supply chain finance requires real-time supply chain performance data flows, which can indicate fraud potential and whether lenders can conduct sufficient know-your-customer due diligence on buyers, access to reliable statistical data continues to be a major challenge to the expansion of supply chain finance in Africa.

It is therefore essential to develop technological infrastructure and the digitization of payment and invoicing processes, which is a key potential transformative factor of supply chain finance on economies. Digitization can serve as a new enabler to reconceive and develop supply chain finance ecosystems – electronic invoicing, application programming interfaces, blockchain and cloud-based solutions, for example – to improve supply chain efficiency and transparency (International Finance Corporation, 2021b). Many actors in the supply chain finance market contend that mobile technology will be key in developing supply chain finance; therefore, carrying out cross-border trading transactions with mobile platforms will be a game changer (BCR, 2019), especially since Africa is a leader in mobile banking.

Conducive legal and regulatory frameworks

Across the continent, there is a lack of a necessary homogeneous and favourable regulatory and legal framework and infrastructure to ensure the enforcement of creditors' rights in cases of conflicting claims, and to support financial technology, know-your-customer compliance challenges, public registers, electronic invoicing and electronic signatures,

for example (BCR, 2022). The legal framework is usually unable to facilitate the use of assets as collateral. This makes the expansion of supply chain finance, or generally credit financing, difficult. To build the foundation of an enabling environment for a well-functioning supply chain finance market, it is necessary to improve and enforce legal and regulatory frameworks, with more homogeneous legal frameworks to facilitate financial investment, aligned with supply chain finance pre-requisites, such as ensuring the application of laws related to dematerialization for digital invoicing, signatures and accounting (International Finance Corporation, 2020). For instance, contractual enforcement is important, as under a supply chain finance programme, the ownership of the receivables could be reassigned to a finance provider, which needs to enforce the contract and apply to court in case of non-repayment. However, this varies across the continent: Ethiopia and Morocco achieved a contract enforcement score of about 63, compared with 40 for Egypt and 28 for Angola (World Bank, 2020). Furthermore, Governments are encouraged to rigorously enforce the law, limiting payment periods to 60–90 days and setting penalties for late payers.

Regulations should be favourable but should adapt to the changing realities of global supply chains, while being vigilant of fraudsters. For example, the rise of supply chain financier Greensill Capital³⁹ was partly the result of the increasingly stringent regulations and capital restrictions on traditional banks engaging in supply chain finance. However, Greensill and other similar firms did not face levels of regulatory scrutiny that could affect their profit, which facilitated its fraudulent behaviour and eventually its bankruptcy in March 2021. This is a reminder of the need for suitable enabling government regulatory frameworks in Africa and the careful scrutiny of non-bank financial institutions and platforms.

Moreover, some observers argue that some supply chain finance products, such as payables finance, allow firms to obscure debts as they go off-balance sheet after debts to suppliers are settled quickly by a financial intermediary⁴⁰ and encourage late payments through a buyer–supplier relationship that draws from strong bargaining power. Recently, however, the Financial Accounting Standards Board in the United States required companies to disclose the terms and size of supply chain finance programmes in financial statement footnotes (Neu Group, 2022). While the level of hidden debt should be concerning for highly indebted firms, especially in countries with more advanced financial development,

³⁹ The bankruptcy of Greensill Capital, a financial services company founded in 2011 and based in Australia and the United Kingdom, was the result of risky large, multi-party supply chain financing transactions and related services (Pickard et al., 2021).

⁴⁰ This is the case of Carillion, a British multinational construction and facilities management services company that was liquidated in January 2018. It was a supply chain finance user influenced by Greensill. According to a rating agency, Carillion may have misclassified up to £498 million of debt (Pickard et al., 2021).

this should not be a major concern for firms in certain African countries that are still at the stage of increasing financial inclusion and have barely utilized their credit capacity.

Knowledge and risk perception of local firms

As supply chain finance is a relatively new trend in Africa, promoting it is a lengthy process, as most buyers and sellers still do not fully understand or accept the use of supply chain finance. Indeed, supply chain finance solutions are broadly unknown to both the banking sector and its clients on the continent. As a result, bankers lack adequate skills to effectively implement supply chain finance programmes. In a typical capital market, credit ratings are used by banks and investors to help assess credit and counterparty risks, and thus the risk premium required: A good credit rating allows the company to borrow at a lower interest rate. As such, credit ratings are essential to a company's funding access. Supply chain finance products, such as payables finance, particularly rely on the differential ratings between suppliers and buyers. However, small and medium-sized enterprises are the missing middle in financing. The traditional methods of conducting due diligence required for assigning ratings of borrowings by large companies – meeting with their management, collecting and analysing their financial statements and legal documents, conducting industry research, speaking with their suppliers and customers and making cash-flow projections – are too expensive to be applied to small and medium-sized enterprise loan applicants, who often lack financial records, credit histories and collateral (Alpert and Turlakova, 2014). Research has acknowledged the importance of credit ratings to small and medium-sized enterprise financing, proposing the use of alternative credit-rating methodologies, such as statistical analysis techniques that group small and medium-sized-enterprise customers according to financial health and adjust the interest rates for each group (Yoshino and Taghizadeh-Hesary, 2015; Yoshino et al., 2015), and integrating both the financial and vendor ratings in supply chain finance assessment (Moretto et al., 2019).

Some countries in Africa have also recognized the importance of credit ratings. In Egypt, for example, the financial regulatory authority agreed to allow small and medium-sized credit-rating companies to receive licences to operate in the country in 2019, and in 2022, the regulatory authority began facilitating the expansion of a credit-rating system based on consumer behaviour and non-financial data (Moneim, 2019; Salah, 2022). Credit-rating agencies aimed at enhancing access to affordable formal financial services have been established in a number of African countries, such as Kenya, Mauritius, Nigeria, Rwanda and Zimbabwe. Box 18 illustrates how applying private sector credit-scoring systems within supply chain finance can facilitate access to finance when supplying or buying parts, goods and services in a supply chain.

Box 18

The potential of micro-, small and medium-sized enterprise ratings to improve access to affordable supply chain financing

Ratings of micro, small and medium-sized-enterprises are a little-known concept. They have the ability to trigger financing opportunities and address the ubiquitous funding issues that plague such enterprises in developed and developing countries alike. These ratings broadly represent a large category of underlying ratings (credit, due diligence and environmental, social and governance ratings) that have been designed to facilitate access to finance from traditional and non-traditional sources, and market access as well. The non-traditional application is particularly useful, as the ratings can complement these alternative funding channels well. A pertinent example of this is within the supply chain finance channel, which is often hampered by information asymmetry among key stakeholders.

The primary objectives of small and medium-sized-enterprise-credit ratings are to decrease information asymmetry and properly articulate a business's financial, strategic, operational and economic positioning. Of relevance to the supply chain finance channel is the focus of these ratings on the rated entity's financial health, main suppliers and customers, and strategic advantages. These metrics are of particular importance within a supply chain finance transaction and could be further tailored to include a specific ranking scale that could compute the probability of default for such transactions. The structured finance market linked to supply chain finance providers and related stakeholders is a viable concept in principle; however, events such as the global financial and economic crisis or the collapse of financial services companies highlighted the importance of obtaining comprehensive information on underlying individual credit exposure.

The aforementioned rating concept can provide such information, thereby improving transparency, credit quality and investor confidence. This could have positive effects on the credit quality of overall structured finance issuances, as well as the underlying costs associated with such transactions. The rating concept can be used to rate individual exposures or an entire portfolio of supply chain finance exposures and can thus be an optimal solution to increase the availability and viability of these structured transactions. Furthermore, micro, small and medium-sized enterprises are in some instances excluded from supply chain finance transactions due to the tenuous availability of information on these entities. As such enterprises make up the largest number of businesses within emerging markets, these ratings could then be a viable tool to increase the feasibility of supply chain finance on a wide scale and address the perennial issue of access to finance. Although these ratings have been effective at delivering on their intended mandate, the concept is not widely available.

Sources: UNCTAD, based on Credit Rating Analytics, 2023 (see www.creditratinganalytics.co.za).

Lowering barriers to financing through regional integration of supply chains and innovative foreign exchange hedging

As distribution and logistics channels and infrastructures across Africa remain weak, economies of scale are difficult to achieve, when compared with China, India and countries in South-East Asia. There are still challenges to integration and coordination between supply chains in different markets. Fragmented markets often see extremely competitive markets with price-sensitive buyers, which reduces potential profit and makes supply chain finance products appear too expensive (International Finance Corporation, 2022c). With the implementation of the African Continental Free Trade Area, regional trade is expected to pick up, and networks of raw material inputs, production and distribution will become better integrated, reducing the relative cost of supply chain finance products. Supply chains across Africa will experience much less friction and will benefit from both the flow of physical goods and of finance.

The small and fragmented markets and political risks across the continent have also made it easy for domestic and foreign firms to manage their currency risk. Great currency volatility has contributed to high foreign exchange hedging costs that makes it difficult for companies and financial institutions to conduct businesses or lending operations. For example, the onshore and offshore forward markets of the Moroccan dirham and the non-deliverable forwards of the Egyptian pound, the currencies of two of the largest economies in Africa, were overly expensive (Castell, 2021). In view of such levels of currency fluctuation, some foreign banks might choose not to extend trade finance or finance at critical stages across the supply chains related to businesses in these countries, threatening urgently needed financing for supply chain development in Africa. While it is difficult to address the issue of currency stability within a short period of time, innovative and agile foreign exchange hedging strategies could be useful in overcoming certain currency risk management concerns (Buck, 2019). Given that currencies across the continent have vastly diverse characteristics and are managed differently by central banks with heterogeneous political and economic objectives, it is essential for companies and financial institutions, both in Africa and abroad, to fully understand these dynamics when devising foreign exchange management strategies.

4.4 Conclusion

Supply chain diversification improves supply chain resilience, avoids supply chain disruption, increases demand flows and unlocks supply chain potential. Other benefits include supply chain sustainability and the ability to maximize profitability and assess

customer and supplier communities. However, Africa has little involvement in supply chains, and its supply chains are poorly diversified. The main factors constraining its participation in technology-intensive industries and supply chains are inadequate infrastructure capacity, lack of technology and skills, and poor access to liquidity and working capital.

This chapter described how viable technology-enabled services and financing solutions, such as supply chain finance, can provide innovative solutions to increase the competitive position of Africa in upgrading its industries and businesses and developing supply chain linkages to become an attractive destination for multinational companies and ultimately, to achieve supply chain diversification and resilience. In terms of technology-enabled services, most small and medium-sized enterprises in Africa are not digitized and rarely use technology-enabled services for supply chains, preventing them from forming linkages with firms already part of global supply chains. The main technology-enabled services –supply chain connectivity and logistics, supply chain digitization, autonomous supply chains, intellectual property rights and technological devices⁴¹ – are nonexistent in most of Africa.

A wide variety of innovative supply chain finance products has been developed, and it has been shown that supply chain finance plays an important role in economic development for firm competitiveness, finance providers and the economy as a whole. Yet, Africa remains the most underdeveloped supply chain finance market across global regions, including emerging markets such as Asia and Latin America. Apart from the general financial barriers faced by African firms, small and medium-sized enterprises are confronted with a fragmented market, inadequate technological infrastructure, insufficient legal and regulatory frameworks, and inadequate knowledge when engaging in supply chain finance transactions. To overcome barriers and constraints in global supply chains, small and medium-sized enterprises in Africa should reinforce their collaboration with larger domestic companies or foreign companies to create complementary businesses (vertical integration) or similar businesses in other localities (horizontal integration). Building supply chain partnerships will not only give such enterprises the opportunity to integrate domestic or global supply chains, but it will also give them a competitive edge in regional and global markets.

Furthermore, it is essential for African economies to create an enabling environment for the supply chain finance market. Such an environment will feature enhanced legal

⁴¹ Examples of technological devices are electronic data interchange, traceability software, and smart services and manufacturing.

and regulatory frameworks that can facilitate financial investment and law enforcement, improved access to business lending markets, as well as increased investment in technological infrastructure, services and digitization. Policymakers may therefore consider technology-enabled services and supply chain finance, along with supporting infrastructures and institutions, including human capital and regulations, to holistically implement policies aimed at diversifying African economies and facilitating their integration in regional and global supply chains.