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How Huawei's Localization in North Africa Delivered Mixed Returns

Tin Hinane El Kadi

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China Local/Global

China has become a global power, but there is too little debate about *how* this has happened and what it means. Many argue that China exports its developmental model and imposes it on other countries. But Chinese players also extend their influence by working through local actors and institutions while adapting and assimilating local and traditional forms, norms, and practices.

With a generous multiyear grant from the Ford Foundation, Carnegie has launched an innovative body of research on Chinese engagement strategies in seven regions of the world—Africa, Central Asia, Latin America, the Middle East and North Africa, the Pacific, South Asia, and Southeast Asia. Through a mix of research and strategic convening, this project explores these complex dynamics, including the ways Chinese firms are adapting to local labor laws in Latin America, Chinese banks and funds are exploring traditional Islamic financial and credit products in Southeast Asia and the Middle East, and Chinese actors are helping local workers upgrade their skills in Central Asia. These adaptive Chinese strategies that accommodate and work within local realities are mostly ignored by Western policymakers in particular.

Ultimately, the project aims to significantly broaden understanding and debate about China's role in the world and to generate innovative policy ideas. These could enable local players to better channel Chinese energies to support their societies and economies; provide lessons for Western engagement around the world, especially in developing countries; help China's own policy community learn from the diversity of Chinese experience; and potentially reduce frictions.

Evan A. Feigenbaum

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Summary

Trade between China and North Africa has increased significantly since the early 2000s, but it has largely reproduced patterns of unequal exchange. Since they were unveiled, the Belt and Road Initiative (BRI) and the Chinese government's 2016 Arab Policy Paper have signaled the promise of a qualitative shift in China's engagement with the region. China has committed to increase investments in high-value-added sectors and to boost cooperation in science and technology with countries across North Africa.

The digital space is a notable aspect of recent China–North African partnerships. Chinese tech firms are becoming ever more important actors in North Africa through the Digital Silk Road, the digital component of the BRI. North African governments see the Digital Silk Road as an opportunity to help bridge the digital divide and bolster their own national efforts to build digital economies and create high-quality jobs for the millions of unemployed university graduates across the region. In recent years, the region has become home to notable Digital Silk Road projects such as smart cities, satellite navigation centers, data centers, and network infrastructure.

Huawei's localization strategies in Algeria and Egypt show that, far from imposing a one-size-fits-all blueprint on other countries, as Beijing is often depicted as doing in U.S. and European media and policy discussions, Chinese tech players adapt their engagement depending on local development agendas. Flexibility, customization, and services tailored to local demand have been cornerstones of Huawei's localization strategies in North Africa.

Accommodating local development priorities is central to Huawei's success in globalizing its business ventures. The Chinese firm has responded favorably to Algeria's and Egypt's attempts to leverage foreign companies for conducting more value-added activities within their respective economies. Among other things, Huawei opened its first African factory in Algeria, employing Algerians to assemble products for and beyond the Algerian market. It also launched an OpenLab for conducting research and development (R&D) activities in Egypt and established partnerships with several universities in the region to train local students.

However, closer scrutiny of Huawei's localization in both Algeria and Egypt indicates that the company improved its brand image without engaging in meaningful capacity building. For all its success at winning the hearts of government officials across the region, Huawei has engaged in training, manufacturing, and R&D in a way designed to maintain the firm's technological edge. The Chinese tech giant has managed to localize seemingly developmental activities in North Africa without contributing much to technological upgrading.

North African governments should take lessons from China's playbook of how it became a technological superpower. This means adopting policies that could maximize the benefits of Chinese and non-Chinese investments by ensuring positive spillovers and protecting potential local tech champions. Increasing economic integration across North African countries and moving beyond fragmented bilateral commercial negotiations with China are two steps that may help level the playing field with the Asian giant.

Introduction

China has rapidly expanded its global digital footprint. In the country's thriving domestic digital economy, Chinese information and communications technology (ICT) firms provide services to the highest number of internet users worldwide, estimated at around 1 billion people.¹ Since the turn of the century, these firms have also expanded their *global* presence, growing their market share in both construction and services, including by building the backbone infrastructure used by billions of internet users around the world.²

China has been an active player in North Africa since the 1950s, when the newly established People's Republic of China supported liberation movements across the region.³ Chinese ICT firms now stand on the cusp of becoming even more important actors through the Digital Silk Road, the digital component of the Belt and Road Initiative (BRI), Beijing's multibillion-dollar plan to enhance its connectivity and boost trade with partner countries and regions.

The Digital Silk Road entails bringing advanced digital infrastructure to BRI countries, including technologies like fiber-optic cables, data centers, 5G networks, e-commerce platforms, artificial intelligence and cloud computing services, and the digital architecture that powers and undergirds smart cities.⁴ The Digital Silk Road aims to build what Beijing calls "a community with a shared future in cyberspace."⁵ The announcement of this initiative in 2015 has led to a hodgepodge of follow-on government announcements, public and private funding vehicles, and various business deals.

Much of the policy debate about the internationalization of Chinese digital companies focuses on the potential risks of adopting Chinese technologies rather than on understanding why and how Chinese firms have succeeded in emerging markets in the first place. Many observers, particularly ones in the United States and Europe, presume that an all-powerful Chinese digital and ICT industrial complex smoothly grafts its uniquely "Chinese" internet model onto poorer nations and convinces them to

adopt it by financing such endeavors with Chinese loans.⁶ An emerging body of empirically grounded studies has deconstructed this narrative and pointed out how it marginalizes the local agency of China's partners.⁷ Far from imposing its own internet model on other developing countries, China instead seems to support nationally rooted visions of digital development.

This paper focuses on the Chinese tech champion Huawei's market entry and business strategies in Algeria and Egypt to show that accommodating local development priorities is central to the firm's success in globalizing its business. The Shenzhen-headquartered tech giant has responded favorably to Algeria's and Egypt's efforts to leverage foreign companies so as to help diversify and move to higher-productivity and technology-intensive economic activities. For example, Huawei opened its first African factory in Algeria, employing Algerians to assemble products for and beyond the Algerian market.⁸ Huawei also launched an OpenLab, with the aim of conducting research and development (R&D) in Egypt, and established partnerships with numerous universities in the region to train local students.⁹

To be sure, Huawei is not offering charitable development deals. The tech firm has set about dominating the Algerian and Egyptian ICT equipment manufacturing market by purposefully linking the growth of its operations to the developmental needs of these two host countries. This has allowed the firm to strengthen its political capital in both Algiers and Cairo and expand its market share in the two countries. Yet Huawei's localization in North Africa was not accompanied by meaningful opportunities for technological upgrading.

North Africa is an especially interesting case study of Chinese localization strategies. North African countries' relations with China are rooted in a shared history of suffering from colonial domination and strategic ties that go back to the rule of former Chinese leader Mao Zedong. More recently, the BRI has bolstered these ties because North Africa is a significant point of connection for maritime logistics between Africa, Asia, and Europe. Different North African countries have varying political economies, but they all share middle-income status. They also have in common growing numbers of tech-savvy young people, relatively high rates of internet and mobile penetration, and proximity to the European Union (EU)'s market.¹⁰ All of these factors have made North Africa a uniquely positioned strategic hub for the BRI and the Digital Silk Road.

Chinese policy documents explicitly acknowledge the importance of the region. For example, China's Thirteenth Five-Year Plan (2016–2020) states that Beijing aims to “develop an online Silk Road with the Arab countries and others” through high-speed fiber-optic networks.¹¹ In recent years, the region became host to several flagship Digital Silk Road infrastructure projects, including data centers and smart cities built by Chinese firms.

This paper draws on in-country interviews in Algeria and Egypt between September 2021 and February 2022. In both countries, interviewees included Huawei's Chinese and local employees, subcontractors, customers, students, ICT policymakers in the Algerian and Egyptian governments, other government officials in both countries, and experts and researchers. The paper showcases how Chinese digital firms operate on the ground, and it captures local perceptions of Huawei's localization strategy. It was not possible to access several relevant documents, which are not publicly disclosed for reasons ranging from commercial secrecy to national security, so primary interviews provided the backbone for the paper's empirical findings.

The paper is divided into four main parts and a conclusion. First, it offers an overview of China's economic relations with North Africa with an emphasis on the Digital Silk Road. Second, it turns to Huawei's path to internationalization. Third, it explores the various ways in which the company has accommodated partner countries' development impulses, local demands for job creation, training, and technological upgrading. The fourth section discusses and contrasts these findings with other studies in other developing countries. The paper concludes with some lessons for North African governments drawn from China's own experience promoting its tech champions and the promise of greater regional integration to better support local development needs.

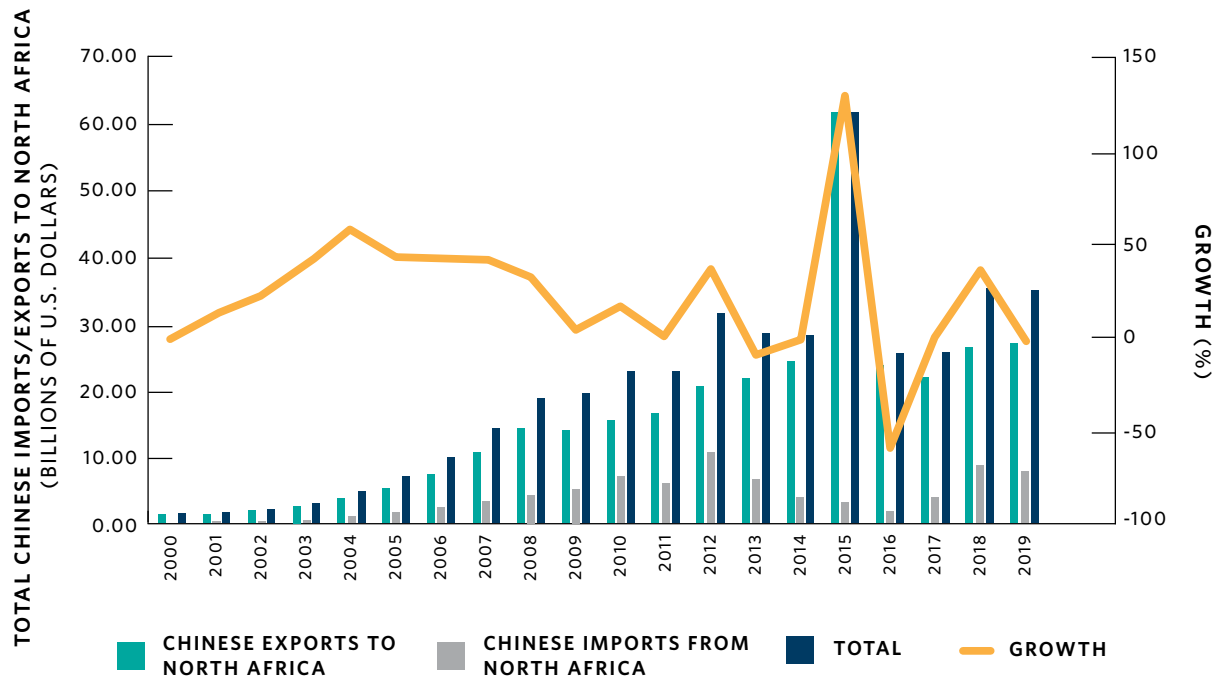
China's Economic Footprint in North Africa

Economic ties between China and North Africa can be traced to the days of the pharaohs. In the aftermath of independence from European powers in the 1950s and 1960s, four North African states—Algeria, Egypt, Morocco, and Tunisia—established diplomatic ties with China, whose Communist-led regime had actively backed liberation movements across the region.¹²

However, it was only in the early 2000s that trade between China and North Africa started to increase significantly, as China became a leading exporter to all North African countries.¹³ Between 2004 and 2014, trade volumes between China and the region grew by 20 percent annually on average, rising from \$4.9 billion to \$28.1 billion.¹⁴ As of 2020, total trade volumes hit \$33 billion,¹⁵ although the EU remained by far North Africa's largest trading partner, with total trade volumes surpassing \$124 billion the same year.¹⁶

The Arab Spring adversely affected Chinese–North African economic relations. Egyptian–Chinese trade experienced a downturn following the 2011 Egyptian revolution before rebounding in 2014 after the coup that brought President Abdel Fattah el-Sisi to power. Aside from the Arab Spring, the decline in global commodity prices after 2014 substantially reduced the total value of North

FIGURE 1
China-North Africa Trade



SOURCE: Compiled by the author using data from the China Africa Research Initiative. “China-Africa Trade,” JOHNS Hopkins University’s China Africa Research Initiative, 2020, <http://www.sais-cari.org/data-china-africa-trade>.

African exports to China. The region’s imports from China grew markedly in the 2010s, peaking in 2015, though the figures were still higher at the decade’s end than they were at the start (see figure 1).

While China’s trade relations with Gulf countries are characterized by a trade surplus in favor of Gulf states, North African countries all register significant trade deficits with China. In 2020, for example, Algeria imported around \$5.6 billion in goods from China, while its exports did not exceed \$1 billion.¹⁷ The same year Egypt imported over \$13.6 billion in goods from China but sold as little as \$905.9 million in return.¹⁸ This puts Egypt’s trade deficit with China at over \$12 billion for 2020 alone.

The composition of trade between China and North African countries also reproduces patterns of unequal exchange. Finished manufactured goods like automobiles, electronics, and garments make up the lion’s share of Chinese exports to North Africa.¹⁹ At the same time, oil, minerals, and unprocessed

agricultural products constitute the bulk of North African exports to China. Energy resources dominate Chinese imports from Algeria, Egypt, and Libya, and minerals and agricultural goods are the main exports that Morocco and Tunisia ship to China.²⁰ With the rising demand for foreign food in China, agricultural exports from North Africa have grown in importance in recent years. Notably, Egypt became China's top supplier of oranges in 2019.²¹

After Beijing formulated its “going out” strategy in the early 2000s, the presence of Chinese multinational corporations in North Africa increased gradually. However, China remains a relatively small investor in the region in comparative terms. In 2019, total Chinese foreign direct investment (FDI) stock in North Africa amounted to just \$3.5 billion, representing a bit less than 8 percent of total Chinese FDI stock in Africa and a negligible 0.15 percent of Chinese FDI stock worldwide.²²

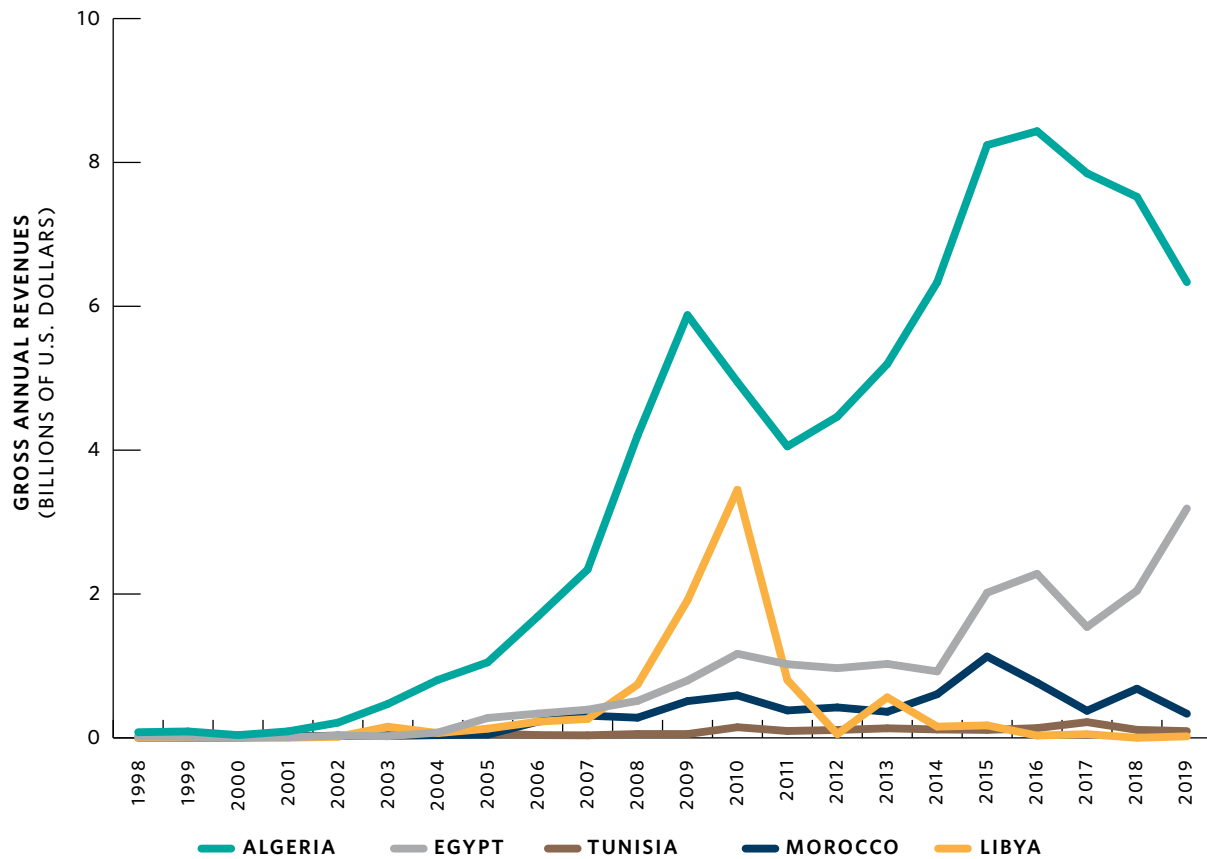
In spite of these statistics, China is often described as a major investor in North Africa. Major infrastructure projects such as Algeria's East-West Highway connecting Tunisia to Morocco, Algiers' new airport, and the new Great Mosque of Algiers are often considered Chinese investments. Yet these are, in fact, juicy turnkey contracts that the Algerian government has directed to Chinese construction firms, which tend to provide cheaper services than their Western competitors. Merely because Chinese firms are involved in building infrastructure does not mean that they are themselves investing in these projects.²³ Indeed, between 2009 and 2019, Algeria has become one of the most important markets in Africa for lucrative construction projects after granting an estimated \$70 billion in contracts to Chinese firms (see figure 2).²⁴ In any given year, capital inflows from Chinese FDI are much smaller than the outflows generated by turnkey contracts attributed to Chinese construction firms. For instance, in 2019 China's FDI stock in Algeria amounted to \$1.7 billion, while the value of contracts granted to Chinese firms in the country reached \$6.3 billion.²⁵

Since the launch of the BRI in 2013, Beijing has shown greater interest in North Africa, a development that has in turn signaled a qualitative shift in Beijing's bilateral relationships in the region. North Africa holds a *strategic* position in China's BRI because of its location, lying at the geographic crossroads connecting Asia, Africa, and Europe through Egypt's Suez Canal. All five North African countries have signed memorandums of understanding to join the BRI, and the region is home to several notable BRI projects.²⁶

China's 2016 Arab Policy Paper, issued by the Chinese Ministry of Foreign Affairs a few days before President Xi Jinping's tour of the region, announced a new era in the Asian giant's engagement with the region. The document emphasizes China's willingness to coordinate development strategies with Arab

FIGURE 2

Annual Revenues of Chinese Companies' Construction Projects in North Africa



SOURCE: Compiled by the author using data from the China Africa Research Initiative. "Chinese Contracts in Africa," Johns Hopkins University's China Africa Research Initiative, 2020, <http://www.sais-cari.org/data-chinese-contracts-in-africa>.

states according to *their* own needs and to promote cooperation in science and technology, research and education, and economic sectors such as telecommunications, renewable energy, and finance.²⁷

In particular, China's commitment to boosting technological cooperation with the region through the BRI has ushered in a new era of diplomatic ties. Beijing has shown more willingness to promote technology sharing by establishing a collaborative network of integrated technology transfers, encouraging exchanges between young scientific talent, creating joint research and scientific facilities, and encouraging Chinese technology firms to expand their business activities and establish local R&D centers in the region.²⁸

The Digital Silk Road and North Africa

The digital space is one of the most notable aspects of recent China–North African partnerships, not least because governments in the region are so eager to upgrade their backbone network infrastructure and accelerate the digitalization of their economies. The 2015 announcement of the Digital Silk Road; China’s “Internet Plus Strategy,” proposed by Premier Li Keqiang in his March 2015 Government Work Report, which aimed at linking China’s traditional industries to connected services; and the Chinese Foreign Ministry’s 2016 Arab Policy Paper have shaped China’s actions in North Africa.²⁹ The confluence of these three strategies led to a surge in new partnerships that paired North African governments and Chinese tech firms—from e-commerce giants to surveillance equipment providers.

As a result, North Africa has become home to several Digital Silk Road projects. For instance, in 2018, the China Satellite Navigation Office and the Arab Information and Communication Technology Organization launched the BeiDou Navigation Satellite System’s first facility abroad in Tunisia.³⁰ The center organizes joint research, testing activities, and workshops that emphasize the strengths of BeiDou and the Chinese products that tap into the system. It aims to provide training on satellite navigation to local scientists and spur growth in the digital economy across the broader region. Beijing also offers scholarships to students from North Africa who specialize in navigation systems.

Another flagship Digital Silk Road endeavor is the Tangier Tech City, a Chinese-built smart city in northern Morocco. Initially, this mega-project, signed in March 2017, was expected to create 100,000 jobs, provide housing for 300,000 people, and consolidate Morocco’s trade relationship with China.³¹ On completion, the city was set to constitute China’s most prominent industrial and technological hub in Africa, with around 200 Chinese companies specializing in high-value-added sectors such as aeronautics, automobiles, and ICT innovations.³² However, a dispute between the Chinese group Haite and Moroccan authorities over the “ownership of the city” led the Chinese constructor to leave the project in 2018.³³ Ultimately, the China Road and Bridge Corporation took over from Haite, but the project has been significantly downsized.³⁴

Led by Chinese tech giants, the Digital Silk Road offers digital infrastructure to middle-income countries at competitive prices.³⁵ Viewed through the lens of developing countries, the Digital Silk Road is an opportunity to bridge the digital divide and bolster indigenous efforts to build digital economies. North African economies are concentrated in low-value-added sectors and suffer from sluggish growth. High chronic youth unemployment, estimated at 30 percent as of 2017, is a distinctive feature of the Middle East and North Africa.³⁶ Remarkably, 40 percent of the region’s university graduates were unemployed, according to a 2017 report by the World Economic Forum.³⁷ More than a decade after the mass revolt against autocratic rule and lack of economic opportunities, no meaningful change has materialized in the region.

To generate long-term growth and create high-quality jobs for these millions of unemployed workers, North African economies need to undergo a structural transformation involving a transition from low-productivity, labor-intensive economic activities to high-productivity, technology-intensive activities that require great skill. Recognizing the potential of the digital economy to help this transition, governments across the region have adopted distinctive ICT strategies designed to boost internet connectivity, upgrade workers' skills, and build thriving knowledge economies.

Both Algeria and Egypt have unveiled national ICT strategies. Egypt's ICT 2030 plan prioritizes developing ICT infrastructure, fostering digital inclusion, building domestic capacity, and encouraging innovation.³⁸ Egypt has positioned itself as a regional leader in exporting information technology services and is home to a vibrant start-up scene. In 2017, Egypt passed an investment law that promotes inbound FDI by easing barriers to entry and supporting foreign multinational firms' localization efforts.³⁹ Although Algeria was slower to start its digital transformation, it has made significant strides in terms of ICT infrastructure, with bandwidth capacity increasing more than twenty times since 2014.⁴⁰ Through the creation of the Ministry of Microenterprise, Knowledge Economy, and Startups in 2020, the government is attempting to shift Algeria's hydrocarbon-dependent economy to a new knowledge-based model.

As governments across North Africa adopt digital transformation agendas, Chinese firms have formulated strategies to closely align with them. Huawei has made significant inroads in the region's telecommunications industry due to its capacity to provide high-quality network equipment at relatively affordable prices. In addition, Huawei has been training local employees, subcontractors, and students to an unmatched level compared with other major global ICT original equipment manufacturers (OEMs) like Cisco, Ericsson, Nokia, and the Chinese partially state-owned firm ZTE.⁴¹ Furthermore, Huawei has localized some high-value-added activities in North Africa, including by opening manufacturing plants and conducting R&D.

How Huawei Went Global

Founded in Shenzhen in 1987 by Ren Zhengfei, who used to serve in the People's Liberation Army, Huawei has grown exponentially since its modest beginnings reselling private branch exchange switches imported from Hong Kong.⁴² Huawei became the world's leading OEM by moving into new markets as it began constructing telecommunications networks for phone carriers, making mobile devices for consumers, and providing a myriad of cloud, big data, and other services to other firms. In 2020, Huawei had more than 197,000 employees, operated in 170 countries and regions, and estimated that its equipment served over 3 billion people worldwide.⁴³

Huawei's push to become a more international company is closely tied to China's economic reforms. In the late 1990s, China embarked on a new stage of integration into the global economy, expanding from attracting inbound FDI to "going out" by encouraging its own enterprises to venture overseas. A decade earlier, China's policy of opening its market to overseas firms had resulted in foreign dominance of several industries and market saturation.⁴⁴ In part, it was Huawei's desire to escape fierce competition at home that drove it to seek new markets abroad.⁴⁵

Huawei's push to internationalize its operations started by expanding into low- and middle-income economies before seeking to enter high-income markets.⁴⁶ This approach mirrors the company's domestic expansion strategy within China of "using the countryside to surround the cities."⁴⁷ The rising demand from developing countries to expand their network capacities (in terms of geographic coverage and the number of users, for instance) and upgrade network equipment (shifting from 3G to 4G and eventually to 5G), combined with the competitive prices of Huawei's products, meant that the firm soon began generating more of its revenue from outside China than domestically (see table 1).⁴⁸ In 2012, Huawei overtook the Swedish-headquartered company Ericsson in revenue to become the world's largest telecommunications equipment vendor.⁴⁹

Huawei's spectacular internationalization, including in North Africa, can be attributed to several factors. First, the Shenzhen-based firm produces high-quality equipment that is cheaper than its competitors' wares. Some analysts have estimated that Huawei's equipment is about 30 percent cheaper than that of its competitors, but estimations vary widely depending on the type of technology.⁵⁰ Huawei's remarkable push to internationalize, including its price advantage, can be traced to the financial edge it derives from the Chinese state and the company's commitment to R&D. Huawei and other Chinese tech firms venturing abroad benefit from access to large loans provided by China's state-backed policy banks, specifically the China Development Bank (CDB) and the Export-Import Bank of China (or China Exim Bank). For instance, Huawei received one CDB loan to the tune of \$10 billion in 2004 and then received another for twice that amount in 2009.⁵¹ Credit from the CDB allowed Huawei to offer what is termed vendor financing, which is providing the financial backing for customers to make major purchases.⁵²

Loans from the CDB and the China Exim Bank were a huge boon for Huawei. With such financial backing, the firm could provide more favorable financing terms to customers than its Western competitors. As one employee of the French-American telecommunications firm Alcatel-Lucent put it, "We won't die at the hands of Huawei; if we die, it will be at the hands of China Development Bank."⁵³ In Africa alone, the China-Africa Research Initiative of Johns Hopkins University's School of Advanced International Studies identified more than seventy loan-backed projects by Chinese financiers between 2000 and 2019 involving Huawei contracts.⁵⁴

TABLE 1

Huawei's Overseas Revenue

Year	Total Revenue (Billions of Yuan)	% of Revenue From Overseas Sales
2002	18	N/A
2003	22	27.4
2004	31	40.9
2005	48	58
2006	66.7	65
2007	94	72
2008	125.2	75
2009	149	60.4
2010	185	66
2011	204	67.8
2012	220	66.6
2013	239	64.8
2014	288.2	62.2
2015	395	45.7
2016	521.6	59
2017	603.6	71
2018	721.2	48.4
2019	858.8	41
2020	891.4	34.4

SOURCE: Compiled by the author based on figures from Huawei's annual reports. See, for example, Huawei, "2020 Annual Report," Huawei, 2021, <https://www.huawei.com/en/annual-report/2020>.

Second, considerable investments in R&D are a cornerstone of Huawei's global success. The Chinese firm reinvests a far greater share of its profits back into production and R&D compared to U.S. firms like Cisco, which have grown increasingly financialized.⁵⁵ This has been especially the case since the 2000s, when Beijing adopted a handful of policies to boost "indigenous innovation" in strategic

areas.⁵⁶ These policies reflected concerns in the Chinese Communist Party's leadership that its low-value-added export path in the 1980s risked leaving China stuck indefinitely at the bottom of global value chains and vulnerable to the national security implications of foreign-controlled internet infrastructure.⁵⁷ In response, new Chinese policies aimed squarely to support the emergence of competitive domestic actors by offering a wide range of incentives for local firms, both public and private, to enter the digital innovation fray. In this context, Huawei progressively ramped up its own R&D efforts and set out to overtake its global competitors.

Huawei's R&D strategy has also evolved by virtue of its experience competing on the global stage. One turning point was a 2003 lawsuit Huawei faced when Cisco accused it of "systematic and wholesale infringement of Cisco's intellectual property."⁵⁸ The lawsuit was settled in 2004 after Huawei agreed to modify its telecommunications equipment, among other steps. Following the lawsuit, Huawei adopted a more strategic approach to R&D and strove to boost its patents. The firm started spending an increasing share of its revenue on R&D and systematically patenting its innovations.⁵⁹ For years, Huawei has poured a tenth or more of its annual revenues into R&D. In 2020 alone, its R&D spending reached a staggering 141.9 billion yuan (around \$22.3 billion).⁶⁰ Despite U.S. pressure under former president Donald Trump's administration, Huawei increased its active patents by at least 17 percent to a total of more than 100,000 between the end of 2019 and the end of 2020.⁶¹ As one of the firm's executives boasted, Huawei has grown to become "one of the world's largest patent holders."⁶²

Finally, a less-recognized factor behind Huawei's success lies in the firm's capacity to adjust to disparate cultural, political, economic, and institutional settings in different regions around the world. The tech giant has flourished in widely varying environments, from democratic Senegal to autocratic Cuba, from the United Kingdom's (UK) liberalized telecommunications industry to Ethiopia's state monopoly over telecommunications, and from the stable and prosperous EU to war-torn Afghanistan. Admittedly, Huawei's operating environment in some of these locations is changing, with the UK government barring the firm from its 5G rollout. Nonetheless, these setbacks reflect geopolitical misgivings more than shortcomings in the firm's technological and business capabilities.

Huawei's bid to internationalize its operations has involved learning and making adjustments. Gaining local knowledge allowed the tech multinational to fine-tune its products on short notice to meet local customers' evolving needs.⁶³ For instance, attempting to capture more market share in the smartphone sector in Muslim-majority countries, one of Huawei's popular smartphones came with a built-in Muslim prayer reminder function and an app for locating nearby mosques.⁶⁴ In developing countries where the need for job creation, training, and technological upgrading is pressing, Huawei has emphasized knowledge transfer schemes by creating ICT academies, organizing tech competitions, and providing scholarships to outstanding students.

Huawei's Localization in North Africa

Just a few hours after landing in Egypt in 2009, then Chinese premier Wen Jiabao visited Huawei's training center in Cairo.⁶⁵ Huawei had chosen the city as home to its second training center on the African continent in 2005 with an initial investment of \$20 million. The company followed this move with an upgrade four years later, which involved moving the center to Cairo's Smart Village, a cluster of all the relevant major ICT firms, universities, and public agencies. With North African countries striving to diversify their economies and move up industrial value chains, Huawei's public relations team has put considerable emphasis on the firm's role in contributing to the region's digital transformation. Huawei collaborates closely with the Algerian and Egyptian governments on training programs, manufacturing ventures, and R&D initiatives. The firm's foray into international competition has depended on its ability to adjust national development priorities and gain political capital with both government officials and ordinary people to advance its business interests.

The Algerian and Egyptian governments are devoting considerable resources to improving network equipment and encouraging the launch of new digital ventures.⁶⁶ Egypt has witnessed an upsurge in internet penetration rates. Egypt's rate was 57.3 percent as of January 2021, while Algeria's rate reached about 60 percent by then.⁶⁷ This growth in mobile broadband access is somewhat correlated with a surge in mobile phone subscriptions and an expansion in 3G and 4G network coverage. This progress shows up in the countries' mobile penetration rates, which gauge the share of people who own a mobile phone. For Egypt, this metric stood at 92.7 percent in January 2021: the country's three main mobile service operators are Etisalat, Orange, and Vodafone.⁶⁸ In Algeria, which also boasts three main mobile service providers including Djezzy, Mobilis, and Ooredoo, the mobile penetration rate reached 105.8 percent in January 2021.⁶⁹

These numbers indicate substantial growth, yet in comparative terms the region's internet penetration remains just slightly above the world average, which is estimated to be 57 percent.⁷⁰ This means that these countries still present significant growth opportunities. Other than sub-Saharan Africa, no region in the world has more room to improve its penetration of mobile services than the Middle East and North Africa.⁷¹ According to a report by a trade association for the mobile network industry, Middle Eastern and North African countries are likely to see subscriber numbers climb at a higher clip from 2017 to 2025 than any region besides sub-Saharan Africa.⁷² There will be a great deal of growth potential as 5G technologies are introduced. In Egypt, the National Telecom Regulatory Authority has started to allocate new frequencies to mobile operators, but in Algeria, the shift toward 5G has been slower.⁷³ Huawei has arguably become the top network equipment provider in Egypt and Algeria alike.⁷⁴ Measured by the size of its population, Egypt is the largest market in the

Middle East or North Africa and the third-largest market in all of Africa.⁷⁵ Egypt also was selected by Huawei to be home to its North African headquarters in Cairo in 1999.⁷⁶ The company entered the Algerian market the same year by establishing a subsidiary called Huawei Telecom Algeria. Huawei employs an estimated 1,000 workers in Egypt and about half as many in Algeria, with about 70 percent of the staff made up of local employees and the remaining 30 percent consisting of Chinese and other foreign engineers.⁷⁷

Because Huawei Algeria and Huawei Egypt are subsidiaries of the parent company, they do not have to publicly release financial data. Nonetheless, as Ran Li and Kee-Cheok Cheong have noted, their “performance can be inferred directly from periodic announcements the company issues and indirectly from viewing financial data . . . from the parent company’s annual reports.”⁷⁸ Both the Algerian and Egyptian governments have granted major contracts to Huawei as part of their efforts to catch up in terms of building out their network infrastructure, e-governance platforms, and cloud data centers.

For instance, Huawei’s enterprise business signed, among other things, a contract with Sonatrach, Algeria’s state-owned oil company, to upgrade its digital systems by providing cloud services and big data applications.⁷⁹ In Egypt, the state-owned Telecom Egypt (We) and Huawei inked a \$200 million deal in 2018 with backing from Chinese financiers to support Telecom Egypt’s 4G network development.⁸⁰ In both countries, Huawei has played a key role in the upgrading of 3G and 4G networks and will likely continue to do so with 5G, despite mounting pressures from the United States to ban the Chinese equipment manufacturer.⁸¹

Concurrently, Huawei has partnered with several local universities, research institutes, and firms to expand its footprint. The firm has built an image as a key development partner in the ICT sector, projecting its willingness to adjust to, and accommodate, local development needs. Relevant activities include providing various training programs in both Algeria and Egypt, opening a manufacturing plant abroad in Algeria, and establishing one of its few overseas OpenLabs in Egypt.

Localization Through Training in Algeria and Egypt

Interviewees in Algeria and Egypt referred to the central role that training plays in Huawei’s localization strategy. Similar to workers at its competitors, new Egyptian and Algerian employees at Huawei go through training programs when they are first hired.⁸² This training continues throughout their employment period, with mandatory tests undertaken at different stages of their careers. Huawei, like others, offers training to local subcontractors for installing, troubleshooting, and maintaining the equipment they sell to customers. Typically, OEMs utilize different subcontractors covering the various regions of a country where ICT infrastructure is being rolled out. They also provide training to customers on the use of purchased equipment.

But, unlike for other firms, Huawei's enterprise business has been notably active in establishing cooperation agreements with local universities and in training students across North Africa. Huawei has forged two types of partnerships with North African universities: the Huawei Authorized Network Academy and the Huawei Authorized Information and Network Academy, both of which also operate in other regions. According to Huawei, the objective of these academies is to build capacity and help local economies spur digital transformation by connecting local talent to the ICT industry.⁸³ Specifically, these academies aim to promote certifications in Huawei technologies among local university students in ICT-related subjects. These certifications attest that their holders are competent in using and maintaining the technologies of a specific manufacturer. Students then go on to find employment with mobile operators, equipment manufacturers, or other firms that use these technologies. Alternatively, some graduates join channel partners who sell and install equipment for customers such as governments and large corporations.⁸⁴

In Algeria, Huawei has ramped up efforts to create ICT academies across the country in recent years. Through a partnership signed in 2021 with the Algerian Ministry of Higher Education and Scientific Research, Huawei launched multiple major local ICT labs within leading Algerian universities including the National Institute of Telecommunications and Information and Communication Technologies (in Algiers and Oran), the University of Saida, the University of Sciences and Technology Houari Boumediene (in Algiers), and the National School of Computer Science (in Algiers).⁸⁵ These labs are equipped with high-performing computers and cutting-edge equipment for training students. Participating universities also have access to ICT courses taught by accredited Huawei instructors who train both students and future instructors. According to Huawei, it trains more than 3,000 young Algerians annually in various ICT-related fields.⁸⁶

Likewise, in Egypt, Huawei launched ICT academies in 2013 to develop university infrastructure, train young Egyptian ICT talent, and increase employment opportunities for university graduates by facilitating university-industry linkages. In 2019, the firm signed a partnership with Egypt's Ministry of Communications and Information Technology, Ministry of Manpower, and Ministry of Higher Education and Scientific Research to launch a local ICT Talent Bank, its flagship capacity-building program.⁸⁷ The program is meant to create 100 Huawei academies in Egypt, train 200 instructors and 1,200 ICT engineers, and certify 4,000 people.⁸⁸ Trainees are selected on a competitive basis from a dozen Egyptian universities, including Assiut University, Aswan University, and Suez University. According to Sun Luocheng, the chief executive officer of Huawei Egypt, the ICT Talent Bank aims to be a bridge connecting all players in Egypt's digital ecosystem in response to Cairo's push to promote a local knowledge economy as envisioned in the Egyptian government's ICT 2030 agenda.⁸⁹

To be sure, Huawei's ICT academies primarily aim to outcompete other multinational players. Historically, the ICT sector has been dominated by Cisco certifications, which many ICT engineers consider the golden standard.⁹⁰ Huawei has been actively trying to erode Cisco's dominance of the certification market.⁹¹ Through its locally established ICT academies, the firm has created several incentives to boost the rate of students certified in Huawei technologies, not least by gifting pricey simulation equipment to local universities that succeed in achieving a substantial number of Huawei-certified students per year and by providing discounts on its certification fees, which the firm pays on behalf of students with vouchers. According to interviews with several engineers in Algeria and Egypt, fees for Cisco certifications run \$200 to \$600 compared to \$100 to \$500 for Huawei certifications.⁹² During the coronavirus pandemic, interviewees said that Huawei went as far as scraping all fees for anyone wishing to be certified by Huawei, while Cisco introduced a 50 percent discount.⁹³ With the cost-free option now available, many Algerian and Egyptian students interviewed by the author opted for Huawei's certifications instead of Cisco's.

Additionally, Huawei has launched a Seeds for Future scholarship, which takes some of the brightest students from all over the world to Huawei's headquarters in Shenzhen and offers them exposure to new technologies and immersion in Chinese culture. Huawei also organizes large-scale ICT competitions, including within and among North African countries. Algerian and Egyptian teams were among the winners of the global final of the 2019–2020 Huawei ICT competition.⁹⁴

Huawei also works at building ties with channel partners that use Cisco equipment to incentivize them by reducing the cost of the training and certifications in Huawei's technologies.⁹⁵ This strategy has worked at promoting deeper Huawei penetration: in interviews, a few channel partners explained that they were previously selling Cisco technologies but that the market in Cisco equipment was saturated, so when Huawei offered them the opportunity to become their channel partners, they seized it.⁹⁶

With more ICT engineers now trained to install, maintain, and troubleshoot Huawei technologies, and with more channel partners selling Huawei products, North African governments, operators, and firms now have yet another incentive to increase purchases of Huawei's more affordably and attractively financed equipment.

Huawei's Manufacturing Plant in Algiers

One of the most significant Digital Silk Road projects and compelling illustrations of Huawei's localization strategy in North Africa is the firm's smartphone factory in Algeria. Launched in 2019, this factory is the first of its kind in Africa and one of the few facilities worldwide located outside China itself. The plant is the result of a partnership between Huawei and an Algerian company called AFGO-Tech. The factory originally could crank out 15,000 mobile devices per month, though it later reportedly expanded its operations to produce 30,000 devices per month, according to an interview with an assembly line manager.⁹⁷ The production unit employs around 140 Algerians, including twelve engineers trained in Shenzhen in Huawei's production techniques and procedures.⁹⁸

The decision to set up a factory in Algiers came after lengthy negotiations between Huawei and the Algerian government. Algeria, whose state coffers depend greatly on hydrocarbon exports, was hit hard by the 2014 crash in commodity prices.⁹⁹ This led the government to reduce imports and adopt an import-substitution strategy to save foreign currency. In 2018, the Algerian government banned the import of 900 products, including cell phones.¹⁰⁰ In its quest to diversify its national economy and increase local production of value-added goods, the government introduced a series of new industrial policies. Most notably, the Algerian government engaged in negotiations with several cell phone manufacturers to localize production. The South Korean firm Samsung was the first to respond to this call. Samsung announced the launch of its first smartphone assembly plant in the country in December 2017 through its Algerian subsidiary Samsung Algeria and its local distribution partner Timecom. Samsung's Algerian factory has a production capacity of 1.5 million units per year and is estimated to create 400 direct jobs and hundreds of other indirect ones.¹⁰¹

This implicit Algerian government pressure worked: fearing the loss of market share to Samsung, Huawei responded to the government's call to localize production. It announced that it would open its first African factory in Algiers in January 2019.¹⁰² At the factory's launch ceremony, Huawei representatives stressed that the plant, situated in Oued Smar, an emerging industrial hub in the eastern outskirts of Algiers, would be equipped with advanced technologies and, most importantly, that it would involve the transfer to Algeria of cutting-edge technologies and manufacturing processes. During its first months of operation, Algerian employees were put under the supervision of Chinese experts dispatched from the firm's various factories to guarantee compliance with Huawei's standards. The plant started by assembling a single model, the Y7 Prime smartphone, the product that Huawei judged to be best suited to consumer preferences in the Algerian market.¹⁰³

Like other Huawei plants, the Oued Smar factory plays a strategic role in the company's internationalization. It ensures continuous access to Algeria's promising consumer market of 43.9 million through a localized supply chain that combines Chinese inputs into the assembly of the final product in Algeria.¹⁰⁴ In December 2018, prior to the factory's launch, Huawei's market share in Algeria's phone market was only about 6 percent. By August 2020, it had doubled to peak at 12.3 percent (though it has since slightly declined), outcompeting Condor, a homegrown Algerian cell phone brand.¹⁰⁵

From the Algerian side, concerns remain over the factory's low rate of integration of locally produced components. Interviewed experts expressed doubts that the assembly line's reliance on imported semi-knocked-down (SKD) and completely-knocked-down (CKD) kits that are manufactured in China and then exported to Algeria for the final stages of assembly would generate meaningful know-how in value-added manufacturing.¹⁰⁶ Algerian authorities described the issue as "fictitious production" and "disguised import."¹⁰⁷ In January 2021, the factory's activities were suspended due to the government's ban on the import of CKD and SKD kits, and its workers, who were employed on AFGO-Tech contracts, were laid off for an undetermined period.¹⁰⁸

Huawei's OpenLab in Cairo

Another of the firm's flagship ICT ventures in North Africa is its OpenLab in Cairo. Launched in 2017, the lab was, at the time, one of just eight worldwide and only the second in Africa, following the opening of a similar facility in Johannesburg.¹⁰⁹ Through this lab, Huawei targets enterprise customers and aims to offer a platform for innovation in collaboration with local partners. Situated in the Smart Village office complex in Cairo and covering an area of 400 square meters, this OpenLab serves as a market-oriented R&D facility.¹¹⁰

The OpenLab in Cairo aims to create synergies between customers and an alliance of local industry partners to develop new applications and services for the Egyptian and North African markets. It also reflects Huawei's ambitions to enhance its understanding of the local characteristics of the North African market, a necessary step to create software and applications that fit local needs. The OpenLab operates in coordination with four existing Huawei centers in Cairo.¹¹¹

The OpenLab was announced a few months after the Egyptian government put forward its ambitious ICT 2030 vision, with the goal of ushering in a new era in the country's transition to a digital economy. The vision emphasizes Egypt's aim to "build and foster an ecosystem that encourages entrepreneurship and spurs creativity."¹¹² It also endeavors "to promote research and development, innovation, and entrepreneurship in the field of ICT in order to drive sector growth . . . and position Egypt as a regional innovation hub."¹¹³

The choice of Egypt as the location for Huawei's second OpenLab in Africa was a response to two central goals of Cairo's digital industrial policy: the development of local content in Egypt in key ICT applications and the promotion of an export-oriented Egyptian ICT sector, notably in terms of ICT-enabled services.¹¹⁴ Egypt was able to leverage the strengths of its sizable population of over 100 million and its regionally well-ranked higher education system, two local advantages that Huawei executives have specifically highlighted as factors in the company's decisionmaking process on the Cairo facility.¹¹⁵

But despite much fanfare, the lab is by no means equivalent to one of Huawei's fully fledged domestic R&D centers, where the firm's most innovative research is conducted. According to an official Huawei statement, the Cairo lab focuses on nontechnological R&D—in other words, looking at developing applications in the areas of public safety, smart city management, smart government, and smart education.¹¹⁶ There appear to be no plans for the center to focus on technology-centered R&D, such as artificial intelligence-enabled applications, the Internet of Things, sensors, and other high-tech applications. While Huawei has established R&D facilities in more advanced economies, including one launched in France in 2020, the firm has not yet included African countries in such specialized cooperative ventures.¹¹⁷

In this way, Huawei *has* localized in Egypt, but it has done so within a global framework that has so far kept its advanced R&D work in China and countries with stringent intellectual property regulations. As a profit-seeking entity, the Chinese firm has no incentive to share its cutting-edge innovations in ways that would weaken its technological, and hence commercial, advantage.¹¹⁸ Thus, in its training, manufacturing, and R&D activities in both Egypt and Algeria, Huawei's localization strategy has focused on an appealing public relations campaign emphasizing the firm's support of national development priorities while relying on technological retention so as to ensure its continued dominance over the North African market.

Localization Through Accommodation

Huawei's strategies and approaches in North Africa show that, far from imposing a one-size-fits-all blueprint on other countries, Chinese tech players do adapt and adjust their engagement strategies depending on local development agendas. Flexibility, customization, and services tailored to local demand have been a cornerstone of Huawei's localization strategies.

Large-scale training, corporate social responsibility activities, and, more recently, localized manufacturing and R&D have been essential to Huawei's considerable commercial dynamism in North Africa. This localization strategy enabled Huawei to build strong ties with a myriad of actors in

Egypt's and Algeria's ICT ecosystems, while portraying itself as an active partner of the two governments' transitions toward digital economies. Huawei's embeddedness in North Africa helped it to work smoothly with policymakers and powerholders, something that would not have been possible without responding to the localization initiatives the two governments pressed on it.

An important question both governments need to ask is the true extent to which Huawei is contributing to Algerian and Egyptian technological upgrading. In an empirical study of Huawei's role in human capital development in Nigeria, Motolani Agbebi found that the Chinese firm's training efforts *have* helped upskill local employees, suppliers, and customers, while the company has also organized ICT competitions and provided scholarships to local students.¹¹⁹ By contrast, Henry Tugendhat found in another study that looked at Huawei's training centers in Nigeria and Kenya that Huawei's presence fell short of featuring tangible enough knowledge transfers and technological upgrading. He argued that international equipment vendors, including Huawei, limit *by design* the scope of the knowledge they are willing to share with local employees and actors.¹²⁰

For all of Algeria's and Egypt's ambitions, this study's findings in *both* cases corroborate this latter insight. Huawei's localization of training to its Algerian and Egyptian subcontractors could in theory generate significant knowledge spillovers, but Algerian subcontractors revealed to the author in interviews that training was limited to the installation and maintenance of Huawei products.¹²¹ The purpose of the training was simply to ensure smooth operations on Huawei's equipment. Likewise, the firm's employees in both Egypt and Algeria reported that training focused on mastering Huawei products and services and that high-level positions within the firm remained off-limits to locals. Even in the manufacturing and R&D spheres, Huawei did respond to the government's calls for localizing high-value-added activities but kept a tight rein on its intellectual property.

The long-term effects of Chinese digital projects in North Africa will depend on several factors, including the degree to which Algiers and Cairo foster more institutional capacity, grow their consumer markets through other macroeconomic and microeconomic policies, and promote human capital development. Ultimately, China's digital presence in North Africa operates within the context of local institutions and infrastructures, preexisting ecosystems, and local social preferences.

Conclusion

The BRI and the Digital Silk Road have led to a deepening of relationships between China and North African countries, with increased Chinese projects in local manufacturing and the tech sector. The entry of leading tech firms into North Africa, including major Chinese firms, has prompted lofty expectations among governments across the region seeking to foster booming digital economies.¹²²

However, although the Digital Silk Road meets the demands of North African governments for infrastructure expansion and skills upgrading, local policymakers should scrutinize the degree to which the much-advertised development initiatives by Chinese firms ultimately meet local aspirations and expectations. Above all, the governments need to press for meaningful technology transfer, since Chinese and other foreign players will invariably try to preserve their proprietary knowledge and technological edge.

This is especially important because Chinese firms now have a commanding position in the North African ICT scene, making it harder for domestic competitors to make inroads.¹²³ For instance, Algeria's local champion firm, Condor, lost some of its market share in mobile phones to Huawei after the launch of the Chinese firm's local assembly plant. Localization by Chinese players has brought mixed results for North African governments—it promotes local employment and training to some extent but comes at the expense of local firms hoping to find their own opportunities to grow. That is not all: when Chinese tech players build local digital infrastructure, they retain control of lucrative digital data. With access to such information, Chinese digital giants can further deepen their understanding of local markets and more effectively hold domestic North African players at bay.

For North African decisionmakers to succeed in fostering thriving digital economies that would help their citizens find jobs and improve their standards of living, they must learn from China's example by ensuring that their own potential tech champions have sufficient financial resources and buffers from fierce competition to succeed.¹²⁴

One way for North African states to maximize the economic gains from Chinese investments is through greater regional cooperation. By promoting regional integration, Algeria, Egypt, and their neighbors can increase their bargaining power with Chinese multinational firms. Moving beyond fragmented bilateral commercial negotiations with China would help level the playing field for all North African governments as they deal with Huawei and other companies whose investments and know-how they hope to attract and harness.

About the Author

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