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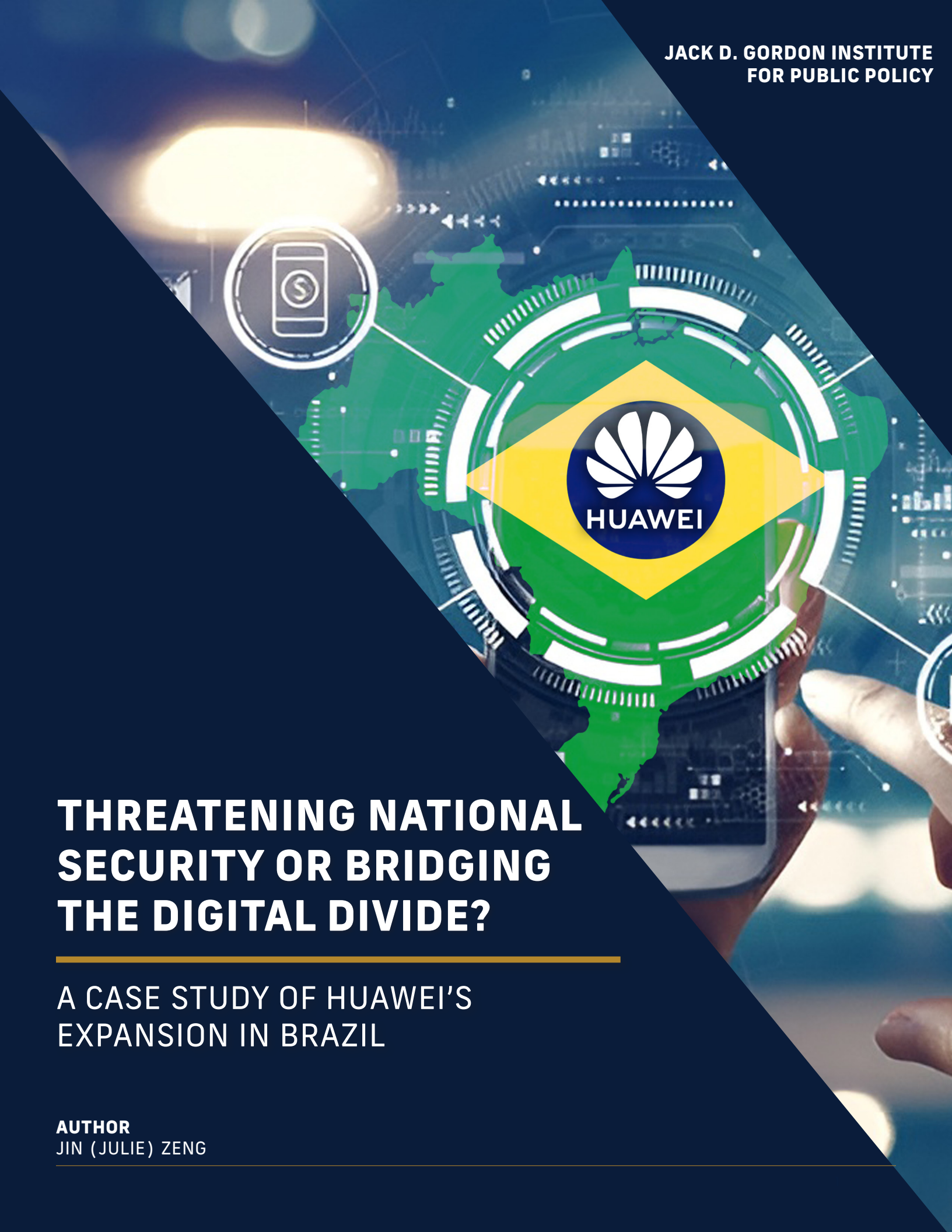

THREATENING NATIONAL SECURITY OR BRIDGING THE DIGITAL DIVIDE?

A CASE STUDY OF HUAWEI'S EXPANSION IN BRAZIL

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EXECUTIVE SUMMARY

China's digital footprint has expanded rapidly in Latin America over the last two decades. Neither the U.S.-China tech war nor the U.S.-led global campaign aimed at Chinese tech firms seemed able to reverse the trend. Much of the policy discussion in the Western media surrounding China's digital expansion focuses on the supply side, emphasizing the potential risks of adopting Chinese technology. Yet, there remains scant research on the demand side—namely, how policymakers in developing countries perceive Chinese tech firms and how they maneuver amid the intensifying rivalry between the United States and China. How did Chinese tech firms become key telecommunication equipment providers for Latin America despite geopolitical headwinds? To shed light on the issue, this paper examines local stakeholders' perceptions of Chinese tech firms and their choices between development and national security. Employing a case study of Huawei's expansion in Brazil, the paper argues that the lack of political consensus on banning Huawei, the prohibitive costs of replacing Huawei, Brazil's priority of development over security concerns, and China's vaccine diplomacy enabled the Chinese tech giant to gain a firm foothold in Brazil. Instead of perceiving Chinese technology as a security threat, major Brazilian regulators and internet service providers consider Huawei an opportunity for them to bridge the digital divide.

To counter the global expansion of Chinese economic and political influence, U.S. policymakers should first shift their focus from the securitization discourse surrounding Chinese technology to development issues confronting developing countries. U.S. policymakers should situate themselves in the Latin American context and view China's tech firms from the perspective of their regional counterparts. Second, U.S. policymakers should provide a feasible alternative to Chinese technology by redirecting resources to the research and development of Open RAN (radio access network) and enabling the mass production of its subcomponents at a lower cost. Third, U.S. policymakers should build a multilevel alliance with political and business elites at various levels in developing countries. U.S. diplomacy must shift its focus from the federal to the local and sectoral levels. Fourth, U.S. policymakers need to expand the emphasis beyond technology and devise a comprehensive and nuanced strategy, including trade, foreign direct investment, foreign aid, as well as cooperation in education, health, energy transition, and climate change. Mutual benefits from bilateral cooperation in a wide array of fields will help strengthen U.S.-Brazilian ties.

INTRODUCTION

The scale and speed of China's technological advances in recent years have raised concerns in Washington over their implications for America's dominance in technology and its overall competitiveness. Many Chinese tech firms, previously unknown to the outside world, have rapidly become top contenders in their respective fields. They have expanded into the global market, gaining an edge in regions where U.S. and European companies had long held prestige. For example, DiDi controls nearly 60 percent of the ride-hailing market in Mexico.[2] Kuaishou and TikTok are two Chinese short-video platforms that gained global popularity shortly after their launches in the mid-2010s. ZTE is a global leader in telecommunications. Oppo, Xiaomi, and Vivo are top sellers of mobile phones in some Latin American countries.[3] The list goes on.

The stunning rise of China's Huawei Technologies Co. is probably the most conspicuous example. In just over three decades, Huawei has grown from a small electronics reseller in 1987 into the world's top provider of telecom equipment with over US$92 billion in revenue and 207,000 global employees in 2022.[4] It has leading positions in smartphones, chip design, telecom equipment, 5G technology, artificial intelligence, smart cities, and cloud computing. Its global operations span from Asia and Europe to Africa and Latin America.

As China's Digital Silk Road expanded globally, the U.S. government increasingly worried that Beijing might use telecommunications equipment from Chinese tech firms to spy and

pilfer data. Designating Huawei as a national security risk, the Trump administration imposed a series of sanctions on it and led a global campaign to remove Huawei from the telecom networks of the United States and other countries. However, the U.S.-led campaign against Huawei has only achieved limited success. Most developing countries, including those in Latin America and the Caribbean (LAC), are increasingly employing it.[5] In its 2022 Annual Report, Huawei prided itself on providing products and services to over three billion people in more than 170 countries.[6]

Huawei's rapid expansion in LAC is particularly alarming to policymakers in Washington, D.C. Twenty years ago, Huawei's presence in LAC was obscure and insignificant, but today, it is a key telecommunications equipment provider for the digital infrastructure in the region. Huawei is also at the forefront of next-generation technology, such as 5G, which Latin American countries crave. Despite repeated warnings from U.S. officials about security risks associated with Huawei equipment, few LAC countries (except Costa Rica) have banned or implemented any sort of restrictions on Huawei.[7] Instead, the China-CELAC 2022-2024 plan explicitly prioritizes China's engagement with the region in a broad range of digital sectors, including digital infrastructure, telecommunications equipment, 5G, cloud computing, the Internet of Things, and smart cities.[8] Huawei has won customers in much of Latin America, built data centers in Chile, deployed a "safe cities" security camera and control system in Panama, and launched a two-year "5G city" pilot project in Brazil, to name a few.[9]

Why has Huawei become LAC's key telecommunication equipment provider despite geopolitical headwinds? Why didn't those countries follow the United States's lead to ban Huawei? Much of the policy discussion in the Western media surrounding China's digital expansion focuses on the supply side, emphasizing the potential risks of adopting Chinese technologies. Yet there remains scant research on the demand side—namely, how policymakers in developing countries perceive Chinese tech firms and how they navigate amid the intensifying rivalry between the United States and China. To explore these issues, this paper places local stakeholders (state agencies, key policymakers, local officials, and internet service providers) front and center in the analysis by examining their perceptions of the benefits and risks of using Chinese technologies and their choices between development and national security.

Employing a case study of Huawei's expansion in Brazil, the paper argues the prohibitive costs of replacing Huawei, the lack of political consensus on banning Huawei, Brazil's priority of development over security concerns, and China's vaccine diplomacy enabled the Chinese tech giant to gain a firm foothold in Brazil. Instead of perceiving Chinese technology as a security threat, Brazilian regulators and telecom firms consider Huawei as an opportunity to bridge the digital divide. This paper builds on primary data collected from 40 semi-structured interviews with local stakeholders in 2023, secondary data from relevant government policies, rules, and regulations, and government publications, local newspapers, and scholarly publications.

THE GEOPOLITICAL HEADWINDS

Long before former President Donald J. Trump initiated a bitter trade war with China, U.S. authorities closely scrutinized Huawei activities.[10] Huawei's troubles in the United States can be traced back to the early 2000s after it started competing with U.S. router firms. In 2003, router maker Cisco accused Huawei of intellectual property theft and later dropped the suit. In 2008, Huawei's efforts to take a 16 percent stake in 3Com collapsed amid lawmakers' concerns about the firm's possible ties to the Chinese military. The fact that Huawei's Founder and CEO Ren Zhengfei had served in the People's Liberation Army for nine years (1974-1983) heightened such concerns.[11] In 2012, the United States House Permanent Select Committee on Intelligence issued a scathing report on Huawei and ZTE, warning that the companies' ties to Beijing could pose a national security threat to the United States.[12] In 2016, the U.S. Department of Commerce and the Department of the Treasury separately subpoenaed Huawei as part of an investigation into whether it violated U.S. export controls.

As tensions between the United States and China grew after Trump took office in 2017, actions against Huawei were_fast and furious. In April 2017, a grand jury subpoena was issued to the U.S. subsidiary of Huawei, signaling that the probe into the firm had turned criminal.[13] In 2018, the National Defense Authorization Act barred government agencies from buying equipment or services from Huawei and ZTE. A more dramatic turn of events was the arrest of Meng Wanzhou, Huawei's chief financial officer and the daughter of its founder, Ren Zhengfei, in Canada on December 1, 2018. The arrest was made at the request of U.S. law enforcement on suspicion of Huawei violating trade sanctions on Iran. In a rare public appearance following the arrest of his daughter, Ren said his company had never spied for the Chinese government. He contended, "No law requires any company in China to install mandatory back doors…I personally would never harm the interest of my customers and me, and my company would not answer to such requests."[14]

Nevertheless, top officials in the Trump administration pointed to China's 2017 National Intelligence Law that required Huawei and other companies to provide information to intelligence officials in Beijing. They argued that the Chinese government could use Huawei to spy on companies, individuals, and governments—an accusation Huawei has vehemently denied. In May 2019, the U.S. Department of Commerce's Bureau of Industry and Security put Huawei on the "entity list", which means that U.S. companies need to obtain a license from the government to export or transfer certain technologies and goods to Huawei.[15] Subsequently, Google terminated Huawei's license to its Android mobile operating system, which powered all phones sold by Huawei.[16] Google's ban, known as the "death penalty" within the U.S. government, dealt a heavy blow to Huawei, the world's second-largest smartphone maker at that time.[17] Without access to Google's email and application (app) universe, Huawei's smartphones could become expensive "dumbphones" and lose their appeal to potential overseas customers.[18]

Huawei filed a lawsuit against the U.S. government in 2019, arguing that the 2018 defense bill unfairly banned only Huawei and ZTE, while other companies that manufactured their equipment in China were not affected. It also alleged that the ban violated the U.S. Constitution's separation of powers and the company's right to due process. To defend its reputation, Huawei challenged the U.S. government to provide evidence of its suspicions.[19]

Yet, what followed was a more devastating blow to Huawei—the chip ban. In May 2020, the Trump administration adopted a tougher line against Huawei by restricting not only the sale of U.S.-produced goods to Huawei but also the sale of any goods made with U.S.-produced technology. Given that nearly every chip in the world uses software from at least one of three U.S.-based companies (Cadence, Synopsys, and Mentor), this move effectively cut off Huawei from the world's entire chipmaking infrastructure, except for chips that the U.S. Department of Commerce gave it a special license to buy.[20] "The United States needs to strangle Huawei," Senator Ben Sasse (R-NE) declared in 2020. "Modern wars are fought with semiconductors and we were letting Huawei use our American designs."[21] In June 2020, the Federal Communications Commission (FCC) formally designated Huawei and ZTE as national security threats, barring U.S. firms from tapping a US$8.3 billion government fund to buy equipment from the companies.[22] Meanwhile, the FCC ordered U.S. carriers to remove Huawei equipment under a federal program called "rip and replace."[23]

In 2018, the Trump administration embarked on a global campaign to prevent countries from using Huawei and other Chinese telecommunications equipment in their 5G networks.[24] According to *The New York Times*, "The administration contends that the world is engaged in a new arms race—one that involves technology, rather than conventional weaponry, but poses just as much danger to America's national security. In an age when the most powerful weapons, short of nuclear arms, are cyber-controlled, whichever country dominates 5G will gain an economic, intelligence and military edge for much of this century."[25] As a result, "American officials have tried to pressure, scold and, increasingly, threaten other nations that are considering using Huawei in building 5G wireless networks. Then-Secretary of State Mike Pompeo pledged to withhold intelligence from nations that

continue to use Chinese telecom equipment."[26] The U.S. Ambassador to Germany cautioned Berlin in March 2019 that the United States would curtail intelligence sharing if Germany used Huawei.[27] In the case of Poland, Trump officials suggested that future deployment of American troops—including the prospect of a permanent base labeled "Fort Trump"—could hinge on Poland's decision to bar Huawei from its 5G network.[28]

The Biden administration continues to take a tough stance against Huawei and other Chinese tech companies. In late 2021, U.S. President Joseph R. Biden signed the Secure Equipment Act, which prohibits Huawei, ZTE, and three other Chinese companies from supplying equipment to U.S. telecom networks.[29] In January 2023, the U.S. government moved toward a total ban on the sale of U.S. technology to Huawei. As discussed earlier, during the Trump administration, Huawei was put on the "Entity List," however, licenses were issued to some U.S. companies, including Intel and Qualcomm, to supply Huawei with technology unrelated to 5G.[30] The Biden administration further tightened policy on Huawei by not approving licenses for U.S. firms to export most items to the Chinese telecom equipment giant, including 4G items, Wi-Fi 6 and 7, artificial intelligence, and high-performance computing and cloud items.[31]

The crippling U.S. sanctions forced Huawei to divest part of its smartphone and server businesses due to the lack of necessary chips. Its revenue plunged by 28.6 percent from renminbi (RMB) 891 billion (US$128.2 billion) in 2020 to RMB 636.8 billion (US$91.6 billion) in 2021.[32] Yet the Shenzhen-based conglomerate, once fighting for its survival, stabilized in 2022 with a revenue of RMB652 billion (US$92 billion) and surprisingly rebounded with nearly RMB700 billion (US$100 billion) in revenue in 2023.[33] One of the main reasons for Huawei's comeback is its strong presence in the Global South. While the U.S.-led campaign made headway in building alliances with many developed countries to block Huawei (e.g., Canada, Germany, Japan, and the United Kingdom), it suffered a setback in recruiting developing countries, such as Brazil, the largest economy in Latin America.

BOLSONARO AND HUAWEI

Jair Bolsonaro, a former army captain, rode to the Brazilian presidency in 2019 with a brash, antiestablishment campaign modeled on Trump's 2016 run. Nicknamed "Trump of the Tropics," Bolsonaro moved Brazil closer to the United States, marking a distinct change in Brazil's diplomatic priorities after more than a decade of leftist party rule that sometimes clashed with U.S. interests.[34] During Bolsonaro's visit to the White House in March 2019, Trump promised he would designate Brazil a major non-NATO ally, a status upgrade that gives a country preferential access to the purchase of U.S. military equipment and technology.[35] As later confirmed by the Brazilian vice-president, Bolsonaro was asked by Trump to stop Huawei from developing new mobile networks in Brazil during his visit to Washington.[36]

Following closely with Trump's sanctions on Huawei, Bolsonaro opposed the tech giant on the grounds that it shared confidential data with the Chinese government. Meanwhile, Brazil received increasing pressure from the United States to ban Huawei. On August 19, 2020, Keith Krach, Under Secretary for Economic Growth, Energy Security, and the Environment in the Trump administration, published an article on the Brazil-based U.S. Embassy website. In the article, he warned:

> Huawei is the backbone of China's worldwide surveillance state. It presents itself as a private and independent company, yet it must abide by China's National Intelligence Law by turning over private citizen and business data to the Chinese government upon request. This means any nation that trusts Huawei with its communications networks gives the Chinese government a key that can unlock the door to any data that crosses those networks, including text messages, intellectual property, and sensitive business and government communications.[37]

During a visit to Brazil three months later, in November 2020, Krach called Huawei an industry pariah that should be locked out of 5G networks. "The Chinese Communist Party cannot be trusted with our most sensitive data and intellectual property," he said in a November 11 speech in Brazil. He argued that

"free nations" needed to coalesce around a "clean network" that excluded Huawei because "our chain of security is only as strong as its weakest link."[38] Shortly after Krach's visit, Brasilia declared support for the Clean Network, a U.S. initiative to get countries on board in preventing the worldwide growth of Chinese technology in 5G networks.[39] In December 2020, Bolsonaro's government was looking for a legal way to exclude Huawei from 5G networks in Brazil, including using a presidential decree.[40] Bolsonaro's National Security Adviser Augusto Heleno and the Ministry of Communications were looking at security provisions that telecoms and their suppliers must comply with. Yet they failed to find a way to ban Huawei that legally held water without affecting other suppliers.[41]

In December 2020, the U.S. government offered Brazilian telecom firms funding to encourage them to buy from Western providers such as Nokia and Ericsson instead of Huawei.[42] The Biden administration continued this strategy. On his high-level visit to Brazil in August 2021, U.S. National Security Advisor Jake Sullivan raised concerns about Huawei equipment in Brazil's 5G network. During his meeting with Brazil's Communications Minister Fabio Faria, Sullivan discussed building 5G networks in Brazil using the U.S. Open RAN technologies. Sullivan offered Brazil the chance to become a NATO global partner in exchange for removing Huawei from its 5G network.[43] According to the National Security Council's Senior Director for the Western Hemisphere, Juan Gonzalez, Huawei was facing "major challenges" to its semiconductor supply chain that would leave international customers "high and dry."[44] However, Brazil made no promises about whether it would use products from Huawei; Brazilian telecom companies had already built networks largely with Chinese components.

THE LACK OF POLITICAL CONSENSUS ON BANNING HUAWEI IN BRAZIL

Although Bolsonaro was keen to exclude Huawei from Brazil's 5G network, he faced fierce resistance from the industry and within his government, including his Vice President, Hamilton Mourao. In a 2019 interview with Reuters, Mourao said his country would not ban Huawei from operating its 5G network despite requests to do so from Trump.[45] He also noted that when it comes to doing business with China, a key trading partner, Brazil's position is "pragmatic and flexible."[46] At the same time, Mourao said Brazil "can't miss out on the 5G opportunity," and the government would not interfere with Huawei's activities—"as long as the firm creates local jobs and plays by its rules."[47] However, his comments were not well received by Bolsonaro and his communications minister. The very next day, Bolsonaro said he was "not open to talking about 5G with anyone who hasn't consulted with [communications minister] Fabio Faria first."[48] Faria also dismissed Mourao's comments, stressing that "[Faria], along with the president, have the upper hand on the subject."[49]

Faria also met with representatives of the five main telecom operators in Brazil—Vivo, Claro, Oi, TIM, and Algar Telecom to address the companies' concerns and what he described as disinformation and untrue rumors. He used the occasion to reiterate that 5G was to be discussed exclusively by Bolsonaro and the Communications Ministry.[50] Meanwhile, Brazil's telecom sector voiced concerns over the government's possible ban on Huawei. Without citing Huawei directly, Conexis Brasil Digital, the Brazilian trade body representing the telecommunications companies, said in a statement, "This uncertain environment can impact the sector's performance, given that restrictions may lead to potential cost imbalances and delays in the [5G roll-out] process, impacting the population directly."[51] The trade union added "that pricing, global scale and innovation delivered by vendors currently present in Brazil are crucial factors for operators in ensuring service delivery at a competitive cost to consumers."[52]

Relatedly, Brazil's top four telecom companies snubbed Krach by declining the invitation to meet with him in Sao Paulo in November 2020. Each of the four telecom companies (Vivo, Claro, Oi, and Tim) controlled between 19 percent and 29 percent of Brazil's wireless market. They had already tested Huawei equipment before the 2021 auctioning of spectrum concessions and did not support the ban on Huawei sought by the U.S. government.[53] They declined to meet with Krach because the invitation was "not compatible with free-market choices."[54] As discussed above, after Krach met with Brazilian foreign ministry officials in November 2020, the Brazilian government backed America's Clean Network proposal to build a global digital alliance that would exclude Huawei telecommunications equipment. According to a subsequent joint U.S.-Brazil statement, "Brazil supports the principles contained in the Clean Network proposal made by the United States," and the initiative is "aimed at promoting, in the context of 5G and other new technologies, a safe and transparent environment compatible with democratic values and fundamental freedoms."[55] The stance of Brazil's top four telecom companies on the Huawei ban offers a glimpse of the deep cleavage between the Bolsonaro administration and the telecommunications industry.

The political divide within the Brazilian government and the enormous complexity of Brazil's domestic political system were another roadblock for Bolsonaro to implement the Huawei ban. The shift in the military's clout and influence in early 2019 further weakened Bolsonaro's power. The military composed a third of Bolsonaro's cabinet and was more powerful during Bolsonaro's era than at any moment since the 1964-85 dictatorship.[56] Headed by Mourao and the (even more powerful) retired General Augusto Heleno, this group was pragmatic on foreign policy.[57]

Brazil's policymaking process was characterized by fragmentation. According to Fernanda Magnotta, a professor at Fundação Armando Alvares Penteado, there were five influential groups in the Bolsonaro government, neatly summed up as 5Bs—Bullets (representing the military and pro-guns group), Bois (beef, the pragmatic agribusiness group), Bible (evangelicals, the more conservative religious group), Bolsonaro (representing a small, ideologically-driven group that follows Trumpism), and Bovespa (the pragmatic financial sector).[58] When it came to issues related to China, the pragmatic approach of the Bullets, Bois, and Bovespa clashed with Bolsonaro's ideologically-driven approach. Representatives from Brazil's powerful agribusiness and financial sectors sent a clear message to Bolsonaro that they did not want to mess with China, the country's biggest trading partner.[59] Bolsonaro's low popularity, already down to 37 percent in early 2019—lower than any of his predecessors at a similar stage since full democracy returned in 1989—did not help his ability to push through any policy changes.[60]

Facing the threat of being potentially banned from the Brazilian market, Huawei took matters into its own hands. To secure its position in Brazil's 5G market, Huawei hired former Brazilian President Michel Temer as an advisor in early 2021 as the auction of 5G wireless networks approached.[61] Temer, a constitutional law professor and lawyer, was Dilma Rousseff's vice president, became head of state after Rousseff's impeachment in 2016, and remained in office until 2018. Temer was a political heavyweight in Brazil. His proximity to Bolsonaro, besides his legal advice on the implementation of 5G in Brazil, was particularly valuable to the Chinese firm. In addition, Temer had a network of allies in Brazil's Congress. He was responsible for the appointment of the president of the board of the Brazilian telecommunications agency Anatel, Leonardo Euler de Morais, who stayed in office until November 2021. Huawei's influence in domestic Brazilian politics has made it even more challenging to ban its technology.

PROHIBITIVE COSTS OF BANNING HUAWEI

Huawei has been operating in Brazil for over 20 years. Most Brazilian telecommunication providers use Huawei equipment on their 3G and 4G networks. According to a study, the largest cellphone company, Vivo (owned by Telefônica Brasil), uses Huawei equipment in 65 percent of its networks. In comparison, 55 percent of Claro's equipment is from Huawei, while Oi has 60 percent, and TIM has 45 percent.[62] It would have cost these companies billions of dollars to remove Huawei equipment from their 3G and 4G networks. As such, Brazil's telecom companies insisted on a free market and were reluctant to exclude Huawei from their options.

Huawei's competitive advantage offers more than low costs. It provides unrivaled customer service and rapid troubleshooting ability. According to a Huawei staff consultant interviewed by Parsifal D'Sola of the Colombia-based Andrés Bello Foundation, "Troubleshooting is something that must be highlighted, it's great, it's very fast. If hardware malfunctions, they quickly replace it. Something that might take a month (with other vendors), they would solve within a week." In addition, Huawei offers favorable financing terms. According to a high-level official at Anatel, the regulatory agency responsible for approving products used in Brazil's telecommunications sector, Huawei would provide internet service providers with its telecommunication equipment for zero down payment, and its customers could pay after they start to collect revenue.[64] This financial arrangement has been especially attractive to small internet service providers who could not afford to spend a large sum upfront.

Huawei's equipment costs, on average, 30 percent less than its competitors. Brazil's 5G network would cost significantly more if Huawei were banned. At an industry event held by the São Paulo Trade Association on December 7, 2020, Mourao issued a warning, "If Huawei cannot supply the [5G] equipment, the cost will be a lot higher," adding that in the event of an infrastructure review, the additional cost would be passed onto consumers.[65]

If Brazil banned Huawei, the broad economic and political costs could be prohibitive, as China has been the country's biggest trading partner since 2009. Over the past 20 years, trade integration between China and Brazil has increased tremendously, with bilateral trade amounting to US$150 billion in 2022, a 37-fold increase compared with trade in 2001.[66] Since 2009, China has been absorbing about 27 percent (vs. 11 percent for the United States) of Brazil's exports. Ninety-six percent of Brazil's exports to China are commodity-based (raw materials or resource-based manufactured products). For example, China is Brazil's top buyer of soybeans (69 percent of exports), iron ore (61 percent), wood pulp (41 percent), oil (37 percent), meat (36 percent), and sugar (15 percent), according to 2021 data from the U.S. International Trade Commission.[67] China is also Brazil's main source of imports (22.3 percent) ahead of the United States (18 percent) and Argentina (5 percent).[68]

Losing China's export market would devastate Brazil's agribusiness sector and overall economy. In 2022, roughly one-third of Brazil's agribusiness exports were China-bound.[69] Unlike the chronic trade deficits it had with the United States, Brazil has enjoyed a steady trade surplus increase with China in the past 20 years, from US$527 million in 2001 to US$36 billion in 2021.[70] Its trade surplus with China has been critically important to Brazil as the country's economy has been in recession since 2014. One high-level executive at a Sao Paulo consultancy firm put it bluntly, "Brazil would not be able to survive without China."[71]

Under the Luiz Inácio Lula da Silva and Rousseff administrations (2003-2016), Brazil not only welcomed Chinese investment but also saw Beijing as a more desirable ally than any developed country. Although Lula blocked big land acquisitions by Chinese and other foreign investors, the Workers' Party's foreign policy viewed China as a valuable ally in building an alliance among the countries in the Global South.[72] When Bolsonaro came to office in 2019, the cozy bilateral relationship between Brazil and China began to change. Bolsonaro talked tough on China during his campaign. Portraying China as a predatory economic power, he repeatedly warned, "China is not buying in Brazil; it is buying Brazil." His China-bashing rhetoric chilled a profitable economic relationship that had benefited both countries. Direct Chinese investment in Brazil fell from $11.3 billion in 2017 to $2.8 billion in 2018.[73]

BRAZIL'S PRIORITY OF DEVELOPMENT OVER SECURITY CONCERNS

The COVID-19 pandemic has laid bare the egregious digital divide in LAC: less than half the households (45.5 percent) have fixed broadband access, compared to 87 percent in Western Europe, 57 percent in Eastern Europe, and 59 percent in the Asia Pacific region.[74] The urban bias further amplified the gap in digital connectivity. Whereas 67 percent of LAC households are connected in urban areas, the figure is only 23 percent in rural areas.[75] The digital divide has been a major barrier to economic growth and development in the education, health, and financial sectors. Facing a stagnation "worse than the 1980s,"[76] political leaders in the LAC region are acutely aware that investing in digital infrastructure is essential for them to leapfrog into a highly coveted digital economy. The need to bridge the digital divide in the region is greater than ever, but the U.S.-China technology competition is complicating the efforts. How to bridge the digital divide in LAC countries is not simply a technical issue but involves cybersecurity risks and geopolitical maneuvering.

Brazil has been in dire need of economic development after its economy went into recession in 2014, partly due to declining commodity prices, political instability, and corruption scandals. The impeachment of President Dilma Rousseff in 2016, followed by the arrest of Lula da Silva in 2018, decreased confidence in Brazil's economy and government. The net inflows of foreign direct investment (FDI) declined from US$102.43 billion in 2011 to US$69.17 billion in 2019.[77] The onset of the global pandemic made things even worse. The net inflows of FDI plummeted to 37.79 billion U.S. dollars in 2020.[78] The pandemic also brought about a hunger epidemic, leaving tens of millions of Brazilians hungry. According to *The New York Times*, about 19 million people went hungry in Brazil in 2020—nearly twice the 10 million who did so in 2018, the most recent year data was available.[79] In 2020, about 117 million people, or roughly 55 percent of the country's population, faced food insecurity, with uncertain access to adequate nutrition—a leap from the 85 million who did so two years prior.[80]

Faced with deepened poverty and hunger, many Brazilian policymakers gravitated toward a pragmatic approach and prioritized economic development. As Mourao pointed out, "We are a country that needs to be more digitally integrated. You only need to be 50 kilometers away from Brasilia [Brazil's capital] to lose your phone signal."[81]

To Brazilian policymakers in the tech sector, the national security risks can barely be mitigated without indigenous 5G technologies. They are equally vulnerable to data collection and the threat of choke points whether they choose China's Huawei, Finland's Nokia, or Sweden's Ericsson. A long-time professional who used to work for Claro (one of the largest telecommunications providers in Brazil) put it bluntly:

> Do you want to be spied on by the U.S. or China? Without homegrown technology, there is always a risk of being spied. The Snowden revelation shows that the US spied on our President Dilma Rouseff's phone … We do not have secrets to hide. We Brazilians do not care about national security. We are pragmatic people. We will use whichever company that offers cheaper products or services.[82]

The lack of concrete evidence on Huawei's security breaches made it difficult to justify a ban on the Chinese tech giant. According to Parsifal D'Sola, who interviewed seven telecommunications professionals who work or have worked for Huawei in LAC:[83]

> When it comes to hardware security breaches such as data leaks, back doors, or sabotage, it must be highlighted that the interviews did not bring to light any evidence or suspicion of wrongdoing by Huawei. Between all the interviewees, they add up to 46 years working for Huawei in 11 different countries. Furthermore, of the seven interviewees, five described their overall experience working for Huawei as negative or very negative, minimizing a potential positive bias as former or current Huawei employees. The fact that there is no indication whatsoever of wrongdoing speaks well of Huawei's equipment and services in the region.

An interview with a high-level official at Brazil's telecom regulator, Anatel, confirmed D'Sola's findings. When a U.S. official tried to convince Brazilian officials of the national security threats posed by Huawei, the high-level Brazilian official asked the U.S. official to present evidence of Huawei's wrongdoings. The U.S. official answered, "It is classified information. I cannot share it with you." The Brazilian official responded, "We will take measures if we find problems with Huawei."[84]

CHINA'S VACCINE DIPLOMACY

In November 2020, the Brazilian government backed America's Clean Network proposal to exclude Huawei from its telecommunications networks. Bolsonaro's son, an influential member of Congress, vowed to create a secure 5G system "without Chinese espionage." Yet, a few months later, a complete reversal occurred. On January 16, 2021, Brazil's government announced it would not seek to bar Huawei from 5G network auctions slated for June 2021.[85] This 180-degree policy shift caught U.S. policymakers off guard. What caused Bolsonaro to backtrack on his opposition to Huawei? Possible explanations include the financial costs potentially worth billions to replace Huawei equipment in Brazil's current 3G and 4G network and the exit of ally Trump from the White House.[86] Some studies point to China's vaccine diplomacy as the direct cause of Brazil's policy shift.[87] According to MAJ Neil Law, "It is plausible that Brazil's receipt of COVID vaccines from China was contingent upon their acceptance of Huawei's involvement."[88] A close examination of the role China's vaccine diplomacy played in the Brazilian government's sudden change of heart is therefore warranted.

The COVID pandemic took a devastating toll in Brazil. By March 2021, Brazil's deaths from the virus exceeded 270,000, the second-highest toll in the world after the United States.[89] As Brazil was desperate for vaccines, rich countries, including the United States, were hoarding millions of doses for themselves. China's ability to mass produce vaccines and ship them to countries in the developing world offered Beijing a window of opportunity to dispel resentment and distrust as the place where the pandemic began and brand itself a global health leader.

Bolsonaro initially disparaged the Chinese vaccine while it was undergoing clinical trials in Brazil and shut down an effort by his health ministry to order 45 million doses from China.[90] "The Brazilian people WON'T BE ANYONE'S GUINEA PIG," he wrote on X, formerly known as Twitter.[91] However, as Brazilian hospitals were overwhelmed by a surge of infections, his attitudes toward China and Chinese vaccines drastically changed. The Bolsonaro administration scrambled to make peace with the Chinese to request them to expedite the shipments of tens of millions of vaccines and the ingredients to mass produce the shots in Brazil.[92] The president, his son, and the foreign minister abruptly stopped criticizing China, as cabinet officials worked furiously to approve new vaccine shipments.

On December 21, 2020, Brazilian health regulator Anvisa certified the production standards of CoronaVac, China's Sinovac-produced vaccine, which was being tested in Brazil.[93] According to *Folha de S. Paulo*, Brazil's government adopted a more friendly tone regarding Huawei's participation in a 5G coverage spectrum sale in the country.[94] On January 25, 2021, the Chinese Ambassador to Brazil, Yang Wanming, sent a letter to Brazilian Minister of Health Eduardo Pazuello confirming the export of CoronaVac manufacturing inputs to Brazil.[95] Bolsonaro released the letter the following day. On February 25, 2021, Brazil's telecom regulator, Anatel, approved rules for a spectrum auction for 5G networks without any curbs on Huawei as an equipment supplier.

During a meeting between Brazil's Communications Minister Fábio Faria and Huawei executives at their Beijing headquarters in February 2021, the minister made a very unusual request of a telecommunication company. According to him, "I took advantage of the trip to ask for vaccines, which is what everyone is clamoring for."[96] With the coveted 5G contracts at stake, Huawei was mounting a well-timed charm offensive in Brazil by supplying hospitals with software to help doctors on the front lines of the pandemic and donating 20 oxygen-making machines to the city of Manaus, where COVID patients suffocated to death as hospitals ran out of oxygen.[97]

While the precise connections between Brazil's vaccine request and Huawei's inclusion in the country's 5G auction are unclear, the coincidence of the vaccine negotiations and the Huawei negotiations is striking. China's vaccine diplomacy appeared to have ended Brazil's hawkish stance on Huawei and gave the Chinese tech giant the green light to participate in Brazil's 5G auction.[98] But as this paper demonstrates, the reasons for Brazil to keep Huawei include not only China's vaccine diplomacy but also the prohibitive costs of replacing it, the lack of political consensus to ban the company, and Brazil's priority of development over security concerns. China's vaccine diplomacy was a contingent factor, catalyzing a dramatic policy shift in Brazil.

BRAZIL'S COMPROMISE

According to the Brazilian officials interviewed in 2023, Brazil planned to build two 5G networks—a secure 5G network for government agencies without Huawei equipment and a public 5G network for nongovernment agencies with Huawei equipment. The government's private network is much smaller and does not significantly affect Huawei's market share in Brazil. However, IT professionals and scholars expressed skepticism over the plan's feasibility. Building two separate 5G networks would be costly, and it is technically very difficult to keep them separate. But for the time being, it is a satisfactory political compromise acceptable to both China and the United States.

CONCLUSION

China's digital footprint has expanded rapidly in Latin America in the last two decades. Neither the U.S.-China tech war nor the U.S.-led global campaign aimed at Chinese tech firms could reverse the trend. Employing a case study of Huawei's expansion in Brazil, this paper argues that the lack of political consensus on banning Huawei, the prohibitive costs of replacing it, Brazil's priority of development over security concerns, and China's vaccine diplomacy enabled the Chinese tech giant to gain a firm foothold in Brazil. Instead of perceiving Chinese technologies as a security threat, major Brazilian regulators and internet service providers considered it an opportunity to bridge the digital divide.

The story of Huawei's expansion in Brazil offers important lessons for U.S. policymakers. The United States can take several steps to compete with Chinese tech firms in Latin America and, more broadly, in the Global South. First, LAC countries have different concerns and priorities than the United States. U.S. policymakers need to situate themselves in the context of Latin America and view China's tech firms from the perspectives of their regional counterparts. This will enable U.S. officials to better align U.S. national interests with those of LAC countries.
Latin American countries face an egregious digital divide: Only 45.5 percent of Latin American households have broadband access. The pandemic had made the region's public and policymakers acutely aware of the urgent need to bridge the connectivity gap when millions of school children missed educational opportunities in the absence of in-person classes, patients could not access telehealth services without the internet, and people, particularly migrants and people in slums and rural areas, struggled to work remotely.

Having reliable and affordable broadband internet access and devices like tablets, smartphones, and computers is no longer a luxury but a necessity. COVID-19 has spurred government action to address the region's digital divide. A law passed in Colombia in July 2021 declared the internet an "essential public service," obligating telecom providers to guarantee customers' internet service and provide minimum browsing and free text packages during health and other emergencies.[99] As Colombia President Ivan Duque said, "its importance and necessity for Colombians is comparable to that of water, electricity, and gas."[100] Similar laws were passed in Chile and Argentina, while Peru, Brazil, and Argentina were considering legislation that would make the internet an essential public service.[101] Yet, Latin America's telecom firms view expanding internet access in rural areas as too risky and costly. According to tech entrepreneur Charvel Chedraui, who founded the internet service provider start-up Wayru, investing in internet infrastructure, such as fiber optic cables, antennae, and cell towers with 5G, is rarely profitable.[102] "If governments don't put the infrastructure and funding in place, then it's just talk," said Chedraui.[103]

The pandemic hit Latin America's economies hard, and it is a tall order for their governments to provide sufficient funding to address the digital divide. Providing internet access to all citizens and economic development are regional priorities. Security concerns, the central component in the U.S.-led campaign against Chinese tech firms, may not resonate with most LAC policymakers. The Snowden revelation mentioned earlier further undermined the credibility of any claim that non-Chinese technology or equipment is more secure.

The story of Huawei's expansion in Brazil may be similar in other countries and other issue areas. It could be Chinese companies building a dam in Laos, constructing a high-speed rail in Indonesia, or building solar and wind farms in Argentina. A major reason for Chinese firms to make inroads into these markets is so the Chinese government and firms could provide solutions to the development problems these countries struggle with. U.S. policymakers must shift their focus to development issues confronting developing countries and provide feasible alternatives to counter the global expansion of Chinese economic and political influence. As much of the Global South faces infrastructure deficits and digital divides, the U.S. government could strengthen its global leadership by providing developing countries with the proverbial ladder of prosperity.

Second, U.S. policymakers should invest in a viable alternative to China's 5G technology and equipment. Larry Summers, former U.S. Secretary of the Treasury, posted on X on April 14, 2023, "Somebody from a developing country said to me, 'what we get from China is an airport. What we get from the United States is a lecture.'"[104] When addressing the expansion of China's tech firms in LAC, U.S. policymakers would be better off if they could shift their focus from lecturing their counterparts about Huawei's 5G technology's security threats to offering a viable alternative to digital development. Many LAC countries haven't deployed 5G yet, but one recent report suggests the region will have 42 percent 5G coverage by 2028.[105]

This ambitious goal presents a range of opportunities for the United States in the next few years. Instead of competing with Huawei or Nordic giants Ericsson and Nokia in a predominantly end-to-end telecom market, the United States can reinvent the game. U.S. policymakers should invest resources to make Open RAN (radio access network) a viable and comparable alternative. As described by CISCO, Open RAN is a nonproprietary version of the RAN system that allows interoperation between cellular network equipment provided by different vendors. The future goal for Open RAN is for any hardware and software in the cellular network to interoperate seamlessly and securely regardless of its originating vendor.[106] However, Open RAN is not as mature as the proprietary, vertically integrated network vendors. Although in 2020, a bipartisan group of prominent U.S. senators proposed investing US$1 billion into Open RAN to address security concerns with Huawei, that figure represents just 4 percent of what Ericsson, Huawei, and Nokia collectively spent on R&D in 2018 alone.[107] In addition, to make Open RAN a viable alternative, the United States needs an equipment vendor that can mass produce RAN subcomponents at a competitive cost (e.g., cheaper, lighter, and energy-efficient radios) to meet market demands.[108]

Despite some limitations, Open RAN can be part of a broader set of steps necessary for the United States to shape a robust and secure telecommunications ecosystem. U.S. policymakers should redirect resources to the research and development of Open RAN and enable the mass production of its subcomponents at a lower cost. According to a Wilson Center report authored by Melissa Griffith, "while no single U.S. company can compete (at scale) in a predominantly end-to-end telecom market, U.S. companies can more readily compete in a modular market. Rather than attempting to beat Huawei at its own game, Open RAN changes the game altogether to allow the United States to play to existing industry strengths."[109] Open RAN technology is increasingly viewed as an affordable and customizable 5G networking alternative to Huawei, Ericsson, and Nokia. U.S. policymakers should discuss the benefits and limitations of Open RAN with policymakers in LAC countries and encourage the latter to adopt it in their 5G networks.

Third, U.S. policymakers should build a multilevel alliance with policymakers and professionals from developing countries. U.S. diplomacy needs to move from the federal and central to the local and sectoral levels. As the Brazilian case study shows, despite Bolsonaro's determination to follow the U.S. lead, he could not single-handedly ban Huawei without the broad support of government officials at the federal and regional levels and the telecommunications sector. Effective communications with local stakeholders and concrete assistance programs to LAC countries should work in tandem.

Fourth, to counter China's influence in Brazil, U.S. policymakers need to expand the emphasis beyond technology and devise a comprehensive and nuanced strategy, including trade, foreign direct investment, foreign aid, and cooperation in education, health, energy transition, and climate change. This study shows that China has overtaken the United States as Brazil's largest trading partner since 2009. Brazil's resistance to a Huawei ban is partly due to its concern over losing China's export market and the devastating effects on Brazil's agribusiness and overall economy. China's vaccine diplomacy further strengthened Huawei's foothold in Brazil. As such, China's tech giant has enormous leverage over its competitors in Brazil, which goes beyond its affordable 5G technology and equipment. U.S. policymakers should explore ways to increase trade in goods and services with Brazil, thus reducing Brazil's trade dependence on China. The U.S. government should encourage private investment in Brazil to create jobs and generate economic prosperity for both countries. Long-established health cooperation between the United States and Brazil has helped both countries address urgent health challenges, such as HIV/AIDS, ZIKA, and COVID-19.[110]

Building on past successes, the United States and Brazil could partner on research and development to tackle major public health concerns in both countries. In other words, mutual benefits from bilateral cooperation in a wide array of fields will help strengthen ties between the United States and Brazil.

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